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Electric Railway Journal

Volume 70

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Getting the Most from the Index

This year a change has been made in the indexing of articles relating to maintenance practice and equipment. The large number of articles brought out on the monthly maintenance data sheets, together with the increasing number of maintenance notes in other issues, seemed to make such a change desirable. Three new keywords have been introduced: (1) Maintenance data, under which all articles appearing on the monthly maintenance data sheets are grouped; (2) Maintenance equipment, with classified subheads, under which all articles in the weekly department "New Equipment" are included, and (3) Maintenance practice, also with classified subheads, under which all articles in the weekly department "Maintenance Notes," as well as the articles on the data sheets, are inserted. In view of this change, the heading "Repair Shop Practice" has been reserved in this index only for general articles on repair shop methods, and the heading "Repair Shops and Equipment" for general articles on the design of repair shops and their equipment.

Otherwise the plan used for many years in the preparation of this index has been followed. It is essentially a subject index, not an index of titles, and articles treating a number of different subjects are listed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about an electric railway are under the name of the city in which the main office of the company is located.

In the subject index, the alphabetical method is followed. If there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. The headings which appear in the index itself are in small type under the general classifications. The main headings in capitals below do not appear in the index.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question.

In addition to the groups of articles covered by these headings, papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed.

Signed articles also are indexed by the name of the author. When the name of the author is known to the reader this provides the simplest method of locating any article.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION
Accident claim department
Accident prevention
Accidents (including wrecks)
Insurance, Fire
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS
Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT
Bearings
Brakes and compressors
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Resistors
Seats
Trolley wheels
Trucks
Wheels and axles

EMPLOYEES
Education
Employees
Insurance and pensions
Labor
Strikes and arbitrations
Wage decreases
Wage increases
Wages and working agreements

FARES
Fare collection (including apparatus)
Fare decreases
Fare Increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS
Accounting
Appraisal of railway property
Blanks and forms
Discontinuance of lines
Financial (methods of financing)
Financial reports
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

HEAVY ELECTRIC TRACTION
Heavy electric traction (general)
Locomotives

MAINTENANCE OF EQUIPMENT
Car cleaning
Lubrication
Maintenance data
Maintenance equipment
Maintenance practice
Motor buses, Practice with
Painting
Repair shop practice; cars and car equipment
Repair shop practice; shop methods and equipment
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

MOTOR BUSES
Motor buses, design
Motor buses, gas-electric
Motor buses, field for
Motor buses, installations
Motor buses, jitney competition
Motor buses, operating practice
Motor buses, Practice with
Motor buses, regulation

POWER
Energy checking devices
Energy consumption
Fuels

POWER—Continued
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Power distribution
Power generation
Power stations and equipment
Power transmission
Substations and equipment

STRUCTURES
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Carhouses and storage yards
Loading platforms
Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals and waiting stations

TRACK
Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRANSPORTATION
Advertising
Customer ownership
Dispatching
Freight and express
Interurban railways
Merchandising transportation
Parking of cars
Publicity
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Rapid transit (elevated and subway)
Schedules and timetables
Signals
Street traffic congestion
Traffic investigations
Traffic regulation
Traffic stimulation
Transportation, Metropolitan (general studies)

MISCELLANEOUS
European practice
Management
Noise reduction
Railways (general)
Snow and ice removal
Standardization
Wood preservation

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Abbreviations: *Illustrated. c Communications.

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Abbreviations: *Illustrated. c Communications.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Motor Vehicle Taxes Need Revision

VARIATIONS are so great in the taxes paid by motor vehicles in different states that the need for some revision is clearly indicated. No good reason is evident why the license fee in Missouri for a 20-passenger bus weighing 9,000 lb. should be less than that of a 5-passenger automobile weighing 3,000 lb., while in California the bus license costs 170 times as much as the automobile license. If the relationship between the two tax rates is reasonable in one of these states it must be grossly unfair in the other. The inequalities of the present arrangement were brought out strikingly in an address made by Henry R. Trumbower, professor of economics University of Wisconsin, at the recent convention of the Motor Bus Division of the American Automobile Association. An abstract of his address appears elsewhere in this issue.

Many years ago it was common practice to make the highway users pay for the benefits received. Toll roads were built and operated on this theory. As time went by the viewpoint changed and toll roads began to disappear. Streets and highways were considered as public improvements which should be paid for from general taxation in the same way as schools, etc. Recently another change of opinion has occurred and the motor vehicle, which has become the chief user of the roads, is looked upon as a source of revenue from which to defray a large part of the highway expenses. In 1926 approximately $1,500,000,000 was spent in the United States for construction and maintenance of streets and highways. Motor vehicle revenues collected by the states amounted to about $400,000,000, according to Professor Trumbower.

During the past five years the states have come to rely more and more on the gasoline tax as a source of funds for highway purposes. The number of states levying this tax has not only increased year by year, but the rates themselves have been raised by the states that early adopted the tax. Last year 44 states and the District of Columbia collected gasoline taxes ranging from 1 cent per gallon to 5 cents. Of the $400,000 raised by taxation of motor vehicles, 46 per cent was derived from gasoline taxes and 54 per cent from license fees. Since the beginning of the present year New Jersey has adopted the gasoline tax, and it has come close to adoption in New York, Illinois and Massachusetts, the three other states that were without this form of impost in 1926. From this it appears probable that gasoline taxes will soon become the chief source of revenue derived from motor vehicles.

It is obvious that neither a tax on gasoline nor a flat license fee corresponds accurately with the destructive effect of the operation of the vehicle. The former fails to take into account important factors such as weight, springs and tires, all of which directly affect the wear and tear on the pavement. The latter neglects the mileage covered, which also directly affects the wear. That sufficient scientific study has not been given to these matters is shown by the wide divergence in the methods of taxation now in use.

Records Still Being Made in Pittsburgh

ECONOMIC conditions the past year in Pittsburgh were not good, but despite this the Pittsburgh Railways, the Coffin Prize winner of two years ago, made a most creditable record for the year. Passenger revenue was smaller by $113,998 per cent than in 1925, but the railway succeeded by close supervision, economies and competent labor in effecting a reduction of $137,344 in operating expenses exclusive of taxes. This it did at the same time that it furnished the people of the Pittsburgh territory 1,668,599 more car-miles, carrying 26,000,000 more riders than in 1925, thereby bringing the average fare per ride to 5.37 cents, compared with 6.73 in 1923 and 5.78 in 1925.

Between the lines of the report one reads the reasons why the company was successful in winning the Coffin award, for the document speaks for itself on the relation of the railway with the public, with the employees and with the communities that it serves. It discloses the disposition of the company to do everything within its power adequately to serve the territory in which it operates. This is evidenced tangibly in many ways, but most notably, perhaps, by the fact that last year alone the company placed in operation 50 new cars, bringing the total up to 378 put into service since the railway came out of receivership in 1924. This, of course, takes no account of the vast amount of overhauling and rehabilitation of cars carried out meanwhile.

An activity of the company which deserves particular attention is the operation of buses. At the beginning of the year 22 coaches of various makes and types were owned. During the year nineteen coaches were purchased and seven were sold. The total number of coaches owned at the close of the year was 34, including eight double-deck vehicles. Moreover, coach operation has been successful financially, the net income for the year being $17,093. The base fare for this service is 25 cents. This is a service to which extended reference has been made before in the ELECTRIC RAILWAY JOURNAL, particularly in a paper read at the recent meeting of the C.E.R.A. Rightly enough, the management is pleased with the prospects for bus operation.

Despite all that has been accomplished, many other things remain to be done. Among them the company still has before it the plan of readjustment of the capital structure, the purpose of which is to bring into one consolidated company the ownership of all leased and operated properties so as to simplify the present situa-

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tion. This is one of those arrangements which the committee on finance of the American Electric Railway Association recommended several years ago be carried out to the lasting benefit of the companies involved and the industry as a whole. It would be fulsome, indeed, to commend the work of this company were it not for the benefit of the example of accomplishments it is setting for the rest of the industry.

Cotton May Be King Again

COTTON enters into many of the products consumed by the electric railways. So the industry will do well to keep its eye on cotton. From all accounts it is likely to become king again. During the last few months there has been a remarkable change in the statistical position of this commodity. Prices as quoted by the Guaranty Trust Company of New York reveal that raw cotton at New Orleans advanced in price from an average of 12¼ cents per pound last December to 16½ cents on June 1. Also, that the quotation at the end of 1926 was the lowest for five years and was 7 cents a pound, or 36½ per cent, below the level a year earlier.

Further to gage the situation, one must consider the cotton crop in the light of the visible supply. As far as the United States is concerned, the crop is only a little in excess of that of a year ago. On the other hand, stocks of American cotton in foreign countries are more than twice as large. In addition, there has been a small gain in the supply of foreign cotton. Many authorities interpret this as an indication that foreign manufacturers have taken advantage of the low prices during the current season to build up their stocks of raw material.

Such an opinion was expressed in the Guaranty *Survey* for June, which calls attention to the fact that the size of a crop is by far the most variable factor influencing the movement of cotton prices, "and that the entire cotton situation may be and frequently is radically changed in a very short time by conditions that can neither be controlled nor foreseen." This authority, in commenting on the outlook for the crop, calls attention to the uncertainty occasioned by the Mississippi flood. Private estimates of acreage reduction from last year, it points out, are being roughly averaged as 10 or 11 per cent. There is also the added factor that a late start inevitably exposes the crop to unusual hazards, both from weather and from insects.

It seems timely that a note of warning be sounded with respect to the whole situation. Purchasing agents may well consider the trends when preparing their buying schedules.

There's Much in the Viewpoint

SICKNESS and health depend so often on the frame of mind of the individual that many doctors treat their patients by the power of suggestion, without medicine. On the contrary, if a patient concentrates on his troubles, his physical condition usually becomes worse. The same is true of many electric railways, particularly in the smaller communities. It is in these that automobile competition is at its height, and where in any event it is most difficult to get the public to patronize the service. Naturally the manager is likely to become discouraged. When that happens the problem of the road is greatly magnified, and the attitude of the management soon is reflected in the run-down condition of the property. On a recent trip the writer was confronted with this attitude from a number of managements: "We have done everything we could, but the people will not support us. We have exhausted every means of increasing revenue and cutting expenses. We don't know what to do next." In all these towns the service given was infrequent, the cars and track more or less decrepit, and the employees indifferent. People tolerated the street railway, but looked on it as a poor relation, hardly worthy of help.

How different was the situation in one city! The smallest of the group visited, it was the one where the cars were new and bright. All the track had been rebuilt within recent years, and the headway was the most frequent. The fares were low. What is more, the public patronized the cars. The company was earning a return on the investment, whereas the others were barely making operating expenses. The general manager was busy on the day of the visit, as in his capacity as president of the commercial organization he was arranging for a dinner that evening to boost the city. But he did find time to say, "We have faith in the railway. The public is with us and we are with it. We are not afraid of the automobile. People travel more and we get more business."

Not every manager has the courage, the enthusiasm and the perseverance to do equally well, but the instances of properties that have been able to obtain results like this show that there is the opportunity—even in the smaller cities—to furnish public transportation and to do it at a profit. The discouraged manager can well take stock and see if he really has done everything, or if he has made the mistake of failing to win the confidence and support of his public, for without it he cannot hope to prosper.

What Will Toledo Do About It?

TOLEDO needs new street railway operating conditions. This work has been apparent for months. Despite this the work has been slow of recasting the present grant so as to make the conditions under which the Community Traction Company operates in that city more nearly tenable. The committee that has been drafting the new plan has reported its findings and the matter now goes before the City Council. It is not possible to go into the details of all the changes proposed. They are still too intangible for that. Some of them, however, are made plain in the tenor of the recent accounts of the negotiations.

These negotiations have been followed closely in the ELECTRIC RAILWAY JOURNAL, as has also the matter of the survey of the properties there, but the gravity of the situation in Toledo is perhaps reflected most poignantly by the figures contained in the report of the company for the year ended Dec. 31, 1926. They show that net income from operation in 1926 was $694,344, compared with $838,210 the previous year, and that the net deficit in 1926 was $253,952, compared with $107,090 in 1925. In explaining how the company can continue to operate on a losing basis, acting Street Railway Commissioner Graumlich said that the sinking fund credit should be taken into consideration as offsetting in a measure the deficits accumulated in the stabilizing fund. That loss as reflected in the stabilizing fund was $910,544 at the close of 1926. It covers the entire six years of service-at-cost operation under the so-called

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Milner ordinance. However, during this period the sinking fund accounted for retirement of $1,406,000 of the bonds with some additional cash balance in the fund.

One of the bones of contention in considering the revision of the franchise ordinance is the matter of these sinking fund payments. It appears that the practice has been followed of keeping alive the bonds drawn for redemption. If the proposed changes in the ordinance are correctly interpreted all this would be changed. The burden that this plan imposes is apparent on its face. Agreement with Mr. Graumlich is inescapable that the results of operation at Toledo under the ordinance are *not* satisfactory to the car riders, the citizens or the city generally.

The loss in revenue due to competitive bus service and the high operating costs from duplicated car service and power charges which are conceded to be too high, together with the heavy requirements of the sinking fund, have not left money sufficient for the required maintenance and renewal of the company's property even at a maximum rate of fare and with curtailed service. This is reflected not only in the inability of the company to render satisfactory service, but in its interference with the public improvement program. Expressed concretely, independent buses are estimated to cause a loss of about $250,000 in revenue annually to the railway.

It would be idle to attempt to speculate as to what Toledo will do about the matter, but it does need to do something and do it quickly if the company there is to be able to turn to its own advantage the aggressive policies developed by railways in other cities for winning business. The talent for management which is available on the Toledo properties has been stifled in its efforts through no fault of its own.

Bus Franchises Must Be Secured in Louisville

THERE may or may not be more moves in connection with plans to operate buses in competition with the lines of the Louisville Railway, but such prospective operators will be required to secure proper franchises from the city. This was made plain by a decision of the Court of Appeals, which on June 24 ruled that buses cannot operate there without a franchise. The matter has been pending for months. The decision by the court along the lines indicated will put the railway and any impending competitors on a parity. While the case was under way an injunction preventing the operation of buses by the Louisville Transit Company was permitted to stand. The court ruled that the case did not involve interurban carriers.

Since the Louisville Railway has operated buses in the past it is reasonable to suppose that the company will be willing to supply additional bus service provided only that there is assurance of traffic sufficient to make the lines self-supporting. There can be no question about the reasonableness of an exaction of this kind. Any other procedure would be fallacious. An independent company might be induced to start service, but one or more of several things would happen if operation at the fare fixed originally did not prove profitable. In that event service might deteriorate, fares be increased to a point where there would be a profit or the lines go out of business. Creditors are not disposed to sit idly by and see an enterprise in which they have a stake going from bad to worse. Confronted with a predicament of this kind, they may be loath to act, but when they do act the result of their doing so is spelled in terms of receivership and foreclosure, things that are not pleasant to contemplate.

In the absence of the full text of the decision, the officers of the railway have rightly refrained from comment. It is not too much to say, however, that if the extracts of the finding that are available for publication are exact, the full measure of protection for the railway has been expended to which it is entitled. A condition is untenable in which fish is made of one and flesh of another. That is just what appears to have been done in Louisville under the condition that prompted the bus company to start service merely on the strength of its willingness to pay local vehicle and other taxes. With this the court agreed.

Forbear and Bear With the Exhibit Committee

SPACE assignments for the Cleveland convention were made last week by the exhibit committee of the American Electric Railway Association after an active campaign. This has resulted in the assignment of space to 226 exhibitors representing a call for 108,272 net square feet. With nearly three months to go, this figure represents almost double the square feet assigned at the first exhibit convention in 1916.

The preliminary campaign to make exhibitors understand the need for early space application has been conducted with military precision and that ability for leadership so characteristic of the chairman of the exhibit committee, Col. Joseph H. Alexander, president of the Cleveland Railway. Co-ordination between leader and men was so perfect that at the "zero" hour things went over the top and one of the set objectives of the committee was reached. The main objective, however, in making ready for the display is yet to be obtained, and in so doing the committee still has its problems.

The great growth of this feature of the association's work brings strongly to the fore two points that everyone in the field should bear in mind if the exhibits are to function at their best: First, we have the matter of disappointments that are usually occasioned when the committee struggles manfully to assign one space to perhaps a dozen applicants who have expressed preference for it. The committee at its last meeting made assignments to all members who had applied. In so doing it is anticipated that there will be disappointments and perhaps misunderstandings. No great work that is worth while is free from these preliminaries and it is the JOURNAL'S thought that forbearance and co-operation in this respect will result in the end in everybody being happy and a bigger and finer exhibit than has ever been produced in the history of the association.

The second point that it is well to emphasize centers in the fact that the A.E.R.A. statistics show that attendance increases enormously when an exhibit becomes a part of the annual gathering. It is therefore good business and in the interests of the industry as a whole that those who hesitate to exhibit should be given this convincing proof of their error. It is a rare occasion that presents to the manufacturer such a concentration of buyers within a limited space for a specific period. This is the crux of any well-managed exhibit and it should be the clinching argument to those who have as yet not signed the application blank.

Thus the JOURNAL urges the industry, confronted with these points, to forbear and bear respectively with the committee, that success may crown its splendid work.

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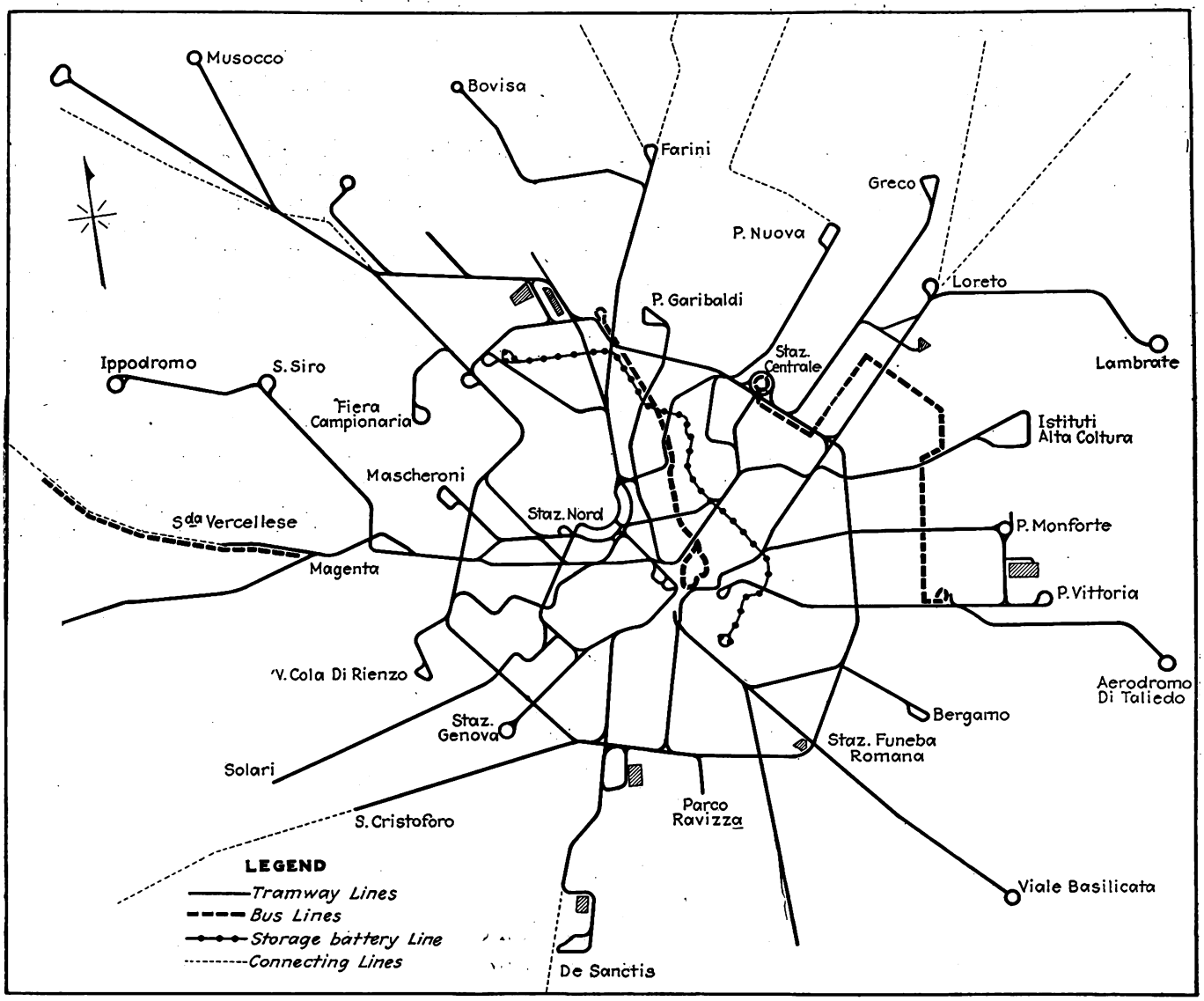
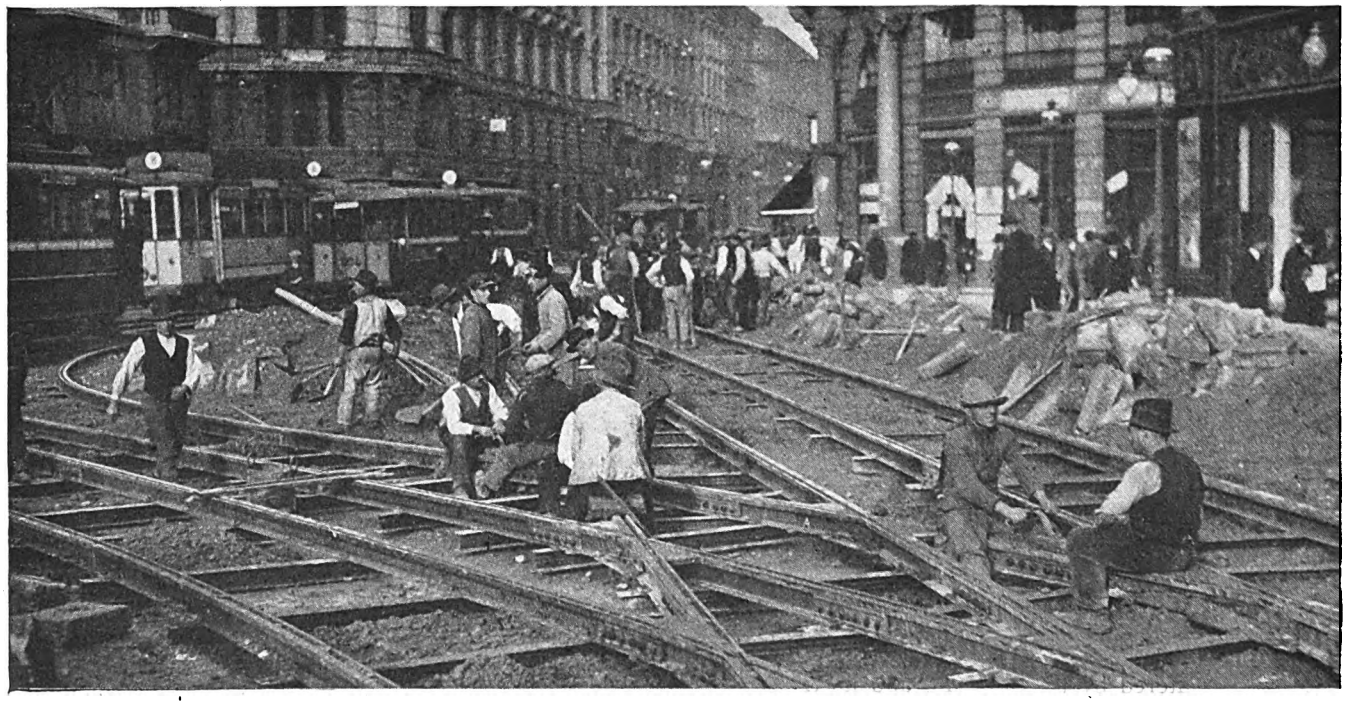


Local transportation facilities in Milan, Italy, include 37 tramway lines, three gasoline bus routes and one electric storage battery line



Installing a piece of complicated special trackwork. Old rails used as ties

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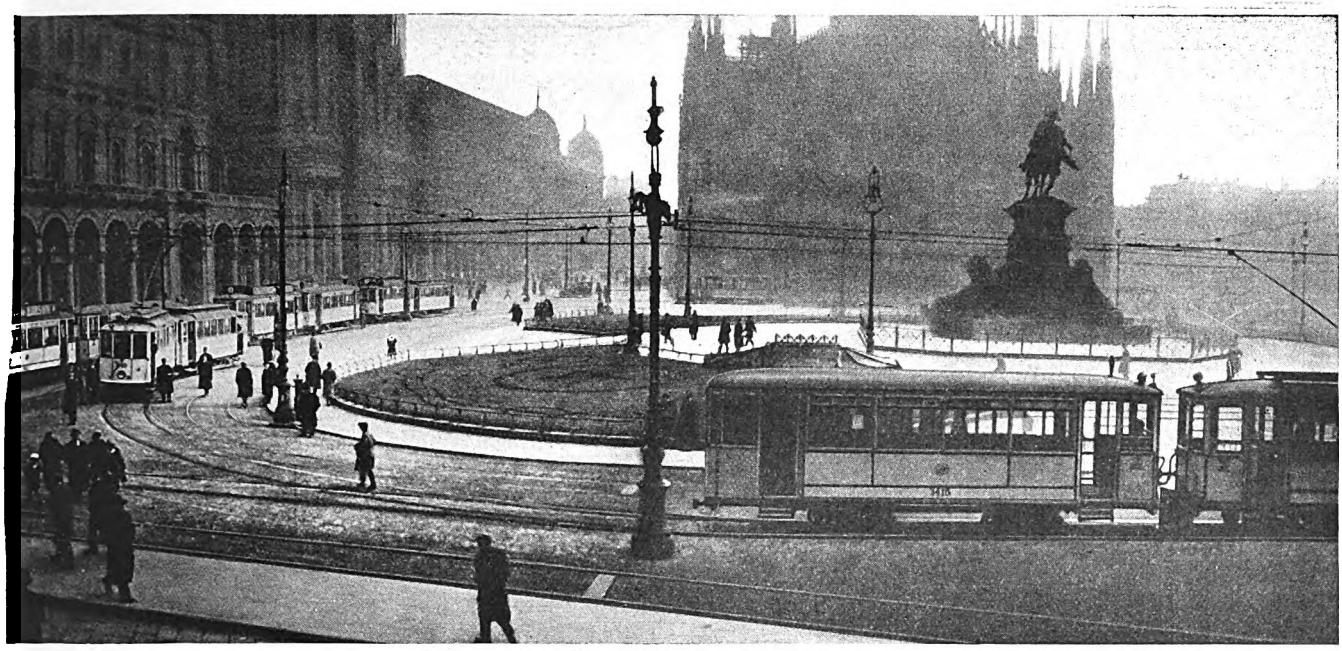

Piazza del Duomo (Cathedral Square) Milan, before rerouting of tramway lines. Many routes formerly terminated at this point, causing much congestion and delay

MILAN Improves Local Transportation

City recently has changed from left-hand to right-hand operation, rerouted its cars, shortened stop spacing and increased scheduled speed. Modernization of rolling stock is under consideration

By Henry W. Blake
Senior Editor "Electric Railway Journal"

RAPID increase in the population of the city of Milan, in northern Italy, and failure to expand and improve the transportation facilities resulted some time ago in the creation of a condition of intolerable traffic congestion. To solve the problem thus created the Mayor selected Comm. Ing. Gaetano D'Alò, an eminent traffic expert. After thorough investigation of the situation, plans were worked out to relieve the congestion. Already the most important features have been put into effect, although some steps remain to be taken.

Milan reminds the visitor of an American city more than do any of the municipalities farther south. In the first place, it is an industrial center. It is said that 40 per cent of the industrial development of Italy is in Milan and vicinity. These industries include seven or eight large car-building plants. The city is also an important financial and mercantile center, being a logical distributing point for the upper part of Italy. Although only a few miles from the Alps, Milan is located on a broad plain watered by the river Po and its tributaries. While its streets are narrow in some portions of the city, in general they are broader, straighter and more level than those in either Rome or Naples. The population of Milan is 910,000, and with immediately adjoining villages and towns it is well above 1,000,000 inhabitants.

Until ten years ago the electric railway system was operated by the Milan Edison Company, the pioneer central electric lighting company in Europe. Operation was under a franchise according to which the city owned and maintained the track, while the cars were owned and operated by the company. Receipts were divided according to a predetermined ratio. Since Jan. 1, 1917, when the city took over the property, the railway has been a department of the municipal government.

Under the old conditions the heart of the city, the Piazza del Duomo, famous for its historic cathedral, was the place of greatest congestion. From that square car lines radiated in all directions toward the outskirts of the big city. Operation of large numbers of cars on the multiple loops created a veritable whirlpool. This, together with the other traffic, caused serious congestion, the effects of which manifested themselves frequently

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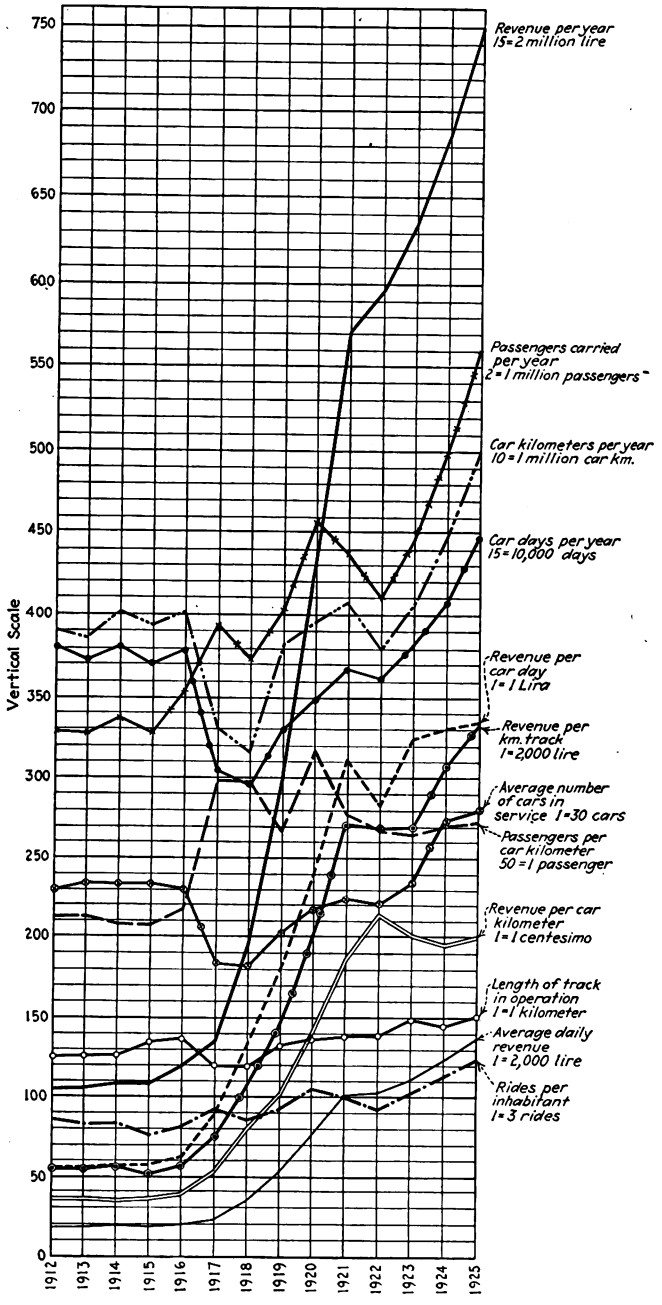
in delays and service interruptions all over the system.

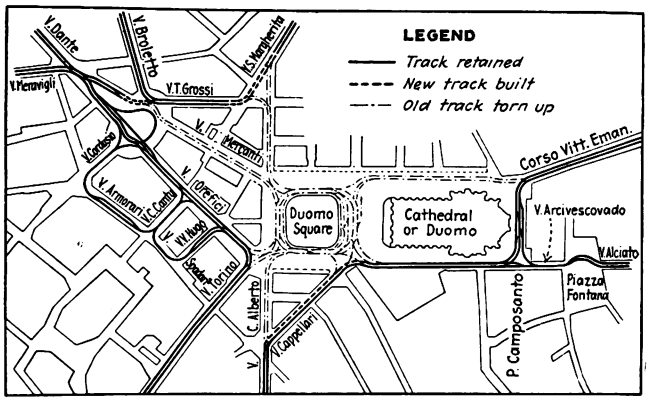
Concentration of trolley lines on the Piazza del Duomo and on the Circonvallazione loop, while satisfying the urban traffic needs of the past decades, became unsatisfactory with the recent expansion of the outlying districts of the city and the incorporation of neighboring communities in the urban area. Building of a subway was at one time considered as the ideal solution of the



Milan Tramways statistics for fourteen years

problem, with underground passages for pedestrians at the approaches to the Piazza del Duomo and the substitution of buses for street cars in the central district.

Aside from the uncertainty as to the adequacy and suitability of bus lines as the sole means of carrying the large volume of traffic during rush hours, it was apparent that such a program was not capable of immediate execution. Besides the organization of a complete bus service, it would have entailed considerable tearing down of buildings at the outer edge of the central district to provide for the installation of loop trolley terminals. Careful consideration was given by the authorities to



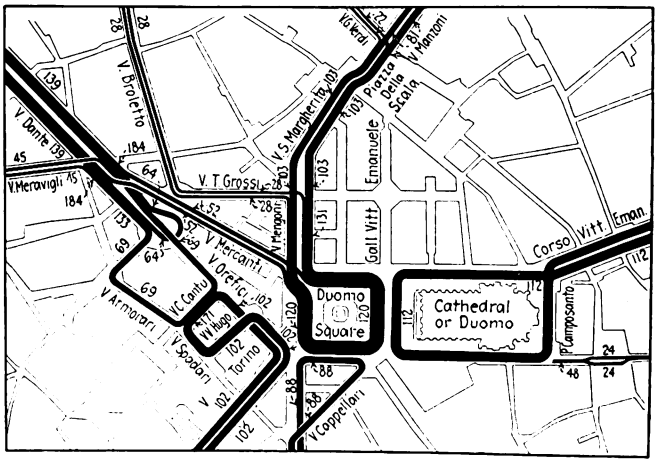
Track changes recently made in central business district to permit through routing of tramway lines

traffic studies in numerous American cities, as outlined from time to time in ELECTRIC RAILWAY JOURNAL.

Mr. D'Alò, realizing the urgent necessity for relieving the intolerable situation existing at the Piazza del Duomo, made this problem the primary object of a careful and comprehensive study. In September of last year he presented his reorganization project to the Mayor, who, in turn, submitted it immediately to the President of the Council. Approval was promptly secured. It was decided to abandon loop operation around the Piazza del Duomo for the more modern plan of through routing. One of the accompanying maps shows clearly the congested condition before the change was made. A second shows the track retained, the new track built and the old track to be torn up in making this change.

At the beginning of October the shops made the first deliveries of materials and on the fourth of that month the first stroke of the pick rang out in Via Capellari. From that day on the work was carried forward by day and night shifts, continuing uninterruptedly in spite of ten days of rainy weather until the connecting lines between Via Carlo Alberto and Via Capellari, Tomaso Grosso and Via Dante, Via Orefice and Via Victor Ugo, Corso Italia and Via Col di Lana and Largo Cairoli were completed, including the complete relaying of the track in Via Dante from Via Meravigli to Via Broletto on the one hand and from Via Meravigli to Via Broletto on the other. Two months of intensive work sufficed for the execution of the plan, and the Piazza del Duomo was freed from trolley car congestion as though by magic.

The size of the undertaking completed in this short



Flow diagram showing severe congestion formerly existing in the center of Milan

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period under unfavorable weather conditions is shown by the following statistics:

Time of track hands, man-hours	16,512
Time of track layers and track foremen, man-hours	1,333
Automatic switches installed	7
Built up switch points, pairs	20
Built up crossings and special work, layouts	75
Curved rail, 100-ft. radius, lengths	122
Weight of rails installed, kilograms	14,770
Weight of accessories installed, kilograms	7,610
Weight of track accessories removed and transported to store yard, kilograms	11,490
Cost of labor, lire	85,244.80
Cost of material, lire	509,758.40

At the same time the Porta Romana line was extended from Viale Brenta to Via Basilicata, adding to the system 1,109 m. of track. This extension was necessary in order to enable the trains of the Loreto line to proceed as far as Viale Basilicata and to eliminate the waste of time in attaching and detaching the trailers on the return trip. On Nov. 27, 64 days after the approval of the project, all the essential trackwork was completed and on Nov. 29 not a single car was operating around the Piazza del Duomo.

As a result, the service has been greatly improved. Formerly about 6½ minutes was required by a car to pass around the Duomo loop. In car-kilometers, it is estimated that of the 50,221,000 operated on the entire system in 1925 about 1,000,000 were spent in traversing these loops. Hence, their abandonment meant that amount of clear gain. In car-hours the saving in operation was even greater.

Change Made to Right-Hand Operation

At the same time a change was made from left to right-hand operation. While the general rule of the road in Italy outside the towns is for vehicles to keep to the right, the steam railroads have left-hand operation, and consequently in many cities left-hand operation for both electric cars and other vehicles has been in vogue. The change to right-hand operation, which was brought about by a government order abolishing left-hand operation on highways everywhere, necessarily meant extended changes in the track at crossovers and other points, but was carried through without serious difficulty. No great change had to be made in the newer cars themselves, for reasons mentioned later.

Several other improvements recently have been made in the service. A school of instruction was opened for teaching motormen how to secure a rapid but smooth acceleration and retardation by proper manipulation of the controller and braking equipment. Heretofore, all instruction had been from a safety standpoint only. The time of car stops was shortened by introducing a system of passenger circulation within the cars. By signs, passengers were instructed always to board the cars by the rear platform, move forward after boarding and leave the car by the front platform. Conductors were instructed to urge passengers to follow these rules. By an intensive campaign of education, in which the public was told that these steps were in the interest of better service, remarkable results were obtained. The design of the cars, though old, helped in this campaign.

At present there are about 600 of the older type motor cars in Milan, an inheritance from earlier days. They are short, and each usually hauls a trailer of the same length. Most of these motor cars were built when the "accelerator" type of door was popular, and they are equipped with this type of door on both platforms. As originally used for left-hand operation, the door on the rear platform was close to the curb and that on the front platform away from the curb. When used, as now, for right-hand operation, the rear platform is of course on the side away from the curb and the front platform door near the curb. This gives an easy exit

Track reconstruction incident to the rerouting

from the front platform, as well as a fairly good reservoir space on the rear platform.

The Milan Tramways is planning gradually to replace these cars, or the greater part of them, with more modern rolling stock, but in the meantime, considering their age, they are not as badly adapted to a rapid passenger interchange as might be expected.

Incidentally, it might be added that all the electric railway cars in Milan are painted white. This makes the car a very conspicuous object on the street. White is an especially desirable color at night because an approaching car may be seen at a considerable distance. This enables passengers to stand near a boarding point and so reduces the time of passenger interchange.

Car design in Milan, as well as elsewhere in Italy, is greatly hampered by the over-all limitation to width imposed by the short distance between tracks necessary

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Material yard of the Milan Tramways filled with ties, rail, etc., to be used in extensive track reconstruction program

because of the narrow streets. The present cars in Milan are about 2.16 m. (6 ft. 11 in.) in over-all width. In the new cars which the tramways contemplates having built it is thought that this width can be increased slightly, to about 2.3 m. (7 ft. 6½ in.), provided there is spreading of tracks which are now very close.

It is also hoped to reduce the height of the car floor by the use of smaller wheels. Most cars in Italy use an 838-mm. (33-in.) wheel because of large diameter motors, and these in turn have been thought necessary because part of the axle width between wheel hubs must be given up to the eccentric of the axle-driven air compressor. With motor compressors and small-diameter motors there would be no difficulty in bringing down the car floor to American standards. Ing. Giovanni Cuccoli, engineer of rolling stock, is now engaged in working out the plans for new cars. Tests are now being carried out to determine the possibility of pay-as-you enter or other system of fixed point fare collection in an effort to speed up car operation; cars are being operated in experimental service with manually controlled doors and steps, and an experiment is being now carried out with pneumatic door and step operation in two-car trains. This will affect materially the design of new cars, which in every case will be based on all-steel, low-wheel, double-truck construction of strictly American type.

Two methods recently adopted by the management for increasing the schedule speed of the cars without increasing their maximum speed have been mentioned. These are rerouting to avoid congested points and the reduction of boarding and alighting time by improved car design. A third method is by systematic efforts to reduce street congestion. While the number of private automobiles in Milan in proportion to the population is much below that of an American city, it probably is higher than any other Italian city, and the problem of street congestion is already a considerable one in Milan. One step being taken to reduce it is a limitation on parking in the business districts. Another is the prevention of cruising by taxicabs. To accomplish this, the law requires each taxicab driver to return to his assigned station after the completion of a trip, although it permits him to take up a passenger and make another trip, provided he obtains a passenger while returning to his station by a direct road. The law also requires him to keep a trip sheet, on which he must enter every pay trip made as soon as completed, and he must file a copy of this trip sheet every evening with the management of his taxicab company, so it can be checked by the police. The police are also empowered to stop at any time any taxi which they suspect of cruising and ask the driver to show them his trip sheet. Finally, all local transportation in the city, including taxicabs, has been placed by the city authorities under the general direction of a manager of local transportation, who is, *ex officio,* also the manager of the local electric railway system. All this helps toward systematic co-ordination of local transit.

Car Stops Reduced

A fourth method of speeding up the movement of cars in Milan has been by reducing the number of stops. As in other European cities, the car stops are clearly marked by signs, which in Milan are of metal, usually hung in the middle of the street from a span wire. A sign reading Fermata Obbligatoria means an obligatory stop; i.e., a stop at a crossing with another track or at some other point where the car will stop for traffic reasons, whether or not passengers wish to board or leave. A sign reading Fermata Facoltativa means an optional stop; i.e., the car will stop to receive or discharge passengers, but not otherwise.

The number of stops of both kinds within the city limits of Milan now averages about eight to the mile. This is higher than in some other Italian cities, and a study is being made to determine whether this number can be reduced. The present schedule speed of the cars is about 11 km. (8½ miles) per hour.

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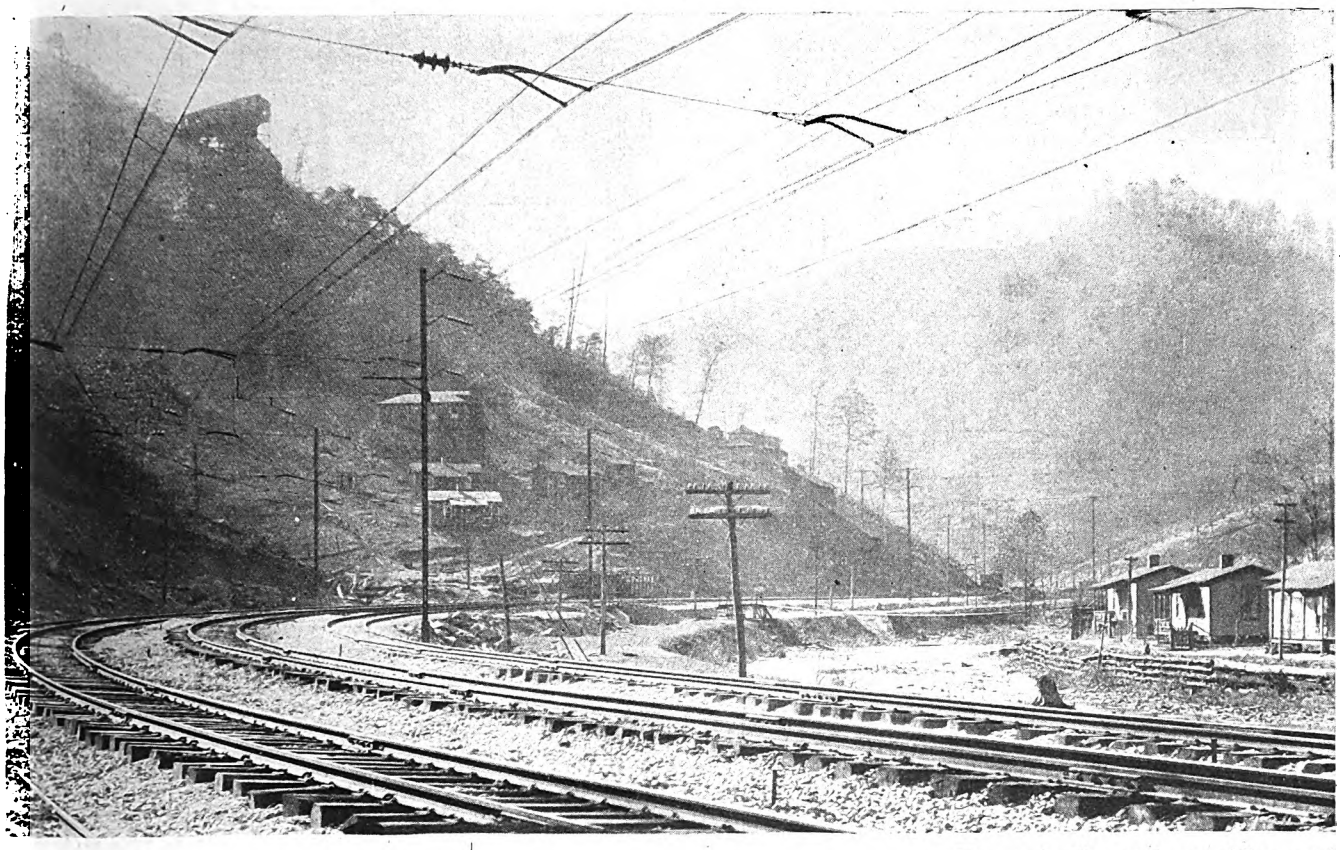

Two main line and one siding track showing curve construction on the Virginian Railway between Roanoke, Va., and Mullens, W. Va.

Catenary Overhead of the Virginian Railway

By B. M. Pickens

General Engineer
Westinghouse Electric & Manufacturing Company

CATENARY construction is used throughout for the suspension of the overhead contact line of the Virginian Railway. The system over each main-line track consists of a mixed strand, copper and bronze messenger supporting through rigid bronze hangers either one or two hard-drawn grooved copper auxiliary wires and a single No. 000, 65 per cent conductivity bronze contact wire. The contact wire and auxiliary wires are clipped together with pressed Phono-Electric bronze clips at intervals of 15 ft. on tangent and the hangers from the messenger to the auxiliary wire are spaced 30 ft. apart. Each clip is spaced 7½ ft. from the adjacent hanger. On curves the lower hanger clip grips both the contact wire and the auxiliary wire or wires and the hangers are spaced 15 ft. apart. The messenger, auxiliary wire or wires, contact wire and hangers are entirely non-ferrous.

The messenger over each track of the main line between Elmore substation and Clark's Gap substation, which constitutes the ruling grade, is composed of nineteen strands, of which a core of seven are extra high strength bronze and the twelve surrounding wires are hard-drawn copper. The diameter of this messenger is 0.725 in.; it has an ultimate strength of 25,000 lb. and an equivalent conductivity of 270,000 circ.mil copper. Two No. 000 or two No. 00 grooved copper auxiliary wires are used on this section of the main line. The messenger, two No. 000 auxiliary wires and the contact wire give a total equivalent conductivity of approximately 714,000 circ.mil copper.

Between Clark's Gap and Princeton a similar type of messenger is used except that it is smaller. It is 0.555 in. in diameter, has an ultimate strength of 15,000 lb., and an equivalent conductivity of 159,000 circ.mil copper. With this messenger a single No. 00 copper auxiliary wire is used, which, with the messenger and contact wire, give an equivalent conductivity of 400,000 circ.mil per track. Additional conductivity is contained in the feeder or balance wire which is required by the three-wire distribution system employed. There is one feeder or balance wire per track of main line. Between Elmore and Clark's Gap the size is No. 0000 and from Clark's Gap to Princeton it is No. 00.

The present normal height of contact wire is 24 ft. 6 in. above the top of rail.

The normal sag of either messenger is 5 ft. in 300 ft. The normal tension of the No. 000 bronze contact wire is 3,000 lb., of each No. 000 auxiliary wire it is 1,200 lb.,

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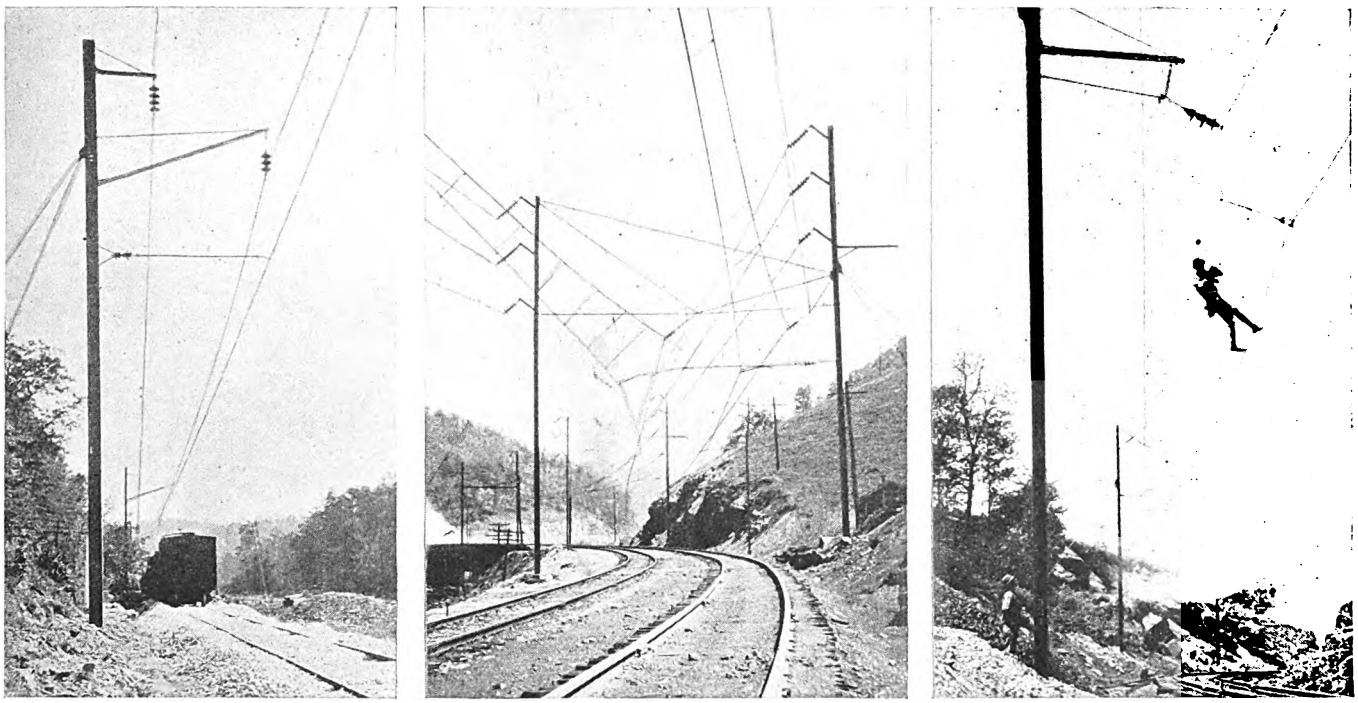

Typical views of the overhead on the Virginian Railway electrification

At left, tangent type support near transition to curve showing inclined bracket arm and steady arm.

In center, two-track curve support on heavy grade section. One single-phase, 88,000-volt, 25-cycle circuit on each pole.

At right, linemen attaching hangers to messenger. Also showing special hanger used in strengthening the contact and auxiliary wires.

and of the No. 00 auxiliary wire it is 1,000 lb.

Inclined catenary, similar to that used on the Pennsylvania Railroad and the Norfolk & Western Railway, with pull-offs at the supporting and intermediate poles, is used on all main-line curves, except on those having large radii, where the pull-offs are omitted.

The catenary system in the yards consists of a single ⅜-in. diameter high-strength bronze messenger, supporting through rigid hangers spaced 20 ft. apart a No. 000 bronze contact wire. The breaking strength of the messenger is 10,000 lb. Chord type construction with pull-offs is used on curves.

Maximum span lengths of 320 ft. are used on both tangent and curve. Where the 88,000-volt transmission line is carried on the poles that support the contact system, long spans are used where possible to reduce the insulation costs. With long spans one or two pull-off poles are placed between the main supporting structures on some curves. On those sections of route having no transmission line on the supporting poles, shorter curve spans and fewer pull-off poles are used. The length of span and number of pull-off poles is determined by the radius of the curve.

The overhead system is insulated for 11,000 volts. If in the future it is decided to change to 22,000 volts, a single suspension insulator unit will be added to each.

Cross spans with back-guyed H-section supporting poles are used as supports for the catenary system for two or more tracks. The single-track catenary is supported from bracket arms attached to H-section poles, back-guyed on curves, but not on tangent. An 88,000-volt,

TABLE I—TYPES OF CATENARY SUSPENSION USED ON THE VIRGINIAN ELECTRIFICATION

Type	Track	Poles	Guys	Pull-offs	Cross Catenary	Cross-Body Strand
1	Single, tangent	One 12-in., 65.5-lb.	None	None	.....	.....
2	Single, low-degree curve	One 10-in., 49.5-lb.	Two ½-in. strands, forked 60 deg.	At poles	.....	.....
3	Single, higher-degree curve	One 8-in., 32-lb.	Two ½-in. strands, forked 60 deg.	At poles	.....	.....
4	Double, tangent, one main, one passing	Two 10-in., 49.5-lb.	One ¾ in. per pole	Wire steadied in exposed localities	⅝-in. Siemens-Martin strand	.....
5	Double, tangent, one main, one passing	Two 8-in., 32-lb.	One ¾ in. and one ½ in. per pole	Wire steadied in exposed localities	⅝-in. Siemens-Martin strand	
6	Double, low-degree curve, one main, one passing	Two 10-in., 49.5-lb.	One ¾ in. per pole	Wire steadied in exposed localities	⅝-in. Siemens-Martin strand	⅝-in. Siemens-Martin strand
7	Double, higher-degree curve, main and passing	Two 10-in., 49.5-lb.	Two ⅝-in. strands forked 60 deg.	Yes	.....	.....
8	Double, tangent, heavy grade section	Two 10-in., 49.5-lb.	One ¾ in. per pole	Wire steadied in exposed localities	⅝-in. Siemens-Martin strand	.....
9	Double, low-curve, heavy grade section	Two 10-in., 49.5-lb.	One ¾-in. per pole	Wire steadied in exposed localities	⅝-in. Siemens-Martin strand	⅝-in. Siemens-Martin strand
10	Double, curve	One 10-in., 49.5-lb.	Two ¾ in. per pole	Pulled off at structure	.....	.....
11	Double, tangent, witn one transmission line	Two 10-in., 49.5-lb.	One 1 in. per pole	.....	⅝-in. Siemens-Martin strand	.....
12	Double, low curve, with one transmission line	Two 10-in., 49.5-lb.	One 1 in. per pole	.....	⅝-in. Siemens-Martin strand	⅝-in. Siemens-Martin strand
13	Double, curve, two main tracks, with two transmission lines	Two 10-in., 49.5-lb.	Two ¾-in. guys one side, one ½-in. guy other side	.....	⅝-in. Siemens-Martin strand	⅝-in. Siemens-Martin strand
14	Triple, tangent, one main, two passing	Two 10-in., 49.5-lb.	One 1 in. and one ½ in. per pole	.....	⅝-in. Siemens-Martin strand	⅝-in. Siemens-Martin strand
15	Triple, curve, one main, two passing	Two 10-in., 49.5-lb.	Two ¾ in. one side, two 1 in. other side	6-in. poles, back guyed	⅝-in. Siemens-Martin strand	⅝-in. Siemens-Martin strand
16	Yards	Two 8-in., 12-in. or 14-in.	Various	.....	Various	Various

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two-circuit, single-phase transmission line is carried on the main supporting poles of the catenary system between Matoaka tunnel and Elmore substation except for 4.3 miles west of Clark's Gap. One circuit is carried on each pole of the cross span.

The supporting poles are all of rolled steel or an equivalent French H-section. They are regularly set 10 ft. 6 in. and 12 ft. from the center line of the track. The minimum distance permitted on the main line is 10 ft. 6 in., but some poles are set 12 ft. or more to clear the gutter along the track through cuts.

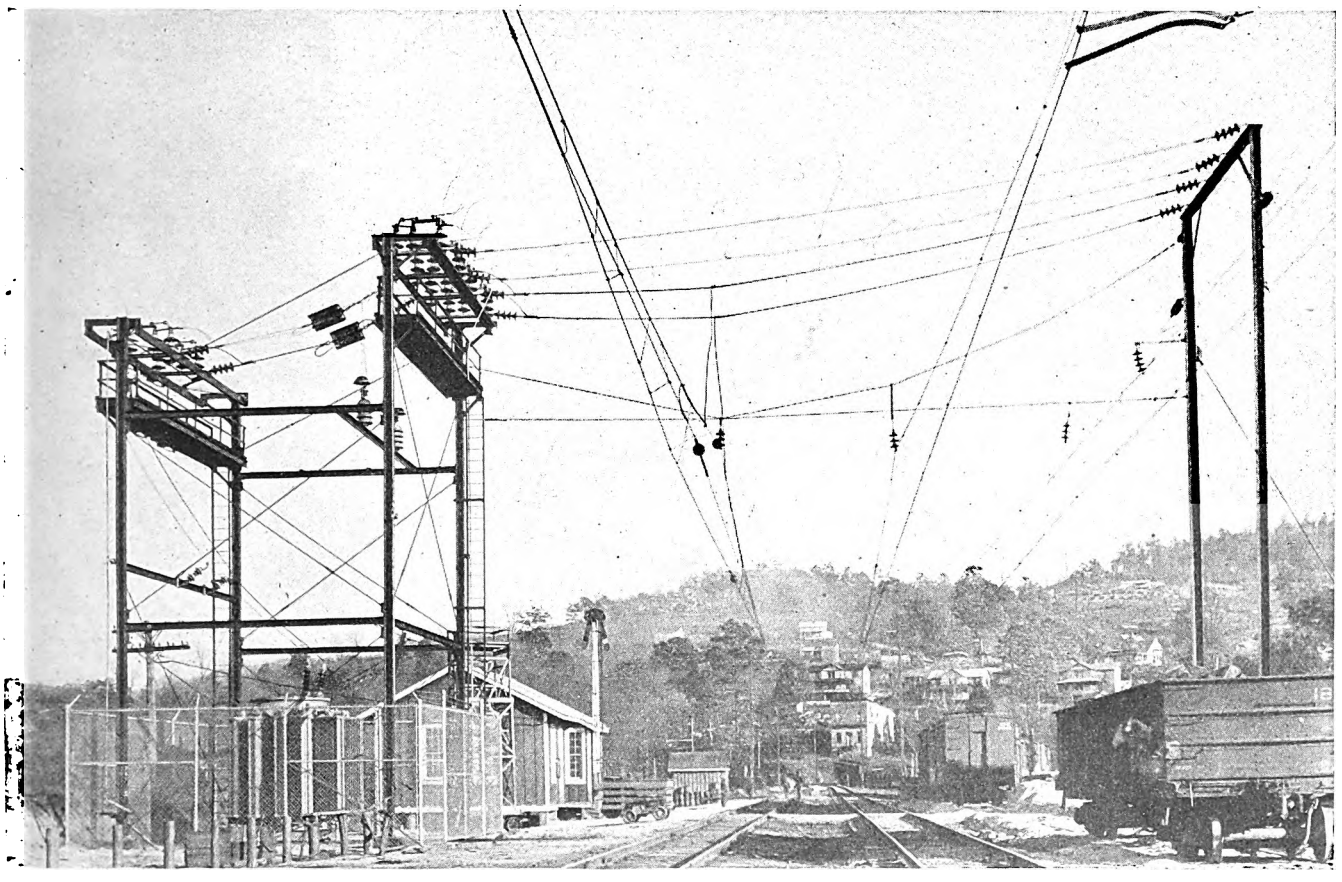
The single-track tangent pole is a 12-in., 65.5-lb. section, without guy. To it is attached an angle section bracket arm with tension rod, which supports the catenary system through a string of three suspension insulators equipped with suitable hardware, a short angle-iron bracket arm for supporting the balance wire, also insulated by three suspension insulator units, and a steady arm rigidly attached.

The bracket arm for supporting the catenary system is of unusual design. Instead of being horizontal it slopes up from the attachment to the pole. The tension rod which is fastened to its outer end and to the pole is in a horizontal position. With this arrangement, the messenger is attached to the lower end of the insulator string at a point about on a level with the point at which the bracket arm is attached to the pole. Thus it is possible to use a shorter pole than could be used with a horizontal bracket arm.

The steady arm is made up of a horizontal pillar type insulator fastened rigidly to the pole. To it is flexibly attached a galvanized pipe having fitted into its outer end a rod equipped with a clamp for gripping the auxiliary wire just above the contact wire. The rod may be moved in or out of the pipe to give the right length to the steady arm.

Specifications for the poles and wires of the various types of construction are given in Table I. Two sizes of poles are used on the single-track curves, depending on the degree, as indicated in Types 2 and 3. Types 4 and 5 are the double-track cross catenary for tangent track, while Types 6 and 7 are for higher degree curves. On the heavy grade section west of Clark's Gap, where there is no transmission line on the poles, Type 8 is used for the tangents and Type 9 for low curves. Type 10 is used for the sharper curves in this region.

The two-track tangent cross-catenary supports for two main line tracks with a single-circuit, single-phase, 88,000-volt transmission line on each pole is made in the form of Type 11 on tangents and Type 12 on low-degree curves. Where there are two main line tracks and two single-phase transmission lines Type 13 is substituted. Three-track cross-catenary supports are indicated in Type 14 for tangent track and Type 15 for curves. In this construction all pull-off poles excepting those on bridges and some in the yards are back-guyed.



Air section at substation on single track main line

The yard cross-span supporting poles are 8-in., 12-in., or 14-in., or equivalent H section, back guyed. Steel strand cross catenaries are attached to U-bolts or eye nuts in the poles by sockets. A cross steady span is run from pole to pole just below the cross catenary, and the insulators for each messenger are attached to it and supported from the cross catenary by droppers, straps near the center of the cross catenary where the distance is short and strand near the poles. A second steady strand is located just above the contact wires and it is attached to them by short, steady arms.

Concrete protecting sleeves are cast around the lower

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ends of all poles. This work was done in a yard at Roanoke. From this yard the poles were shipped out to where they were to be used and set with a crane in holes previously prepared for them. To prevent earth holes from caving in, and to give a straight-sided pole in rock instead of the cup-shaped one caused by blasting, corrugated sheet iron culvert pipe was set in the holes as they were dug and earth and rock were filled in around the pipe. Coarse rock was used for filling in around the pole and it effectively locked the pipe to the concrete sleeve.

Anchor blocks for the guys were also made up in the yard at Roanoke and shipped out to be placed, by a crane on the work train, into holes prepared for them.

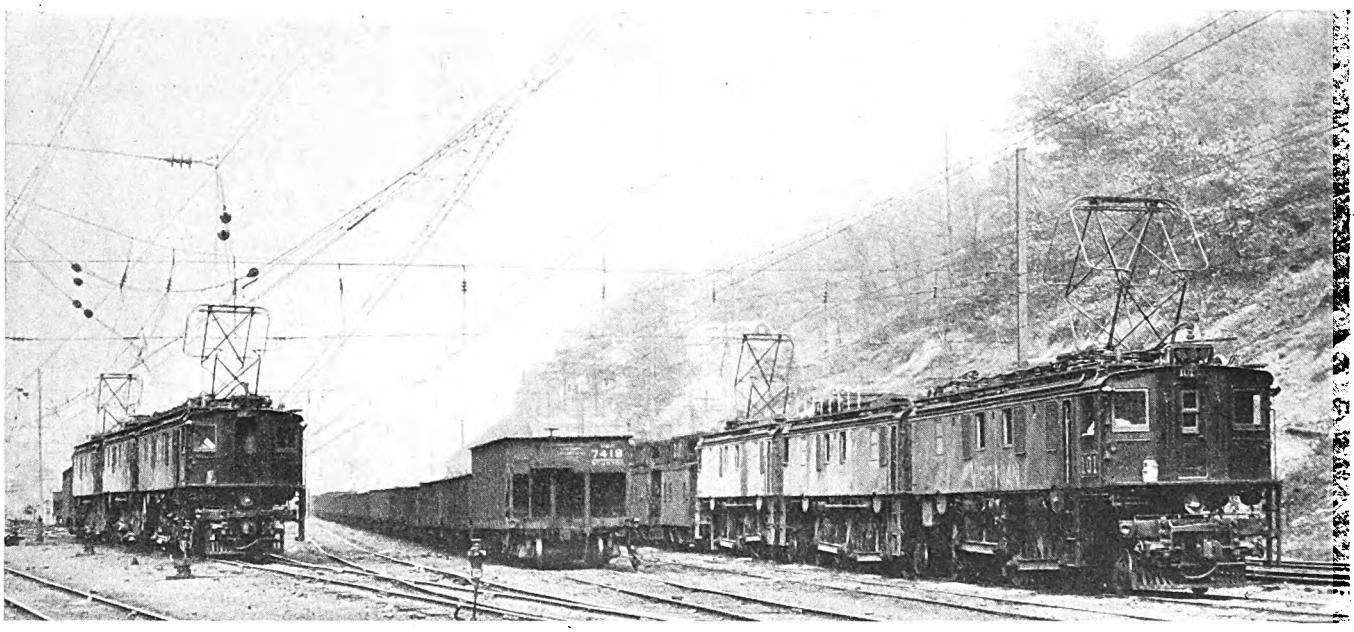
Straight round anchor rods threaded on each end are used. The lower end screws into an attachment on the anchor block and the upper end is provided with a turnbuckle attachment for adjusting the guy tension.

TABLE II—PROPERTIES OF SUSPENSION INSULATORS

Insulator number	601	631	633
Trade voltage rating	20,000	20,000	20,000
Dry arc-over voltage	80,000	80,000	75,000
Wet arc-over voltage	46,000	45,000	40,000
Diameter of insulator, inches	10	10	10
Distance between centers, inches	5⅛	5⅜	6½
Leakage distance, inches	11½	10½	9½
Wet arcing distance, inches	3½	3 7/16	3
Approximate net weight per 100, pounds	1,050	1,300	1,600
Average combined mechanical-electrical strength, pounds	10,500	18,000	27,000
Average ultimate mechanical strength, pounds	11,000	20,000	30,000
Average puncture voltage in oil	135,000	135,000	135,000
Working load, pounds	.....	.....	9,000

insulator in each contact wire at opposite ends of the air sections. There is not sufficient clearance to permit the use of porcelain insulators.

In tunnels and under low bridges, where required by clearances, a special pillar-type insulator, made up of two similar units bolted together, is used. Each unit is 7¾ in. high and has two porcelain sheds, one of 13-in. and the other 12-in. diameter. A metal cap is provided



Special overhead construction on in yard at Elmore

A socket on the guy end attaches to the eye of the turnbuckle. In rock the rod is grouted into drilled holes and in some instances the lower end is split and a wedge inserted which is forced into the split when the rod is driven into the hole.

Forged steel sockets are used on the ends of guys for attaching to the poles or anchor rods. These sockets were poured with spelter at the shop in Princeton, where the work could be supervised and controlled.

The contact system and balance wires are insulated by suspension insulators, three and four units to a string. Westinghouse No. 601 insulators are used at suspension points and in pull-offs. No. 631 insulators are used in dead-ending contact and auxiliary wires. The extra high strength insulator, No. 633, is used for dead ending and sectioning the messenger. It is strong enough so that not more than one string of insulators was needed for dead ending any strand. The properties of these insulators are given in Table II.

Air sections are used in cross-overs, at substations and in the yards for sectionalizing. The contact wires are run by each other and each wire is attached to the auxiliary wire above the other contact wire. They are held apart and are alternately lifted one above the other to permit the insertion of a 6-ft. impregnated wood stick with four holes for bolting to the roof of the tunnel, and two special castings hold the messenger directly against the insulator base. Four bronze bolts hold the insulator against the tunnel roof and they are held by expansion anchors into holes drilled in the roof.

In tangent tunnels with sufficient clearance three suspension units held up by a single bolt in the roof support the messenger. The contact wire is normally 19 ft. above the rail. On curves in two-track tunnels suspension insulators support the catenary over the track on the inside of the curve and the special insulators are used for the track on the outside of the curve. The catenary on sharp curves (some are 12 deg.) in tunnels is special. That on the heavy grade section, where two auxiliary wires are used, has the second or upper auxiliary wire raised about 6 in. above the contact and other auxiliary. The two are held apart by short hangers. The upper auxiliary wire is separately attached to the messenger by its own hangers. Thus a triangle is formed, with the contact and one auxiliary wire at the lower corners. The short hangers between these two wires and the other auxiliary wire form the short side of the triangle and the other two sides are formed by the two sets of hangers from the messenger. With this pull-offs are not needed even on the 12-deg. curves.

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The contact wire splicer is of unusual design, being made up of four pieces of sherardized steel held together by six machine bolts. The splicer, which is 10 in. long, does not encircle the wire, but only grips above the groove. The ends of the two wires to be joined are put into a die and a cutter is forced through, the die cutting a series of notches in the back of the wire varying from nearly as deep as the groove near the end of the wire to very slight near the end of the splicer. The chuck jaws of the splicer have teeth to fit into these notches. The two sides of the splicer fit into the groove in the wire and hold the chucks into the notches. A Cleveland-type chuck splicer is used for the auxiliary wires.

Tangent hangers are made up of a ¼-in. Phono-Electric rod with each end bent into a half ring, having at the upper end a cast bronze clip which grips the messenger, and at the lower end a pressed clip for attaching to the auxiliary wire, or in the yards to the contact wire. The clips are adjustable to allow for the varying slope of the messenger with respect to the contact wire.

The curve hangers have ⅜-in. Phono-Electric rods with a clip similar to that used on tangent for the messenger, but the lower end is upset and threaded. It passes through the two halves of the clip between the contact and auxiliary wire and holds them together.

Deflectors at cross-overs and turnouts were built up from curve and tangent hanger parts and from special spreader rods, each rod having upset threaded ends similar to those on the lower ends of the curve hangers. The hangers were cut to fit in the field and the half ring put on the end of the rod with a special tool.

Pull-off yokes are made from galvanized steel strap 2¼ in. x ¼ in., 4 ft. 3 in. long. One end is punched for attaching the pull-off strand and the other bent to almost a right angle and provided with a hole for bolting on the contact wire clip. The yokes are usually used in pairs.

The hanger rods were received at Princeton in bundles of half span lengths marked with tags for the spans in which they were to be used. The bundles were opened in the shop and the clips attached at each end, after which the bundles were put together again and shipped out to the place where they were to be used. The hangers were attached to the messenger by a lineman riding along the messenger on slings. Helpers on the ground measured off the spacing and marked the hanger locations on the rail. The hangers were clipped to the contact and auxiliary wires by crews working from tower cars. Hanger lengths were calculated in advance to fit the curves and spans where they were to be used. For this an accurate survey of the road was needed, giving location and radius of curves and characteristics of the spirals.

One pole of each supporting structure is bonded to the rail. In the tunnels, a copper ground wire is run along the roof of the tunnel and is attached to the cap of the upper insulator of each support.

The two main-line tracks are sectionalized from each other so that they can be operated separately. Princeton yard is sectionalized from the main line and at Elmore yard the two outside tracks are sectionalized from the remaining ten tracks, which are divided into two groups of five each.

The main-line tracks are bonded with two No. 0 detachable pin-terminal, single-strand bonds per joint. These are semi-concealed where the splice bar permits and exposed where they cannot be placed behind the splice.

The entire electrification includes 134 route-miles of track from Mullens, W. Va., to Roanoke, Va. Of this, approximately 36 miles, from Mullens to Princeton, W. Va., has been in operation since September, 1925, and the remaining 98 miles to Roanoke since September, 1926. On the section from Mullens to Princeton, a distance of 21 miles from Mullens to Matoaka is double track and a distance of 15 miles from Matoaka to Princeton is single track. With the remainder of the electrification included, there are more than 200 miles of track under contact wire. Articles on the electrification have appeared in ELECTRIC RAILWAY JOURNAL for Sept. 21, 1925, and several subsequent issues.

New Shop for Cincinnati Street Railway

Eight Departments Housed Under One Roof—Sand-Blasting Room, Car-Washing Room and Oil and Waste Reclaiming Department Are Included

BY E. J. JONAS
Superintendent of Equipment Cincinnati Street Railway, Cincinnati, Ohio

EVEN though plans for the new car repair shop now under construction for the Cincinnati Street Railway are not yet completed, the building for this shop is well under way and should be ready for occupancy about Oct. 1. The stores department, not shown on the accompanying plan, will be located to the right of the shop building and will have an area of about 25,000 sq.ft.

The design of the shops departs from conventional lines, in that the various departments are housed under one roof. Provision is made for the cars to enter the building through doors on either end directly onto the depressed type of transfer table, which is equipped with a car body hoist.

As cars come into the shop for overhauling the bodies will be removed from the trucks on the transfer table and dummy trucks installed. The car body will then be placed in the erecting shop and trucks placed on tracks in the truck department.

The general dimensions of the shop are 428 ft. x 388 ft., with the usual provisions for an electrical department, wheel department, machine shop, forge shop, paint shop, mill room, erecting shop and truck shop. The paint shop is the only department that will be inclosed separately. It will be equipped with an exhaust system to facilitate use of the spray method of applying paint and lacquer. Ample space is allotted each department, not only to provide for the present needs of the property but also to take care of the mechanical department in its natural growth for a period of more than twenty years.

Provision is made for handling 64 cars. About 14,000 sq.ft. of floor surface is allotted to the electrical department, 13,000 sq.ft. to the machine shop, 11,000 sq.ft. to the forge shop, 7,000 sq.ft. to the wheel department and 9,000 sq.ft. to the mill room. The handling of materials and supplies through the various shop departments and into the storage room will be by industrial electric trucks of the elevating platform type.

One of the unusual features is that the tunnel through which the heating ducts are carried for distribution to the shop will be enlarged to accommodate the passage of

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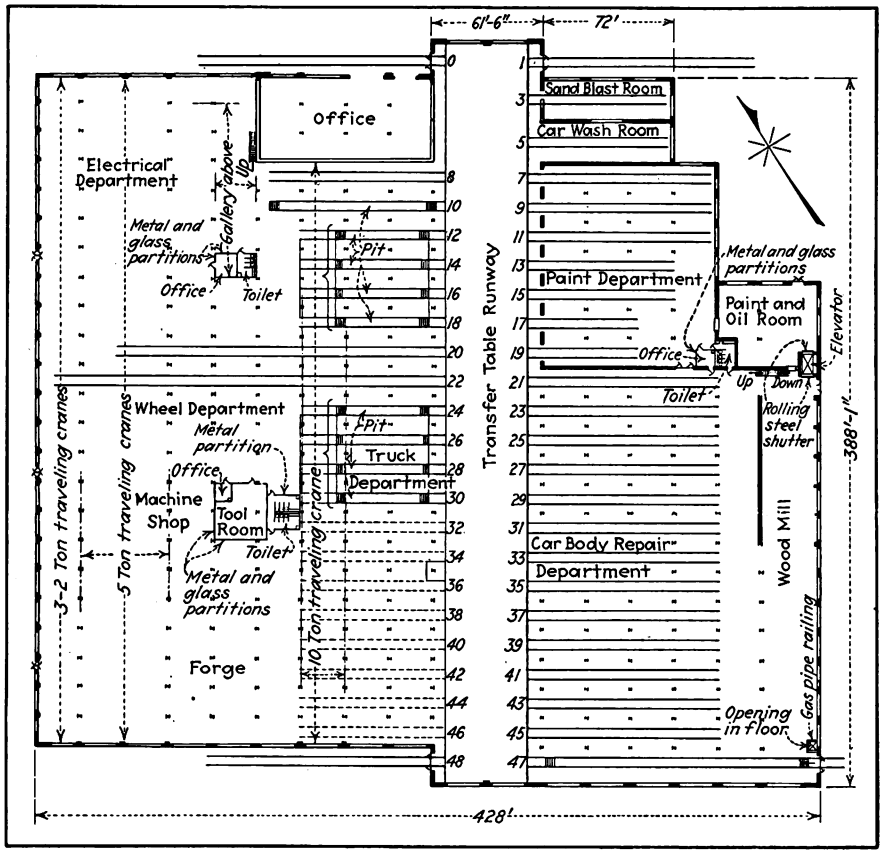

Preliminary plan of new repair shop of Cincinnati Street Railway

the electric trucks from the storage room basement to the shops. This will expedite the movement of supplies, because the trucks will not be subjected to the usual delays caused by material or workmen passing through the aisles in the shop. Elevators are located at convenient points in the shop to bring the trucks to the shop floor level.

The use of monorails and jib cranes is being limited due to their small working areas. One 5-ton traveling electric crane running the full length of the building and with a 48-ft. span will serve the forge shop, machine shop, wheel department and electrical department. Paralleling this 5-ton crane, a 2-ton crane with a 24-ft. span in the electrical department will handle armatures from the time they are removed from the motor cases until they are again installed, without subjecting them to the chances of mechanical injury encountered when transporting them by means of buggies. A second 2-ton crane will be installed on the same runway over the wheel department for handling wheels to and from the wheel press and wheel lathe. A third 2-ton crane will be installed on this same runway over the machine shop to handle material to and from the lathes which are arranged in this bay. By means of these cranes it will be possible to cover approximately 50 per cent of the floor space in the forge, machine shop, wheel department and electrical department, and all machines that handle heavy work will be located under these cranes.

The floor in the truck shop is depressed 15 in. below the top of the rail, allowing the work to be carried on with the workmen in normal working positions. Four electric car hoists of the overhead type are to be installed in the truck shop and traveling cranes of 2-ton capacity are to be used over the tracks where the truck work is carried on.

Adequate storage facilities are provided throughout the shop in order that equipment may be handled without cluttering up the aisles. A cellar is provided under the wheel department for storing unmounted wheels. Wheels received in carload lots will be unloaded into the cellar outside the building and will be brought up to the shop floor level inside of the building by means of an elevator at the time that they are required. Storage for wheels mounted on axles is provided on tracks just outside the building, which will allow the crane on the supply car to pick up good order wheels and deposit bad order ones without extra handling. A cellar is provided under the mill room to accommodate refuse, ducts, motors operating the mill machinery above and for storage of sweeper brooms and other bulky material. The waste and oil reclaiming plant will be located directly under the paint mixing room. Provision has been made for a sand-blast room, a car-washing room and a reclamation department.

As the greatest distance any track extends from the transfer table is approximately 90 ft., except the two tracks into the wheel department, there will be no 550-volt overhead trolley wires. Cars will be moved to and from the transfer table by means of flexible power cables controlled from the table.

Traffic Expedited by Staggering Positions of Safety Platforms

Correct Location with Respect to Each Other and Intersecting Streets Is of Primary Importance in Cincinnati—Platforms Are Never Placed Directly Opposite

By C. O. Sherrill
City Manager, Cincinnati, Ohio

CORRECT location of safety platforms with respect to each other and intersecting streets has an important effect on their usefulness. This phase of the matter was not discussed in the article published in Electric Railway Journal April 9. After considerable experimentation we have adopted in Cincinnati a staggered location with platforms about 50 to 100 ft. apart, far enough to allow motor traffic to use the street on both sides of the platform. This arrangement tremendously expedites traffic by avoiding the bottleneck created where the two platforms are opposite each other by the forcing of all traffic to the right of the platforms.

In the location of the safety platforms it has been found advisable on busy streets with motor traffic moving at 30 to 35 m.p.h. to place them not closer than about 300 ft. apart. Too close spacing in fast traffic tends to throw out of use the part of the street between two adjacent platforms. Another advantage is that it discourages too frequent stops by the street cars.

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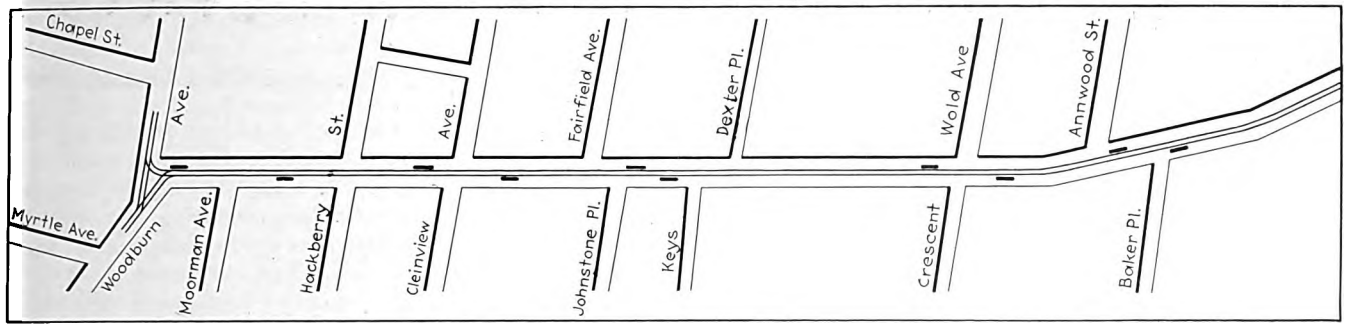

Staggered safety platforms on Madison Road, Cincinnati

Not only are the platforms valuable in streets normally wide enough for their use, but on streets as narrow as 40 ft. they are of great value. There they are installed 4 ft. wide with a 3-ft. cut-back into the sidewalk opposite the platforms to allow motor cars to pass the stopped street cars. In streets of this width without platforms a stream of motor cars sometimes a block long may be seen following a street car and unable to pass when the car is stopped, because of passengers getting off and on. In the congested district, where traffic is controlled by traffic lights, these platforms are particularly valuable because the automobiles can pass freely while the trolley is being loaded. Speeding up of traffic due to the platforms, because of the absence of pedestrians continually walking out in the roadway to board cars and the elimination of the necessity of stopping motor cars to allow passengers to get on and off, far more than compensates for the loss of space due to them.

The value of platforms to the street railway is the great increase in safety to the passengers, the expedition of loading and unloading, the decrease in the number of stops and an increase in the number of car riders. Many requests have been made for the installation of platforms, accompanied by the statement that children cannot use the street cars without them on busy streets on account of the dangers involved. Their value from the city's point of view is equally great in expediting traffic and decreasing the hazard to pedestrians and car riders.

Equipment and design of the platforms in Cincinnati is believed to be ideal in simplicity, economy, attractiveness, visibility and security. The illumination is accomplished by means of the Westinghouse redhead warning beacon with a 50-watt lamp on top in a ruby refractor and a 150-watt lamp below in a white enameled reflector to illuminate the platform and protecting fence. The over-all height of the unit is 8 ft. 6 in., the height to the light center of the 50-watt lamp is approximately 7 ft. and the height to the enameled reflector is approximately 6 ft. 5 in. The platform and other equipment are installed by the city, the railway company paying for current for the illumination. A large reflector is attached to the fence, and it has been found that it gives adequate protection in cases where the lights may be out. It is essential that the reflector be large, and also that it be kept clean in order that the automobile headlight rays will give a strong, clearly seen reflection. A protective fence, constructed around the front end of the platforms, consists of four rails set in the ground 3½ ft., with three steel bands welded horizontally across the front. This gives sufficient strength to insure protection to the pedestrians from all kinds of motor traffic.

With these methods of illumination and the large reflector used there is really no excuse for the platforms being hit by motor cars. The fence and lamp post are painted white, as a further aid to safety and also as an interest to increased attractiveness. The general result is most pleasing and has met with great favor among the people of the city. Safety platforms of this type have replaced large beacon lights mounted on masses of concrete, locally called "battleships," with the complete approval of the public and with almost complete absence of accidents to motor cars and, so far as reported, without any accidents to pedestrians.

Platforms on Madison Road are located in various relations to each other and intersecting streets, but are never directly opposite

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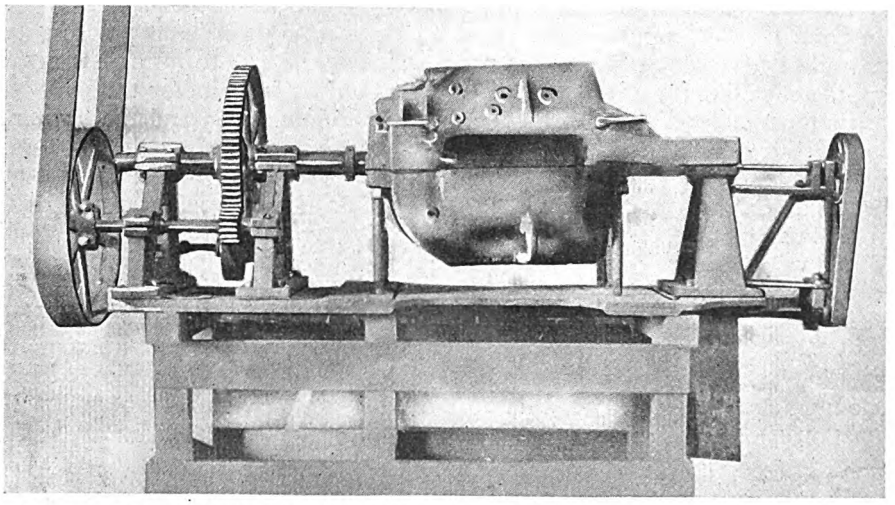
Maintenance Methods *and* Devices

Thorough Overhauling Reduces Defects

By C. W. Wood

Master Mechanic Virginia Public Service Company, Hampton, Va.

IN overhauling car equipment used by the Virginia Public Service Company it is our practice to put equipment in the best shape possible. Cars are shopped on a 75,000-mile schedule. At this time all equipment is removed, trucks and motors are dismantled and all worn truck parts are repaired by welding or are replaced by new parts. Motor and truck parts are cleaned by boiling in Okite cleaner. Brake levers and pins are case hardened. Manganese wear plates are installed wherever permissible in such places as for bolster chaffing plates and pedestal gibs. All loose bolts are replaced with new ones and every precaution is taken to put the trucks in as good condition as when new. After assembly the truck is painted with a good underframe black by the spray method.



Fixture used for reboring housing seat in Westinghouse type 101 B motors. Frames are built up by arc welding and are rebored to take standard housings

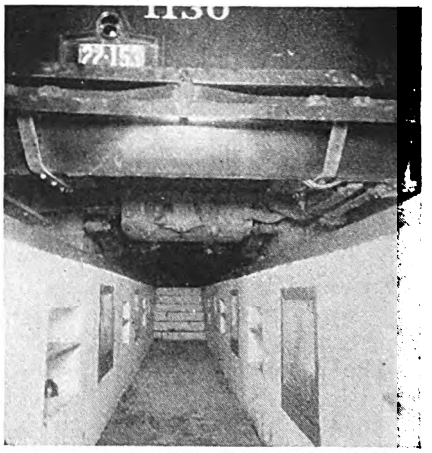
Motors are also dismantled completely. Armatures, brush-holders and field coils are removed, and after testing and the necessary repairs are made the armatures and fields are dipped in baking varnish and baked for 72 hours at about 100 deg. C. All bearings are replaced with new metal. Motors are given a running test on the shop floor before being mounted on the trucks. The current for running the motor on test is supplied by a motor-generator set, which is also used for arc welding. After the equipment is reinstalled the cars are given a running test of several miles before going into regular service. With this thorough method of overhauling we seldom find it necessary to change a piece of equipment other than brake shoes and cars remain out over the entire overhauling period of 75,000 miles. Cars are inspected on a 1,000-mile basis between regular overhauling periods. At this time brake shoes are changed, the equipment is oiled and minor truck repairs are made to keep parts tight and in proper operating condition.

Pit Construction for Bus Overhauling

By Robert M. O'Brien

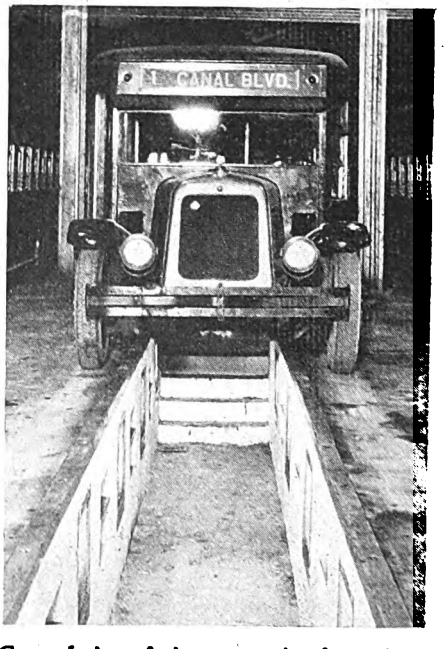
Superintendent of Rolling Stock and Shops, New Orleans Public Service, Inc., New Orleans, La.

THE pit construction used in our bus garage has some particularly interesting features. The pits are 4 ft. deep, 3 ft. 10 in. wide and 45 ft. long. Steps are constructed at either end in order to assist in entering and leaving. These steps extend lengthwise of the pit 4½ ft. at each end, leaving a total distance of 36 ft. which has a 4-ft. depth. Our longest buses are 30 ft. long, so that with a bus over the pit there is a space of 6 ft. left in which a pit hoist may elevate heavy automotive parts to remove them from the pit.



Light receptacles have an inclined reflector to throw the light upward

Particular attention has been given to the illumination of the pits. Large pockets are built in the pit walls on 8-ft. centers. The pockets are staggered so that there are five on



General view of pit construction from above

Four-inch guard rails are used at either edge of the pit, the width of which is the maximum that can be used, and the dimensions given above apply only to our wide gage buses. Others have to use a narrow gage pit. The depth of 4 ft. has proved most suitable for working conditions. The pit floor is sloped to one end, where a sump is provided which is covered by grating.

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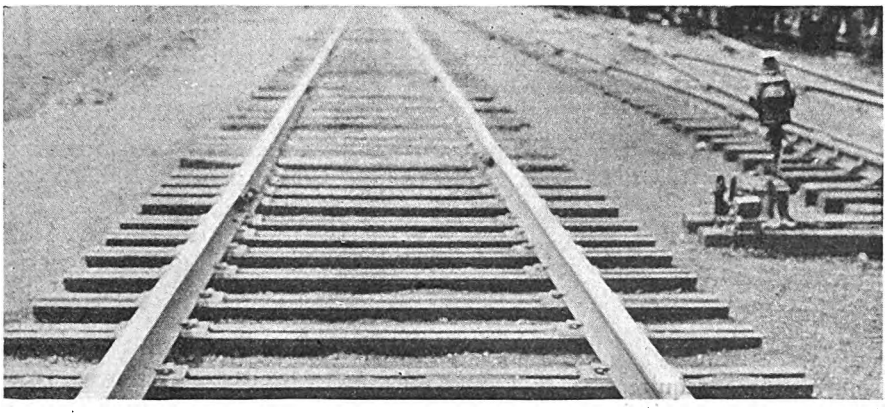
one side and four on the other. Projectors with 200-watt lamps and diffusing lenses protected with wire netting throw the light upward to the underside of the bus. The pit lamps are in two circuits so that only half need be lighted. Tool pockets in the pits are staggered opposite the pit lights. Due to the mild climate in which we operate no heating of the pits is required, and as the garage doors can remain open throughout the year no additional ventilation is needed.

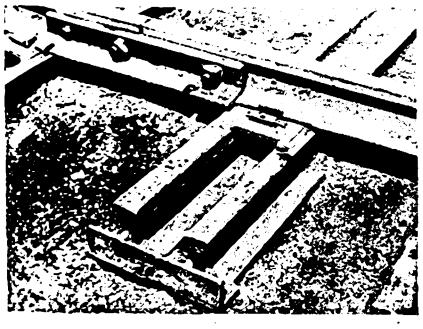


A section of track using the metal ties

Scrap Rails Used for Railroad Ties

METAL railroad ties constructed by arc welding worn rails are being used by the Delaware & Hudson Railroad for yard and siding tracks. The design was developed by H. S. Clarke, engineer maintenance of way for the Delaware & Hudson Railroad, in collaboration with engineers of the General Electric Company.

Two rails are used for each tie. The two lengths are fastened together at each end by metal plates which are welded in position. L-shaped angle bars used with ordinary rail joints can be used for this purpose. When two rails are fastened together movement of the tie in any direction in the ballast is eliminated.



Close-up of one section of track to show details of tie construction

For fastening the track to the tie metal plates are welded to each tie and the track is clamped to these with special clamping devices. As the edges of the tie plates are placed over the center of the top flange of the tie bars the wave action of the rail throws the load directly over the webs of the tie beams instead of on the outer edge of the flanges. This construction reduces the number of rail clamps to a minimum.

The cost of fabricating a metal tie of the type shown is 60 cents and the scrap value of the tie is $2.50, making an over-all cost of $3.10. Inasmuch as the scrap value can be realized out of the rail when it is later discarded from service, the net cost of the metal tie is reduced to the cost of fabrication, or 60 cents. Present applications have been confined to yard and siding service. This requires more than 30,000,000 ties a year for replacements.

EARN—*while others learn*

PRIZES TO BE AWARDED

First—$200 Second—$100 Third—$50

Monthly Prize—$25

FAVORABLE comment has been received from the heads of several maintenance departments on the educational feature of the ELECTRIC RAILWAY JOURNAL'S Maintenance Prize Contest. The fact that certain articles are submitted in the contest draws increased attention to them so that they are read the more widely and studied the more carefully. The result is that the best ideas are being put into practice on many railways. This interest also has the effect of focusing the attention of maintainers on the particular practices that they are using. They analyze their methods and compare them with similar ones published to see if they excel or if they can be improved.

When a railway employer finds that the method or device in use on his property has particular points of excellence he is doing a service to the industry by sending it in for publication so that others can profit by the economies that result. The number of articles submitted is far above that expected by the editors and the ingenuity displayed in some of them is remarkable.

The third installment will be published in the July 16 issue of ELECTRIC RAILWAY JOURNAL. Though they cannot all be published this month, articles should reach the editor not later than July 9 in order to give sufficient time to make cuts and have them available for publication among those that will be judged for the third monthly prize of $25.

The announcement of the winner of each monthly contest will be made in the third issue of the month following the one in which the items are published. Winners of the capital prizes will be announced in the Annual Convention Number, to be published in September, 1927.

Send in your ideas at once!

Here are the rules in brief:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated prior to Aug. 1, 1927. For the monthly prizes manuscripts will be received until April 30, 1928.
7. Illustration material may be in the form of drawings, sketches, blueprints, or photographs. All sheets should be marked "Maintenance Competition."
8. Details of the conditions not given above will be found in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

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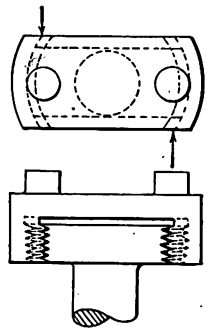
New Equipment Available

Bus Steering Made Easy with New Device

A MECHANISM provided with a control shaft at one end and a work shaft at the other which operates to provide a mechanical torque amplifier is a recent development of the Bethlehem Steel Company. The control shaft requires but a feeble torque to operate it in either direction, while the work shaft yields a



Diagrammatic view of lashlock. The principles used in this backlash eliminator may be applied also to take up play in push rods of motor vehicle engines

torque of sufficient amount to accomplish the desired purpose and at the same time follows accurately the control shaft in all of its angular movements.

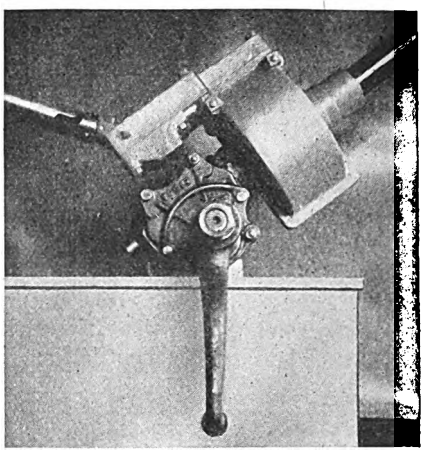
The three elements of the torque amplifier are a work shaft, a control shaft and a drive shaft. The drive shaft is driven by an outside source of power such as an electric motor and revolves continuously in one direction. The control shaft is actuated by any mechanical or manual control means and the work shaft is coupled directly to the work to be done.

When applied to a bus steering control, as shown in the accompanying illustration, the torque amplifier appears as a drum-shaped case just above the steering gear reduction. The shaft projecting to the left goes to the end which furnishes the outside power required to operate the device. In addition to this drive shaft from the engine, a work shaft is coupled directly to the steering gear inside this case and the control shaft is coupled to the main steering post.

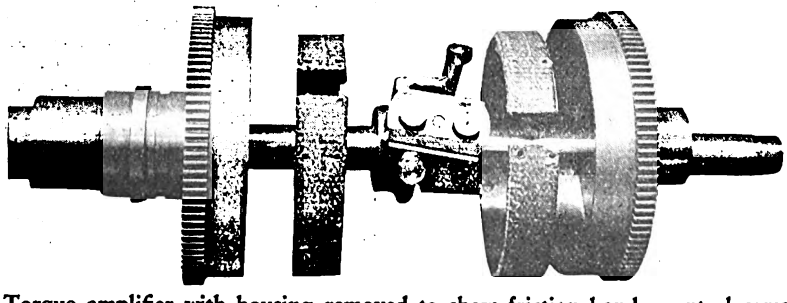
By use of the drums and the friction bands which may be brought into contact with them through the actuation of the control shaft, the steering wheel can be moved freely in either direction with but a small amount of effort. In devices of this sort already constructed the ratio between the torque applied and delivered from control to work shaft ranges from 1 to 10 up to 1 to 50,000.

In the exposed view of this mechanism another device is shown which is known as a "lashlock." It is intended to eliminate backlash automatically and is used to avoid the exceedingly close tolerances and the alterations due to heating and wear in service that would otherwise occur with the torque amplifier alone. It is necessary to have close adjustment, so that in reversing the direction of the control shaft the bands on one side may grip just when the bands on the other side release.

The lashlock consists in principle of a wedge-shaped member with rollers pressing against it from opposite sides. The principle is carried out in the amplifier by a member with projecting studs fitting into another cup-shaped member. These are placed on the sides. Pressure on one lug only produces a cocking effect which causes frictional lock and prevents rotation. All of the pressure on the one lug therefore acts to move the stem in the direction in which the lug delivers the pressure. The effect is the same as when one tries to open a bureau drawer by pulling one handle only. Pressure on both lugs corresponds to pulling the two handles together



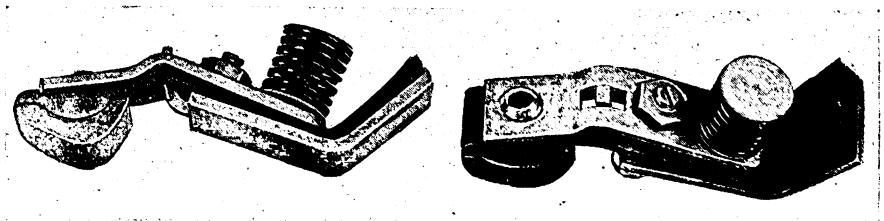
Application of torque amplifier to steering gear. Drums are driven from an engine connection as shown at the left. Steering gear proper is not disturbed



Torque amplifier with housing removed to show friction bands, control arms and lashlock for eliminating backlash

Improved Compensating Fingers

COMPENSATING controller finger of the new type being marketed by the Westinghouse Electric & Manufacturing Company results in a reduction in maintenance expenses and in the number of service interruptions due to broken or burned fingers. The feature of design consists chiefly in a spring movement obtained by the action of a helical steel spring between two steel members, one of which is used for the mounting finger, the other for carrying the contact tip. A rolling action between the two provides for maximum contact at all times.



The rolling action provided for the contact tip insures full width contact

Rugged construction eliminating breakage, self-aligning and maximum contact, reduced finger pressure, increasing the life of the finger, and the elimination of burned fingers, due to the fact that the spring does not carry current, are other improvements contained in this new design of compensating finger.

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Association Activities

New York Association Discusses Conservation of Street Space

Program at Annual Meeting Also Covers Equipment Developments, Overhead Construction and New Shop Construction

LEADERSHIP in bringing about more efficient use of existing street facilities was urged upon electric railway men by E. J. McIlraith, speaking before the 45th annual meeting of the New York Electric Railway Association, held at Bluff Point, New York, June, 24, 25, 1927. Other subjects considered during the meeting included recent improvements in car design, presented by F. M. Brinckerhoff, consulting engineer Brooklyn-Manhattan Transit Corporation; trends in overhead construction, by L. W. Birch, engineer Ohio Brass Company, and general design features of the new B.-M.T. Coney-Island shops, by W. G. Gove, superintendent of equipment of that company. Both Mr. Brinckerhoff and Mr. Gove used lantern slides to illustrate their subjects.

Conditions in the electric railway industry were reviewed and interpreted by Managing Director L. S. Storrs of the American Association. "The outstanding development today," he said, "is the improvement in morale of our own people." Actual experience figures show that the larger electric railway properties of the country have decidedly turned the corner and are headed for improvements in service and earnings, according to Mr. Storrs. Although this improvement has not extended so generally to properties in smaller cities, he felt that even there many indications point toward a reversal of the previous trend and an era of increased usefulness and prosperity for transportation companies. One outstanding development to which Mr. Storrs called particular attention is the increased confidence in the future on the part of railway managements generally. Further improvement was also predicted from the tendency on the part of the public to look with more favor on electric railway securities and the consequent reduced resistance and better terms under which some properties have been able to obtain new money.

Abstracts of the paper presented by Messrs. E. J. McIlraith and W. G. Gove are published in this issue. A paper by L. W. Birch on overhead construction will appear in a future issue.

Speaking extemporaneously, to supplement his prepared manuscript, Mr. McIlraith declared that electric railway men have a responsibility regarding street congestion relief which they have so far failed to assume. As transportation men, he held that they are particularly fitted to deal with this problem, which is an acute one even in smaller sized cities. The very baffling complexities of the situation throughout the country, which have defied the efforts of public officials, offer trained transportation men the opportunity for assuming leadership and rendering an outstanding service to both their communities and companies.

Two factors essential to the success of such an effort were emphasized by the speaker. First of these is the need for a thorough study and adequate preparation to deal scientifically with the many elements that affect traffic movement and street capacity. With this as a starting point, Mr. McIlraith laid particular emphasis on the importance of maintaining an absolutely unbiased viewpoint, having in mind always the general community's best interests. Real leadership, he maintained, can be won only through public confidence, which in turn is built on demonstrated sincerity of purpose and ability. Once railway men adequately fit themselves to bring about maximum usefulness of streets for all those who are dependent on them as traffic arteries, and have won public confidence through demonstrated sincerity of purpose, they may readily assume leadership by working through associations of commerce and other business and civic organizations. Mr. McIlraith cited the experience of the Chicago Surface Lines to demonstrate the advisability and soundness of such a program.

Methods followed in Rochester in making a traffic survey and some of the information disclosed were outlined by L. R. Brown, engineer New York State Railways, in discussing Mr. McIlraith's views. This survey was conducted by the traffic committee of the Rochester Engineering Society, using Boy Scouts for the collection of data. Some of the recommendations made by this committee were listed. One of these was the complete elimination of parking in the downtown district between the hours of 4:30 p.m. and 6:30 p.m. Checks made of the parked cars in the business district demonstrated the difficulty of enforcing limited parking restrictions.

Ernest A. Murphy, general manager United Traction Company, Albany, N. Y., described a survey made in that city. He called attention to the evils resulting from unwise, ill-considered and excessive traffic signal installation. Proper planning as to the arrangement, location and timing of signals was held to be essential to their intelligent use. Serious delays and waste of time, accompanied by restricted usefulness of street space, result from promiscuous and erratic signal installation.

In the absence of C. E. Morgan, vice-president Brooklyn City Railroad, the traffic situation in that densely populated community and the methods found necessary for expediting street car movement were presented by A. L. Hodges, assistant to the general manager. His paper is abstracted elsewhere.

W. E. Thompson, vice-president Third Avenue Railway, New York, complimented Mr. McIlraith on the work done in Chicago toward the scientific improvement of street traffic conditions. He mentioned particularly the value of the progressive control system which resulted from the studies made in Chicago.

Recent Car Developments

In his presentation of recent developments in electric railway equipment, F. M. Brinckerhoff described the experimental car developed by the Springfield Street Railway and the articulated cars of the Washington, Baltimore & Annapolis property. He also mentioned the "triplex" cars developed for the B.-M.T. subway system, the new cars of the New York, Westchester & Boston Railway, new suburban cars of the Pennsylvania Railroad for service in the Philadelphia area and recently acquired locomotives of the Virginian Railroad and the Great Northern. Mr. Brinckerhoff illustrated by lantern slides some of the features of these various units, which

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 11-14—American Society Civil Engineers, convention, Denver, Col.

July 22, 23—Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Sept. 8—Central Electric Railway Master Mechanics Association, South Bend, Ind.

Sept. 13-15—International City Managers Association, Dubuque, Ia.

Oct. 3-7—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.

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previously have been described in ELECTRIC RAILWAY JOURNAL. Representatives of the Timken-Detroit Axle Company discussed some of the features of design in the Springfield, Mass., worm-drive car. In answer to a question, W. L. Harwood, engineer of power and equipment Springfield Street Railway, said that the unsprung weight in the experimental worm-drive car is approximately 100 lb. per wheel less than the lightest form of conventional street railway truck with the same motor capacity.

David I. Walsh, United States Senator from Massachusetts, speaking at the dinner on Saturday evening, stressed the importance of co-operation among electric railways in meeting their difficulties. These, he said, are as serious as those faced by any industry in the country, and can be overcome only through united effort.

W. G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Company, New York, was unanimously elected president of the association for the coming year; W. E. Thompson, vice-president Third Avenue Railway, New York, was elected first vice-president; Ernest A Murphy, Albany, second vice-president; R. R. Hadsell, Rochester, third vice-president, and W. F. Stanton, Rochester, secretary-treasurer. Frank Hedley, H. B. Weatherwax, J. F. Hamilton and S. W. Huff were re-elected members of the executive committee.

Coney Island Shops of the New York Rapid Transit Corporation*

By R. A. MARSHALL†
Supervising Engineer Shop Equipment

WHAT are known as the new Coney Island shops of the B.-M.T. lines are now approaching completion. These shops and yards are located in Brooklyn between the Sea Beach and Culver lines of the railway and extend from Avenue X south to Coney Island Creek. Connections will be provided to the Culver, Sea Beach and West End lines and through the Coney Island terminal to the Brighton Beach line of the railway. The shops will replace the present inadequate shops located at 39th Street and East New York. They are designed to maintain 2,000 subway cars in service and liberal provision is made for the expansion of each department to meet the future demands. The preliminary plans were developed by the railway with the assistance of the engineering firm of Dwight P. Robinson & Company. They were turned over to the Board of Transportation, by which the building plans and contracts were prepared. The equipment plans and specifications, including selection of machines, were made by the railway.

The buildings comprise the inspection shed, main repair shop, store house, oil house, boiler house, office building and electrical repair shop. They have a total floor area of 546,000 sq.ft., or about 13 acres; the approximate cost of the entire plant as provided under the dual contract was estimated as $12,000,000, but with extensions provided for the ultimate cost will be considerably greater.

The building site is on the old marsh along Coney Island Creek. Most of this area was filled with subway excavation from a depth of 7 ft. to 12 ft. a number of years ago. The settlement of this fill had displaced the underlying mud in many places and had formed mud waves, which made an unsatisfactory foundation. The site was graded and the surcharge moved into the low and unfilled portions. Concrete piles were then driven for the support of the building structure.

STEEL AND BRICK USED

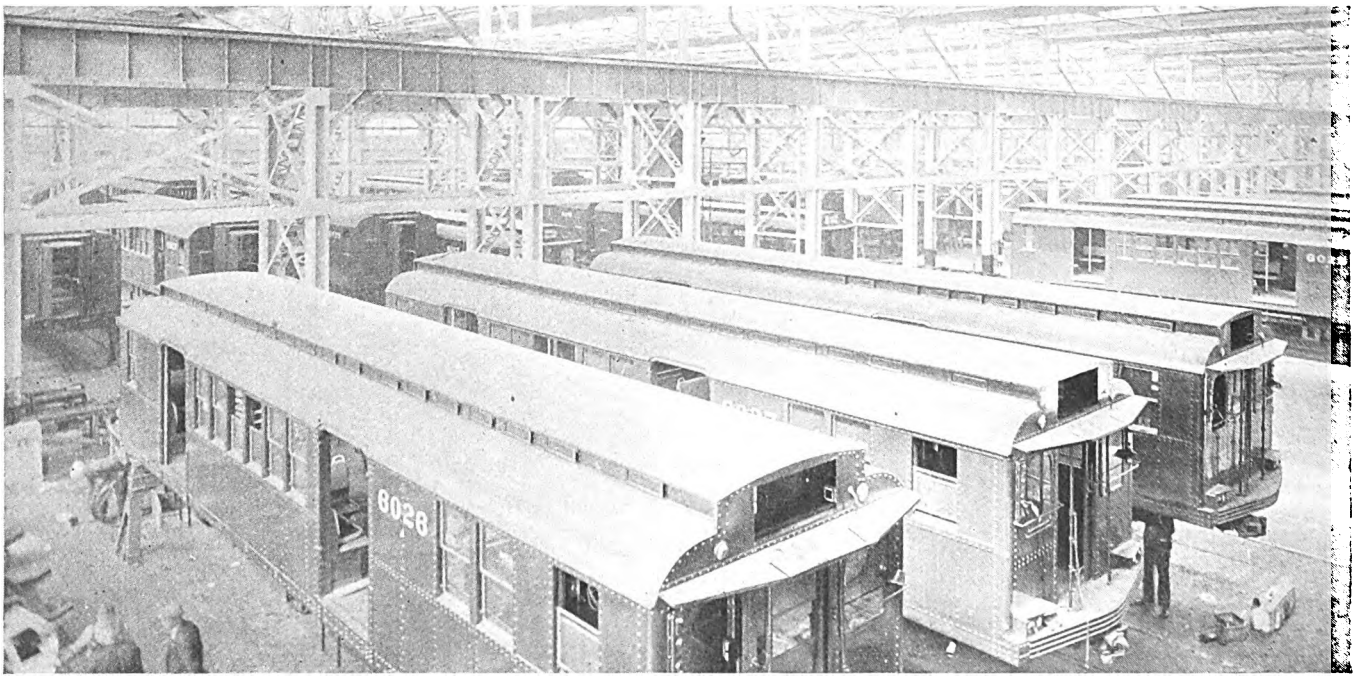
The building construction consists of complete structural steel frames with brick walls, steel sash and concrete roof slabs covered with five-ply roofing. The buildings have large side wall sash and the roof, which is flat, consists of alternate high and low panels supported on the bottom and top chords of the roof trusses. At each truss there is a continuous line of top hung sash, inclined at an angle of approximately 27 deg. to the vertical, thus distributing ample natural illumination to all parts of the buildings. The overhead sash, skylights and movable ventilating sections of the side wall sash are glazed with ¼-in. wire glass; the other side wall sash is glazed with ¼-in. rough glass. All ventilating sections of windows and skylights are arranged to be operated from the floor.

The electrical repair shop was the first building to be constructed as it was needed to replace the old shop at 52d Street. This was described in ELECTRIC RAILWAY JOURNAL, issues of Dec. 18, 1926, and Jan. 15, 1927. The other main buildings are approaching completion.

The inspection shed on the west side

*Abstract of paper presented at annual meeting of New York Electric Railway Association, Bluff Point, N. Y., June 24, 1927.

†Presented by W. G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Lines.



Interior of car repair shop. The cars are sections of new articulated units

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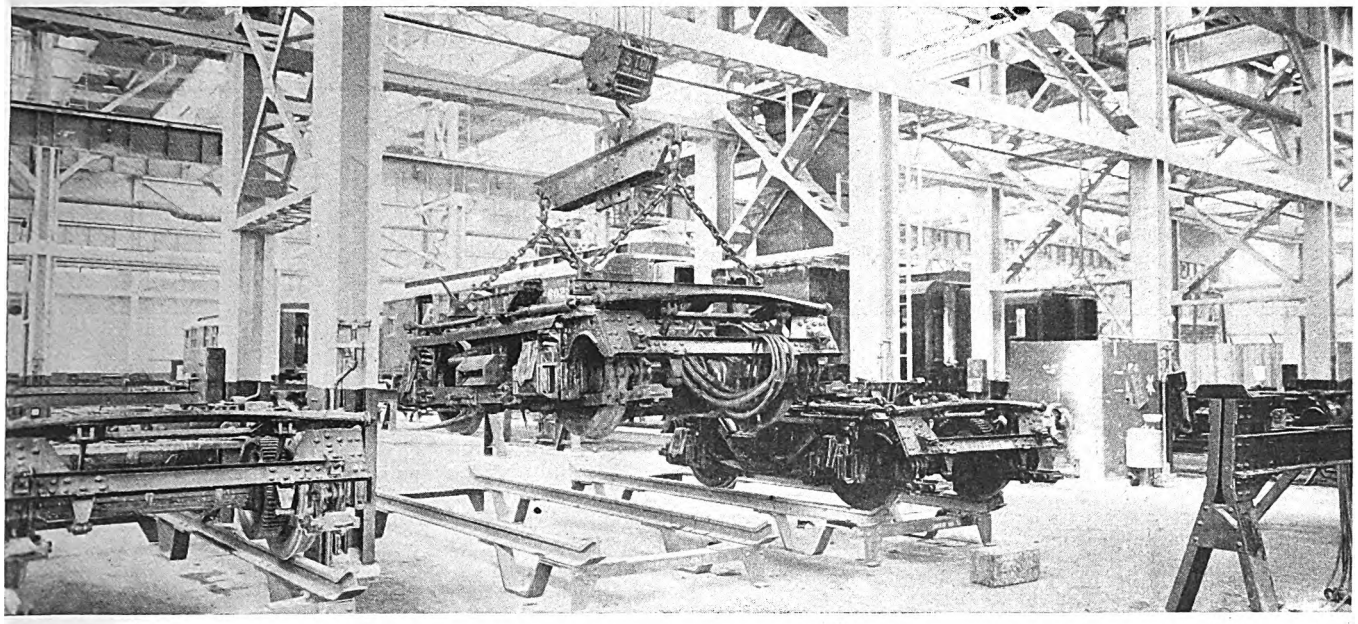

Special slings are used in lifting and handling trucks to raised stands for repairs

of the group is 86 ft. wide by 600 ft. long and has four tracks with pits, bench space and storage room. Cars leaving the repair shop pass through the inspection shed for final inspection and adjustment of brake rigging, etc., before entering service.

The west side of the main shop building, known as the intermediate repair shop, will be used for truck and running repairs. This building is 80 ft. wide by 480 ft. long with two tracks connected to the yard at each end. Each track will be equipped with a drop type transfer table, by which damaged trucks can be removed and good-order trucks replaced under cars. The central bay of this building, 43 ft. wide, will be used for truck overhauling and repairs and is equipped with two 15-ton cranes.

The south end of the main building is one large room, 255 ft. long and 520 ft. wide. It is divided into three 75-ft. bays, extending east and west, with 10-ft. trucking aisles between the same. Each 75-ft. bay is served by a 30-ton overhead crane equipped with two 15-ton trolleys. The tracks in this building are 20 ft. apart. The track along the west wall will be used for high-tension test purposes, the testing unit being located on a platform above the track. Adjacent to this track and occupying the west end of the building are nine tracks, or space for 27 cars, providing for repairs to damaged cars and for car construction work. The central part of the room is assigned for scheduled car overhauling. For this purpose the cars will enter the shop from the south on the stripping track and the car bodies will be removed from the trucks by the overhead cranes and placed upon specially designed steel horses which are high enough to permit ready access to the equipment under the car body and without the use of pits. The trucks will continue through on the stripping track to the truck shop in the north end for overhauling. Seats and equipment parts will be removed from the car body and transported by storage battery trucks to the appropriate departments for repairs. After repairs have been made the car body will be moved by the overhead crane to the east end of the building, where it will be painted, then taken again by crane to the wheeling and trim tracks, where it will be placed on the trucks coming out of the truck repair shop.

In order to keep the shop as clean as possible, cars before entering the repair shop will be cleaned in the cleaning room at the southeast corner of the building. As this shop is essentially a steel car repair shop, the wood mill and carpenter shop are of minor importance as compared with the usual shop. This work is accommodated in a one-story building 40 ft. x 230 ft. directly east of and connected to the paint shop and transfer bay.

Transfer Bay Connects the Departments

The north end of the building is devoted to truck overhauling, machine and blacksmith work and miscellaneous repairs. Between these departments and the scheduled car repair shop there is a cross transfer bay 40 ft. wide and 640 ft. long, served with two 15-ton cranes at a height of 30 ft. This transfer bay furnishes cross-movement and direct access to every department of the shop. The cranes north of the transfer bay are at a lower level and extend into the transfer bay for ready exchange of loads from one crane to the other. Between the transfer bay and the scheduled car repair shop is an area 60 ft. wide by 560 ft. long with a mezzanine floor 40 ft. wide above. On the ground floor are located departments for rigging, sheet metal work, electrical construction work, pipefitting and shoe beam work. These departments are thus located close to the car repair work. Storage of parts and supplies are also located in this section. On the mezzanine floor curtain and sign work and seat cleaning and repairs will be done.

The northeast corner of the building, which is nearest the entrance, provides accommodations for employees. This room is equipped with 32 circular Bradley wash fountains, each capable of accommodating eight to ten men at one time. Space is also provided for 1,000 of the railroad company's standard metal clothes lockers, which are 12 in. x 18 in. x 6 ft. high. Directly south of the wash and locker room a first-aid room is provided. This will be equipped with the usual first-aid room facilities. The upper floor over the wash and locker room, 60 ft. x 200 ft., and on the same level as the shop mezzanine, is allocated for lunch room and recreation purposes. Toilet facilities are provided in rooms on the mezzanine with direct stairway access from the main floor. Isolated urinals are provided at frequent and convenient locations on the main floor throughout the shop. Drinking fountains are also provided at convenient locations throughout the shop. These fountains have an ice chamber with coil, thus providing cold water for the employees.

East of the main shop there is a two-story fireproof storehouse 60 ft. x 300 ft. and designed for a future third story. The second story is connected to the main shop by a bridge on the mezzanine level, by which truckloads of material can pass through the mezzanine of the main shop and over a second bridge into the inspection shed. Elevators of 10,000 lb. capacity are provided in the store house, main shop and inspection shed. The elevators have 8-ft. x 12-ft. platforms and a speed of 75 ft. per minute. The control is of the push-button type, thus dispensing with the need of operators.

East of the store house are located the oil house and office building. The oil house is a one-story-and-basement building, the basement being devoted to tank storage of lubricating oils, with space for waste, etc. An elevator handles material to and from the basement. The main floor will be occupied

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by oil pumps, barrel racks with tiering machine, etc. Part of this floor will be used for the renovation of waste, the treatment of journal box packing and paint and paint brush storage. The distribution of the lubricating oils to this large plant has been given special study and the Bowser system used throughout. Oils will be received in tank car shipments, unloaded through fill pipes to tanks in the basement and then pumped by motor-driven pumps to various stations throughout the shop where the oil will be drawn for use. At each of these stations will be located 120-gal. tanks with hand pumps for drawing oil. The supply of oil from the oil house to these small tanks is controlled by remote control valves at each tank. When necessary to replenish the supply of oil in a distribution tank the operator opens the remote control valve, which automatically starts the oil pump in the oil house. Oils that are used in small quantities will be transported in drums or portable tanks on storage battery trucks.

The office building is fireproof, 50 ft. x 110 ft., two stories in height and planned for a future third story. This is located close to the entrance gates and will house the offices and drafting room of the mechanical department. Two vaults are provided for storing drawings and records. There will be a gatehouse with a waiting room and employment office at the yard entrance, where will be stationed a watchman.

Heating is provided from a central heating plant located in a separate building, the equipment consisting of two 400-hp. Heine water-tube boilers equipped with Bethlehem-Dahl oil burners and capable of operating at 200 per cent rating. Space is also provided for two additional boilers. Sea grade fuel oil is used and storage is provided in three 8,500-gal. tanks buried in the yard. The boilers are connected through overhead flues to an 8-ft. x 200-ft. radial brick stack. Steam is generated at 160-lb. pressure and distributed at this pressure through mains to pressure reducing valves, where the pressure is reduced to 5 lb. The shops are heated by 71 unit heaters containing heating coils and electrically driven fans. The regular 600-volt d.c. railway current, furnished through a separate feeder from the Avenue U substation, is used for light and power.

Although the buildings are either fireproof or of non-burnable construction and the shops are to be used for repairing steel cars, fire protection has been given consideration by the provision of an 8-in. water main loop around the shops and connected to the city mains. In addition to the yard hydrants, interior standpipes with hose are provided throughout the shop. In the oil house there are also high-pressure steam pipes with outside control valves for smothering fire inside of the building.

The machine tool equipment has been given special study by the tool committee, which has recommended equipment suitable for maintenance.

Five Causes of Traffic Congestion*

By A. Leroy Hodges
Assistant Secretary Brooklyn City Railroad

EXPERTS have agreed on five principal causes for "Traffic Congestion."

1. *The many-floored office buildings.* Contrary to general belief, we have them in Brooklyn, too. We have a new building of 35 stories. And now I read in the New York *Times* of June 21 that the Broadway Association of Manhattan is considerably worried over the serious traffic problem created by the proposed 110-story Larkin Tower on West 42d Street. It is said by the traffic committee of this Broadway Association that each floor of a large office building adds 1,000 persons to the crowds to be handled.

2. *Insufficient roadway and sidewalk space.* On reconstruction jobs, in many instances, cities are widening the street area by cutting back sidewalks, on the theory of increasing lanes of traffic when almost immediately this additional space is occupied by parked vehicles—and where parking is permitted the general results as far as facilitating movement of traffic are nil.

3. *The ever-increasing number of automotive vehicles.* The total registration of automobiles in the five boroughs of New York is in excess of 600,000, to which must be added the thousands of vehicles that come in daily from other parts of the country.

4. *Failure to provide sufficient paved roadways and to maintain them.* Often you will find the street area maintained by the railroad to be the best roadway for auto travel and, of course, it is used by the autos to the detriment of your railway service.

5. *The parking evil.* Deputy Chief Inspector Coleman in a talk before the Metropolitan Section, A.E.R.A., recently said that from his experience in the Traffic Division of the Police Department the greatest obstruction and the most frequent cause of delay to the free movement of traffic is inconsiderate parking, and he was referring to these long-time parkers.

As a matter of simple justice and common sense the rights and well being of the greatest number of people affected by traffic strangulation should receive first consideration. Surface cars carry 55 per cent of the total number of passengers carried on all transportation lines in the Borough of Brooklyn. Every student of the traffic problem realizes that the remedy lies in discouraging the use in congested sections of the inefficient carrier and encouraging the efficient carrier, the one which transports the most people by utilizing the least amount of roadway space. At present the reverse of this principle is being applied.

A pedestrian walking along the street requires 10 sq.ft. of street space, an automobile standing or parked requires 100 sq.ft., and if moving slowly requires 200 sq.ft. If this same automobile is speeded up to 15 m.p.h., it requires 300 sq.ft. of roadway, and if operating at 20 m.p.h. it requires 400 sq.ft. of roadway. It is very apparent therefore that an automobile is a spendthrift when it comes to wasting roadway area on the basis of space occupied per passenger. The parking prohibition will not only have the effect of opening up new lanes of travel but will also discourage the use of the inefficient carrier, the one hauling on an average 1.7 passengers in the more congested sections where these prohibitions are applied.

The only reason why practically unrestricted parking is permitted is that certain shortsighted merchants have been able to exert a certain influence in favor of the practice. In their eagerness to encourage the parking of cars in front of their stores they forget that they are making these stores inaccessible to other potential customers who travel in private cars, in taxicabs, in street cars and in buses.

Few Store Customers Use Automobiles

In co-operation with some of the retail merchants of Brooklyn, a check was taken some time ago to determine what mode of transportation the patrons of these stores used, and it was discovered that less than 9 per cent came by private automobile, and yet these same merchants deplore any "no parking" restrictions which may be placed in effect.

If it is within the province of the Police Department to set aside certain street areas for limited or unlimited parking space, why can they not take the same viewpoint of the center of the street, especially on those streets where street car tracks are located, and keep them open for the free movement of mass transportation? If the parking was cut back 150 or 200 ft. from the corner so that automobile traffic could have the unrestricted use of the street between the car tracks and the curb, it would mean much in the handling of traffic.

As it is at present, with the parking to the building line and automobile traffic on the car tracks, it simply means that when traffic is resumed the movement of the street car, which is carrying approximately 85 per cent of the persons using the street, is restricted to the speed of the slowest vehicle, when such vehicle is occupying the track area.

Cruising taxicabs present another serious problem in that they retard the movement of traffic. These taxicabs do not want to move fast, and the chauffeur

*Abstract of paper before annual meeting New York Electric Railway Association, Bluff Point, N. Y., June 24, 1927.

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will hold back at busy street crossings, hoping to be stopped by signal, so that while standing waiting for the signal to proceed he will get a passenger. A quick trip through the crowded area without picking up a passenger means circling around and trying again, so that the policy of these taxi chauffeurs is to move as slowly as possible until they secure a fare.

It is up to us transportation men to educate our patrons and our citizens to the economic loss as a result of these conditions, but only until they are awakened to the situation can we expect its real solution.

Promoting the Best Use of City Streets*

By E. J. McIlraith
Staff Engineer Chicago Surface Lines

CONCENTRATION of business administrative agencies in relatively small areas in large cities has ample justification. From time immemorial cities have been the seats of trading and administrative power. Even today business prestige and business accomplishments are promoted by a city location that is conveniently accessible to those with whom one expects to do business. In spite of all rapid and convenient means of communication it is still vitally important that men have personal contact in order to do business best.

A city which is a strategic center within a great area of the country is an excellent location from which administrative, engineering, distributing and advisory control may most profitably be exercised over much of the activity of that area. It is not chance, but economic necessity, that centers such leadership in the various large cities. It is equally a necessity that these dominating forces centered in the city should concentrate in a small area in order to promote the effective use of the time of the individuals.

Manufacturing, certain retailing, warehousing and similar activities should, of course, be spread about appropriately and kept away from the central area.

There is vital need to provide facilities that will permit a close centralization of the leadership of the country, and no need of thinking it impossible to provide adequate accessibility for the large buildings or for the concentrated area in which these buildings are placed. We are, however, confronted more and more vividly each succeeding year with the threat of too serious congestion, and the very rapid rate of change in intensity of use of the central business area is making the problem of providing accessibility one that must be answered correctly at once.

A complete solution of the problem of providing accessibility involves improvements in transportation methods and facilities as well as the control of street use. The greater cities are planning and developing better rapid transit. In Chicago the use of an underground pedestrian level to permit pedestrians to have the whole street width to themselves without vehicular interference or weather inconvenience is a fixed part of the plan. Such a development is not expensive, but of enormous value in increasing the convenience of all movement and in using the central area to its maximum advantage. Some day moving sidewalks will be used to decrease the time and effort needed in moving horizontally in central business districts, as elevators and moving stairways serve for vertical movements. Concentration simplifies in many ways the problem of providing conveniences.

Railway Managements' Obligation

No organization or interest can be so vitally affected by, or should be so intensely concerned over, the development of traffic regulation and the promotion of the best usefulness for the streets as is the management of the transportation company. The company's business is that of transporting people. Its vital concern is in maintaining the highest degree of usefulness for its service. The management also has an unmistakable obligation to represent successfully the interests of the people whom it serves, and this is a major portion of the citizens living within the city. Each railway management is under obligation by the nature of its business to assume leadership in working out the traffic problem of the city in which it operates. Very few have assumed this obligation. Most railway managements are giving half-hearted support to a police department, or to whatever other casual body is attempting to control traffic.

The country's prosperity creates a widespread desire for the use of private automobiles for casual purposes, to gratify the longing for individual prestige and individual personal luxury. That is creating the present congestion. More people would drive cars daily if there were more streets.

Each citizen, including ourselves, finds it an advantage at times to use an automobile, and each at times finds it desirable to use a public conveyance. Yet, since one street car with 40 passengers carries as many people as 22 average automobiles, and one car carrying 60 passengers is equivalent to 33 automobiles, it is evident that with a growing number of people to be served an increasing proportion must use the public vehicles. It is the abuse of privilege in using private automobiles that must be controlled.

Traffic planning must, therefore, promote to the best possible extent the mutual interests of the various units using the street, giving special consideration to the greatest good to the greatest number and providing the maximum value to the community in the service rendered by the streets. That may sound like a glittering generality, but if each feature under consideration is made to pass scrutiny from this point of view explicit decisions are not so hard to make.

Many Causes of Interference

There are many features of street use that must be analyzed and considered in developing regulations and an appropriate traffic control plan. It is not sufficient to consider ways and means of moving traffic by signal systems or how to regulate turning movements. The whole problem consists in providing adequate regulation for each of the factors involved that is appropriate to the various locations within the city and to various hours of the day. Some of the items most prominent at this time are: Parking on city streets; the signal system or other intersection control; turning movements; pedestrian movements; segregation of types of vehicles; delivery of heavy material; loading and unloading of service vehicles; street blocking around buildings under construction; cruising of taxicabs or of chauffeur-driven cars; taxicab stands; sightseeing bus stands; street repair work; repair work in manholes; sidewalk obstructions; contour and condition of paving; radius of curb corners; location of loading zones for private automobiles, taxicabs, buses; detour trucking routes; training of drivers; development of a sense of responsibility with police forces and in courts toward control of carelessness on the streets.

Parking Waste Street Space

Parking is absolutely a desirable feature of street use in places, but a completely inexcusable waste in others. To be specific as to the latter, let me illustrate with figures from Chicago. There are 122,000 trips of vehicles into the central business section, less than 1 mile square, between 7 a.m. and 7 p.m. of a business day. Of course, this counts many trips for some vehicles, so that a considerably smaller number of individual automobiles, taxicabs, buses and service vehicles are actually appearing in this section on one day.

Of these trips only 18,200, or 15 per cent, can find parking space legally available, if each one uses that space for the prescribed half hour. Since it is utterly impossible to enforce a definite time limit, a much smaller number is actually able to use the parking space. The other 85 per cent or more are able, however, to do their necessary business without using street

*Abstract of address before annual meeting New York Electric Railway Association, Bluff Point, New York, June 24, 25, 1927.

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parking space. Many merely load or unload passengers or goods, many are passing through without stopping, and an appreciable number use off-street storage space. A careful check made by the business houses themselves shows that for 96,082 people interviewed in banks, stores, office buildings, restaurants, but not including the employees, only 1.57 per cent used curb parking space and the results were much the same in all classes of business. Now if so small a percentage is using the privilege of parking at the curb, is it an important proposition? If 85 per cent of the vehicles are able to serve their drivers' needs without using curb parking space, why shouldn't the other 15 per cent? What merchant or restaurant owner has set aside or could consider using any part of his building for free parking space for his customers? Yet space inside property lines is less valuable to the community or to the property owners than is the street space alongside that provides accessibility. Some merchants are taking the customers' cars at the store door and driving them to garages, but they cannot set aside garage space free in a busy business center. Yet custom has permitted the use of street spaces as in the days of the old hitching posts. With parking filling the curb lanes, as in all business centers of all cities, there is not sufficient opportunity for service vehicles, taxicabs or automobiles to pull quickly to the curb to load or unload. Much of this has to be done while the vehicle stands in the lane outside the line of parked vehicles, or on a crosswalk, or in front of an alley, or on the car track, or in fact wherever, in desperation, the driver finally concludes to take a chance.

The whole flow of business for 98.43 per cent of people is terribly handicapped in Chicago for the privilege of granting special convenience to 1.57 per cent who park. The speed of movement for the 98 per cent could be increased at least 50 per cent if the 1.57 per cent of people were made to do what the great majority of the automobile users have found it best to do. If an automobile has a value to its user, it must have a value greater than 50 and 75 cents or a dollar a day that it would cost him for day storage. It costs 10 cents to 20 cents per mile to own and operate an automobile. The owner making a single trip to a business center drives an average of at least 5 miles each way, and therefore spends for such operation from $1 to $2 per trip. If he is willing and able to do so his business and comfort must be valuable to him. Is it, then, not reasonable to expect him to add the cost of garage storage instead of turning the most valuable property in the whole city to his personal use, when such use prevents reasonable accessibility to the business houses and offices, cuts the usefulness of the street to half its normal capacity in most cases, and threatens to destroy the convenience of doing business in the present busy centers? Parking is an utterly inexcusable economic waste and handicap to business where the full street width is essential for moving traffic together with the controlled and unescapable loading and unloading of passengers and goods. Let us illustrate in another way. If in Chicago's Loop district each person entering loses ten minutes per day due to the congestion caused by parking, and this is low, the total time wasted is equivalent to 470 minutes, or nearly eight hours, for each automobile that may be parked legally within that area in the business day. Each automobile parking for a half-hour period costs eight hours waste of time for others, as a conservative estimate. On what basis can such a great economic nuisance be defended? Has any one ever compiled any statistics to show that parking is an economic necessity in busy districts or along busy streets? The freedom of movement in busy districts would be so greatly promoted if parking were eliminated that it would be the equivalent of an increase of fully 50 per cent in street width without any decrease in the available building area or of taxable land such as would result from actual street widening.

Some Parking Permissible

It is not necessary to eliminate parking over all streets adjacent to busy sections of a city. It is only necessary where traffic requires the full street for reasonable freedom of movement, and where space must be set aside for loading and unloading service vehicles, buses, taxicabs or private automobiles. Much harm can be done by over-enthusiastic limits to parking. Limitations at choking points, near all active intersections, on all streets where the volume of moving traffic requires the full street width for reasonable freedom of movement are absolutely necessary.

Correct use of a street having no parking involves also the prevention of loading or unloading of any vehicles, automobiles, buses or taxicabs within at least 100 ft. of an intersection. This is necessary so that the traffic may approach an intersection, which is always the controlling point limiting the street capacity, with all lanes from curb to curb available for their movement. It is quite important, too, that lanes be marked off approaching the busier intersections, so vehicles will align themselves to get the best use of the street width instead of spreading themselves carelessly about. This feature of providing loading space toward the center of the block and keeping the curb lanes free for at least 100 ft. back from an intersection is very effective in providing greater street capacity, greater freedom of movement, higher speed and improved safety.

Parking Regulation Not New

Parking restriction is not a new regulation and should not be presented as such. It has long been evident that parking on boulevards, in front of certain buildings or along busy streets in the busiest rush hours of traffic could not be for the best interests of the majority, and such restrictions are in effect in all cities. We have now to realize that the growing use of automobiles has created excessive pressure of traffic through all business hours of the day and on many more streets. City councils and traffic control authorities are slow to increase the restrictions unless pressed or furnished with adequate proof of the need. Proof is not hard to get for those areas where the restrictions are needed, yet it is difficult to get united pressure from civic or business groups, because they are not students of the problem and have colored opinions of the need for unlimited freedom of parking privilege. Each merchant hopes to get customers from those who park before his neighbor's store. He doesn't, however, study the relative value of parking compared to the damage from congestion.

This old idea must be dissipated by data and facts. Unlimited personal freedom is no longer possible in any phase of city life, and unrestricted parking in many sections seems entirely too violent an offense against the welfare of the citizens to be longer permitted. City life is becoming complex, but communication must be retained. There may come a time when, because of greater convenience and economy, private automobiles will be used very little in large cities unless chauffeur-driven, but all needing special personal service will use taxicabs, which have the advantage of being paid off and released for another customer as soon as one is delivered.

Allied with parking is the special privilege stand for taxicabs or sightseeing buses. Loading zones for these vehicles in common with other vehicles should be established and the taxicabs must be stored and kept waiting for call in off-street storage space. Push-button call service and telephone service must supplant the present method of crowding out all other vehicles in the neighborhood of hotels, railway stations or other places where many people congregate.

Unnecessary Street Blocking in Busy Hours

An extremely important source of trouble in creating street confusion is from the various forms of street repair work. There is rarely need for such work being done between 8 a.m. and 6 p.m. These hours should be kept for moving street traffic, that is the lifeblood of business life. There is altogether too much disturbance of traffic and business in the vicinity of buildings under construction, and good planning can eliminate most of the trouble. Delivery of heavy merchandise and bulky or heavy material should be prohibited in busy streets during the business day. There is no good reason why coal, ashes, general freight and general delivery service cannot move while the streets are virtually free of other traffic. Trucks traveling from one side of the city to the other should be moved on good detour routes outside the central district.

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The success of each city depends on the organization of its business so that its cost of distribution, costs of public improvements, costs of delays and comfortable living and doing business within the city are kept within reason. The present use of the city streets is not reasonably efficient, yet the streets are the most vital elements in permitting communication, and so in permitting city life. Streets are congested during 35 per cent of the time and vacant for the rest of the day. Before spending huge sums in street widening or in creating new streets, why not cut out some of the confusion in a simple way?

Chicago's Loop district is functioning better today than are the similar districts in most large cities. Much of the credit for this can be traced to the use of the Chicago tunnel system for handling the heavy freight, coal, ashes, excavations for building foundations and merchandise. There would be more than 5,000 more trips of trucks through the central district per day if the tunnel were not in use. Much other improvement has been developed by careful study, analysis and co-operation from the organizations having membership in the Association of Commerce.

Traffic Signals Help

Signal control has proved its value in reducing conflicts and promoting freer movement at intersections. Yet most of the signal control in use in this country has not been suitably adapted to give the best usefulness to the intersections or to the streets.

Signals are usually bought and sold as so much hardware, and the city administration is rarely willing to obtain technical advice on the most suitable type of control, the correct timing, the correct grouping of signals, or such other vital factors. Most signals are working under synchronous control, or where a synchronous control has been arranged to give reverse indications in alternate signals or in alternate groups of signals. Such signals are very rarely sufficiently effective and not only waste street capacity, but waste time for each person using the street. For a few dollars spent for engineering study and a slight increase in cost for equipment an appropriate signal system can be installed which will provide very much better operating conditions.

The co-ordinated traffic control method which was originated in Chicago provides maximum flexibility possible for any street arrangement, permits continuous movement throughout the controlled section and limits successfully the maximum speed that can be attained.

Traffic Enforcement Essential

In most cities at least there is too much tendency for both the police and the courts to belittle the importance of traffic code violations. The result is carelessness of drivers—undue exercise of personal whims in driving, parking, and ignoring the safety of others. It is such carelessness that costs hundreds of thousands of lives and much unnecessary suffering. Campaigns of education and pleas for safety are necessary, valuable, and must be continuous, but the fear of penalties and respect for a rigid justice is tremendously more effective. There must be an enforcement that is based on rigid, unflinching application of the laws that create safety for all users of the street.

May I recall again the most important feature I wish to leave with you, namely, that the railway managements must develop to be the acknowledged leaders in the technical job of traffic control. It is an obligation, a privilege, an opportunity, but there must be developed a thorough skill and a complete knowledge of principles. Traffic engineering requires competent men who are trained and experienced, but it is of outstanding importance in the modern city life.

Motor Vehicle Taxes Vary Widely in Different States*

By Henry R. Trumbower
Professor of Economics University of Wisconsin

OBTAINING adequate funds for the maintenance of highways has from time immemorial been a difficult and serious problem for communities. In the early history of this country it was found expedient by state and local governments to delegate the maintenance of the relatively more traveled roads to private organizations known as turnpike companies. In recent years, probably because of the more general and intensive use of the highways brought by the automobile, the pendulum of public opinion has swung in the opposite direction. Roads which were once maintained as toll roads have become free, and it is generally held that the work of constructing and maintaining highways is a governmental function.

In railroad theory and practice it is maintained that the costs of operation have to be met by the revenues contributed by those who benefit directly or indirectly from the services rendered. Such was the theory applied to highway users in the days of the toll road. But that theory was gradually abandoned as the turnpike mileage decreased from year to year till the time came when public roads and highways were improved and maintained by the public through taxation in the same manner as schools were supported out of public funds. That was substantially the situation at the time just preceding the advent of the automobile. The situation has changed again and now the motor vehicle, which has become the chief user of the highways, is looked upon as a source of revenue with which highway expenses are to be met—at least in part.

In 1926 the motor vehicle revenues of the country amounted to $408,103,568: 54 per cent of this sum was derived from license fees and 46 per cent from gasoline taxes. A study of these motor vehicle revenue figures shows that for the past five years or so the states have come to rely more and more upon the gasoline tax as a source of funds for highway purposes. Although more than half of the total motor vehicle revenues is derived from license fees, the proportionate amount received from gasoline taxes has been steadily increasing. At the close of 1926 all the states except four—Massachusetts, New York, New Jersey and Illinois—were collecting a gasoline tax in order to obtain highway funds. Not only has there been an addition to the number of states in the gasoline tax column, but those states which were among the first to enact gasoline tax legislation have in succeeding years in almost every case stepped up the tax rate per gallon, so that there are now two states which collect a 5 cents tax. In the early years the policy of licensing automobiles was clearly regarded as a policing measure, and the fee charged in connection with the issuing of a license and identification tags was supposed to be just enough to cover the expenses incurred in connection with the operating of the licensing department of a state. That policy was discarded long ago. It is now the accepted purpose of a motor vehicle license fee system, which by the way has received the sanction of the courts, to raise revenues which are to go toward highway construction and maintenance.

Gasoline Taxes Large

In 1926 there were seventeen states each one of which collected a larger amount of money from the gasoline tax than from the motor vehicle license fees. This is an indication of the trend of the times with respect to the relationship of the gasoline tax revenues to those derived from license fees. In some states where the gasoline tax has been introduced or where the rate was advanced there was a corresponding reduction in license fees, but that has been by no means the general practice. In these seventeen states the license fees and the gasoline tax collections totaled $148,414,727; 39 per cent license fees and 61 per cent gasoline tax revenues.

The states have not yet worked out any uniform policy as to the relationship which each one of these methods of raising funds from the motor vehicle is to bear to the other. There is no doubt that a good deal of haphazard and

*Abstract of address presented at the annual convention of the Motor Bus Division, American Automobile Association, Philadelphia, June 16, 1927.

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TABLE I—LICENSE FEE AND GASOLINE TAX PAYMENTS FOR FIVE-PASSENGER CAR, 3,000 LB., 24 HP., PRICE $1,075, 400 GAL. GASOLINE CONSUMED—1926

State	License Fee Amount	License Fee Per Cent of Total	Gasoline Tax Amount	Gasoline Tax Per Cent of Total	Total
Oregon	$40.00	77	$12.00	23	$52.50
Arkansas	22.93	59	16.00	41	38.93
Kentucky	18.00	47	20.00	53	38.00
South Carolina	15.00	43	20.00	57	35.00
Virginia	16.80	48	18.00	52	34.80
Idaho	22.00	65	12.00	35	34.00
Minnesota	25.80	76	8.00	24	33.80
Vermont	25.50	76	8.00	24	33.50
Oklahoma	21.12	64	12.00	36	33.12
West Virginia	19.00	58	14.00	42	33.00
South Dakota	20.00	62	12.00	38	32.00
Florida	15.00	48	16.00	52	31.00
Iowa	22.75	74	8.00	26	30.75
Mississippi	14.40	47	16.00	53	30.40
North Carolina	12.50	44	16.00	56	28.50
Georgia	14.40	51	14.00	49	28.40
North Dakota	19.15	71	8.00	29	27.15
Montana	15.00	55	12.00	45	27.00
Washington	19.00	70	18.00	30	27.00
Nevada	10.87	40	16.00	60	26.87
Maine	13.50	53	12.00	47	25.50
Connecticut	16.96	68	8.00	32	24.50
Michigan	16.50	67	8.00	33	24.50
Missouri	16.50	67	8.00	33	24.50
Louisiana	16.32	67	8.00	33	24.32
New Mexico	12.00	50	12.00	50	24.00
Tennessee	$12.00	50	$12.00	50	$24.00
Wisconsin	16.00	66	8.00	34	24.00
Texas	19.20	83	4.00	17	23.20
Delaware	14.50	64	8.00	36	22.50
Wyoming	12.00	55	10.00	45	22.00
New Hampshire	13.12	62	8.00	38	21.12
Kansas	13.00	62	8.00	38	21.00
Nebraska	13.00	62	8.00	38	21.00
Rhode Island	15.37	79	4.00	21	19.37
Alabama	11.25	58	8.00	42	19.25
Indiana	7.00	37	12.00	63	19.00
Utah	5.00	26	14.00	74	19.00
Pennsylvania	9.60	55	8.00	45	17.60
Arizona	5.00	29	12.00	71	17.00
Maryland	7.68	49	8.00	51	15.68
New York	15.00	100	.....	..	15.00
Colorado	5.37	40	8.00	60	13.37
Ohio	4.00	33	8.00	67	12.00
California	3.00	27	8.00	73	11.00
Massachusetts	10.00	100	.....	..	10.00
New Jersey	9.60	100	.....	..	9.60
District of Columbia	1.00	11	8.00	89	9.00
Illinois	8.00	100	.....	..	8.00
Average	$14.50	60	$9.92	40	$24.42

compromise legislation has been enacted along these lines. Great variations in the gasoline tax rate are noted. In addition there are many different principles and methods followed by the several states in classifying passenger automobiles and other types of motor vehicles for the purpose of determining the amount of license fees to be charged, and the fee for the same type or class of vehicle differs widely among the states.

Variations in motor vehicle license as between the several states are shown in Table I. A five-passenger car weighing 3,000 lb., 24-hp., costing $1,075 new is designated for this purpose. The annual license fee for this type of car varies all the way from $1 in the District of Columbia to $40 in Oregon. In this connection it should be observed that Oregon exempts automobiles from the personal property tax, whereas the District of Columbia does not. There are other states that regard the motor vehicle license fee as being in lieu of all other state and local taxes. In most of the states, however, motor vehicles are subject to local assessments and contribute their share toward the general property tax collections. The average license fee assessed against this type of a car in all of the states amounts to $14.50.

If it is further assumed that this specified car consumes annually 400 gal. of gasoline, the gasoline tax as it is collected in the country as a whole brings the range of the total license fee and gasoline tax charged against the car from $8 in Illinois to $52 in Oregon; the average amounts to $24.42. The gasoline tax averages $9.92 in spite of the fact that four of the states had no gasoline tax in effect in 1926. The gasoline tax in those states that collect this type of a tax varies for a consumption of 400 gal. from $4 to $20. The motor vehicle revenues (license fee and gasoline tax) tend to be higher on the average in the less developed and less densely populated states. According to this analysis there are fifteen states where it would cost less than $20 to operate this specified type of a car inclusive of license fees and gasoline taxes, and these fifteen states contain approximately half of the registered cars of the country.

The variations in motor bus license fees in the several states are just as great as they are in the case of passenger cars. That statement may also be true for motor trucks, but since the study made at this time does not include that type of a vehicle no definite statement can be made. In order to make a proper comparison of motor bus license fees and gasoline tax collections computations have also been made and are shown in Table II, which gives by states the license fees and gasoline tax charges of common type of bus. For these purposes the following specifications were set up: 20-passenger capacity, pneumatic tires, $8,000 cost, 9,000-lb. weight, 30 hp., 50,000 miles annual operation, $12,000 gross receipts, 7,142 gal. gasoline consumption. By applying the 1926 license fee schedules of each of the states to such a type of bus engaged in common carrier service over a regular route and between fixed termini it is found that the fees vary from $10.50 in Missouri to as much as $1,428.57 in Maryland. The higher level of license fees charged in a considerable number of states for motor bus operations is largely due to a recently adopted policy which seeks to make the license fee de-

TABLE II—LICENSE FEE AND GASOLINE TAX PAYMENTS FOR MOTOR BUS, 20-PASSENGER, PNEUMATIC TIRES, 9,000 LB., PRICE $8,000, 30 HP., 50,000 MILES ANNUALLY, $12,000 GROSS RECEIPTS, 7,142 GAL. GASOLINE CONSUMED, OPERATED OVER REGULAR ROUTE—1926

State	License Fee Amount	License Fee Per Cent of Total	Gasoline Tax Amount	Gasoline Tax Per Cent of Total	Total
Maryland	$1,428.57	91	$142.84	9	$1,571.41
Oregon	847.00	80	214.26	20	1,061.26
Iowa	866.00	86	142.84	14	1,008.84
North Carolina	720.00	72	285.68	28	1,005.68
Utah	750.00	75	251.97	25	1,001.97
Minnesota	800.00	85	142.84	15	942.84
West Virginia	666.66	73	251.97	27	918.63
Idaho	600.00	74	214.26	26	814.26
Florida	435.00	60	285.68	40	720.68
Arizona	500.00	70	214.26	30	714.26
Nevada	480.00	63	285.68	37	765.68
Kentucky	315.00	47	357.10	53	672.10
California	510.00	78	142.84	22	652.84
Virginia	291.66	47	321.29	53	613.05
South Dakota	360.00	63	214.26	37	574.26
Connecticut	421.32	75	142.84	25	564.16
South Carolina	200.00	36	357.10	64	557.10
North Dakota	326.00	70	142.84	30	468.84
Mississippi	119.00	29	285.68	71	404.68
Arkansas	117.00	29	258.68	71	402.68
Wisconsin	243.75	63	142.84	37	386.59
Oklahoma	225.00	61	142.84	39	367.84
Kansas	223.00	61	142.84	39	365.84
Michigan	202.50	59	142.84	41	345.34
Indiana	120.00	36	214.26	64	334.26
Georgia	75.00	23	251.97	77	326.97
Ohio	$180.00	56	$142.84	44	$322.84
Nebraska	165.00	54	142.84	46	307.84
New Mexico	85.00	28	214.26	72	299.26
Tennessee	70.00	25	214.26	75	284.26
Maine	60.00	22	214.26	78	274.26
Washington	130.00	48	142.84	52	272.84
Vermont	120.00	46	142.84	54	262.84
Montana	25.00	10	214.26	90	239.26
Louisiana	96.40	40	142.84	60	239.24
Texas	152.75	68	71.42	32	224.17
Colorado	71.00	33	142.84	67	213.84
Wyoming	25.00	12	178.55	88	203.55
Alabama	60.00	30	142.84	70	202.84
Pennsylvania	50.00	26	142.84	74	192.84
Delaware	46.00	24	142.84	76	188.84
New Hampshire	42.00	23	142.84	77	184.84
District of Columbia	12.00	8	142.84	92	154.84
Missouri	10.50	7	142.84	93	153.34
Rhode Island	75.00	51	71.42	49	146.42
Illinois	127.00	100	.....	..	127.00
Massachusetts	100.00	100	.....	..	100.00
New York	52.00	100	.....	..	52.00
New Jersey	30.00	100	.....	..	30.00
Average	$278.10	63	$175.75	37	$453.85

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pend largely on the amount of business done or the degree of highway use rather than to base it solely on the type or character of vehicles, as is the case of passenger cars. Where a gasoline tax exists there is an additional charge collected which tends to vary in proportion to mileage traveled.

There are now nine states that predicate their motor bus license fees on a mileage basis, either in the form of seat mileage, estimated ton mileage, passenger mileage, or vehicle mileage. It should be noted that all of these states have gasoline taxes in effect besides. Then there are six states in addition which base the amount of license substantially on gross revenues. In following this method mileage must be regarded as a factor, though not definitely expressed. These percentages upon gross receipts which constitute the amount to be paid for a license range all the way from 3 per cent to 6 per cent. All of these fifteen states that use mileage or gross revenues as the license fee basis exact comparatively high fees from motor buses that do an extensive business, as compared with the states which base their license fees upon such constant factors as weight, horsepower or seating capacity.

The gasoline tax amounts to a very considerable sum where extensive operations are involved. Taking into account both the license fees and the gasoline taxes for this type of a bus, as before specified, it is found the average for the different states is $453.85, but in individual states the total charges paid range from $30 in New Jersey to $1,571.41 in Maryland. The total license fees and gasoline taxes per motor bus of the given specifications amount to more than $1,000 in five states; there are twelve states in the $500-$999 group; 22 states in the $200-$499 group; and in ten states the total charges in each case are less than $200.

Ton-Mile Taxes Also Vary

Although there is not time nor space available to make an extensive comparison between the passenger car total charges and the total charges for motor buses for each of the states, it may be said that there are substantial variations when the figures contained in Table I and Table II are reduced to a ton-mile basis. Taking these specific types of cars again as the bases for the computations it is found that the total ton-mile charges (license fees and gasoline taxes) average 2.2 mills for the country as a whole; for the motor bus the average of the several states is 1.5 mills per ton-mile, or about 30 per cent less. That general situation exists in a great many of the states, but there are a few states where the reverse relationship holds true. In Maryland, where the passenger car charges are relatively low and the motor bus charges high, the ton-mile charges for buses is 5.2 mills and for passenger cars 1.4 mills, using again the vehicles with given specifications as the basis for computation. On the other hand, in New Jersey the passenger car charges are 0.8 mill per ton-mile and the motor bus charges but 0.1 mill.

A cursory sketch, as this has been, nevertheless ought to be sufficient to impress one with the fact that there is not only a wide divergence in the methods and bases followed in order to obtain revenues from motor vehicle operators, but that there is also no definite or tangible policy as to the proportionate amount of total highway expenditures which should in fairness and justice be borne by the users of the highways. As I view the situation, one of the main reasons why this condition exists is because there are so few fundamental facts regarding this problem which are available to members of a legislature who have such matters in charge.

It is only in the last few years that state authorities have realized the economic importance of conducting highway traffic surveys so that they may learn the character and the extent of highway use. The results of such surveys as conducted by the U. S. Bureau of Public Roads in co-operation with state highway departments furnish a basis for the formulation of highway finance policies as well as for construction and maintenance programs that will bring about a more equitable and fairer distribution of highway costs and expenses among the various classes composing the public.

Railroads for Long-Haul Service, Buses for Short Hauls*

By F. S. Scarr
Formerly Supervisor of Motor Transportation Pennsylvania Railroad

ANY tool of transportation which is economically justified is destined to fulfill its proper function, our selfish interest or narrow vision notwithstanding. We have always been prone, however, to forget the lessons of the past, and have in every instance neglected for a time the opportunities offered by advanced methods and devices. The brief history of the motor vehicle, and particularly its application to commercial needs, seems to indicate that we have again been obstructing the path of economic progress. Fortunately our unwise opposition appears to be near an end. Evidence on every hand points definitely to a better understanding between the old transportation order and the new.

The physical characteristics of the motor coach and the steam train naturally influence their economic relation. The motor coach is designed to handle small groups; it is highly flexible as to time of movement and route of travel, is not dependent upon rigid schedules, and approaches the convenience of individual service. The steam train is designed to handle large groups of passengers, it generally operates at higher speeds, and is confined in fixed schedules and routes.

The cost of motor coach operation is considerably less than that of the steam train; the relation being approximately 30 cents per mile (total cost) for the former and $1.10 or more per mile (out of pocket) for the steam train. If, for example, there were 300 passengers to be moved at one time from Philadelphia to Atlantic City, the steam train would be more economical, as it would cost approximately $1.10 per mile as compared to $3 per mile for ten motor coaches. However, if but 30 passengers were to be moved, the economic choice would be reversed, the steam train costing $1.10 per mile against but 30 cents for the motor coach.

Combining the physical and economic factors, we find the lower unit mile motor coach cost permitting a three or fourfold increase in schedule frequency at the same total cost, bringing the highway vehicle to a point of convenience more nearly in accord with the private automobile. The relation which these two vehicles bear to each other seems to narrow down to the following:

1. The more economical vehicle is determined by the volume and flow of traffic. (Approximately 100 passengers per trip being the dividing point.)
2. The convenience factor, generally speaking, for reasonable distances, completely favors the motor coach. (Distance, as it affects convenience, necessarily varies in every instance, depending upon traffic, road and other conditions that influence the rate of travel as compared with the same movement by rail. Distance is limited only by the willingness of the passenger to travel at what is usually the slower pace of the motor coach).

Division of traffic between the railway and highway is already in the process of adjustment. A review of the passenger traffic handled by the railroads of the United States during recent years indicates a rapid and steady increase from 1900 to 1910. The rapid increase ended abruptly at this period, and except for one brief decline continued to advance, but slowly, to a peak in 1920. From the 1920 peak to 1925 a sharp decline in total passengers carried has been experienced by the railroads, rather than the increase which was to be expected from increases in population and industrial development.

Accompanying the decline since 1920, however, the average journey per passenger has steadily lengthened; this, with other available facts, indicating that the long-haul traffic enjoyed by the railroads is increasing. The commutation

*Abstract of address presented at the annual convention of the Motor Bus Division, American Automobile Association, Philadelphia, June 15-17.

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traffic has also increased steadily since 1920.

It is quite evident, therefore, that the only remaining class of traffic, i.e., the "short-haul single-ticket" or small group business, has declined sufficiently to account for the increase in long-haul and commutation traffic as well as the sharp decline in the total passengers handled.

The private automobile, which because of its convenience and flexibility has absorbed most of the traffic lost by the railroads, as generally indicated above, has also tremendously increased the riding habits of the people and thereby created a new and larger traffic peculiar to itself. The motor coach, advancing into the field of organized highway transportation, has drawn its traffic largely from the private automobile, and as traffic congestion and parking regulations become more severe and a more general knowledge is attained by the private automobile owner of the cost of supplying himself with this convenience, the motor coach will draw its patronage more and more from the private automobile rider.

A significant and important factor that must be considered in any forecast of the probable future relation of the steam train and motor coach transportation is the difference in route mileage used and potential. There are about 250,000 railroad route-miles in the country and except for minor extensions and many probable abandonments, rail transportation will be confined to these routes. The hard-surfaced highways have increased very rapidly during recent years; from 200,000 in 1910 to 557,000 in 1926. This growth will continue. There are in addition some 2,500,000 miles of unimproved roads. Considerably less than one-half of the hard-surfaced roads and probably not more than 5 per cent of the total road mileage is utilized by motor coach lines.

Motor Coaches Increase Volume of Passenger Traffic

It is not to be expected that the proportion of total route-miles indicates the potential relations of these two modes of travel, for the steam roads have by their pioneering efforts established routes of travel that must, generally speaking, endure for all time. However, as the railroad has tended to centralize or concentrate, by virtue of its fixed routes, so will the motor coach, with its tremendous potential route mileage, tend to disperse, and in so doing create for itself a constantly increasing volume of traffic, a sound business development and a permanent and prominent place in transportation.

The motor coach, in its own economic right, has a definite, a large and a sound development ahead. As a sound phase of transportation, it must bear certain definite relations to other modes and particularly to the steam railroads. These relations are not difficult to foretell, in the light of available facts and the steps being taken by transportation interests generally to bring about a better co-ordination of transportation facilities.

The tremendous loss of passenger traffic recently experienced by the railroads, amounting to more than $250,000,000 annually—compared to 1920—has affected almost exclusively the local passenger train revenues. A careful survey of this phase of railway transportation indicates that a large percentage of local steam passenger trains are not earning sufficient passenger revenues to pay the "out of pocket" costs. These trains are, therefore, generally averaging a smaller number of passengers than can be accommodated in a single 50-passenger motor coach. The through passenger business has been little affected, except in rare instances. Pending the development of commercial aviation, the steam train will probably continue to meet the long-haul requirements.

The foregoing, coupled with the obvious characteristics of the steam train and motor coach, leave little doubt about the future apportionment of available traffic. Of the mass of "large group" movement, the steam train will handle the long-haul portion for many years to come, and such of the short-haul portion as may not be handled by terminal rapid transit systems. Air transport will affect but little this class of traffic, at least for many years. Of the individual, or "small group" movement, the steam train will gradually give up much that still remains of the short-haul portion to highway transportation. The highways will also assume some small portion of the "longer haul." Aid transport will ultimately take the principal rôle in handling the long-haul, small-group traffic.

Regardless, however, of the manner that each local problem is solved, certain fundamentals must prevail. (1) Each mode of transportation must be used where economically suited. (2) Sound business organization and management must be maintained. (3) Complete co-ordination with other modes and other lines must be insured through co-operation or consolidation.

Wisconsin Accountants Hold Two-Day Meeting

PROCEDURE in accounting to be followed by the electric railway companies having large numbers and various kinds of transportation equipment constituted one of the principal topics at the two-day convention of the accounting section of the Wisconsin Utilities Association at Green Bay, June 17 and 18, which was attended by eighty utility company representatives.

M. Zass, assistant superintendent of rolling stock Milwaukee Electric Railway & Light Company, championed the idea that companies should use an accounting system that will group the various kinds of like equipment and then distribute costs on an hourly or daily basis. An abstract of his paper will appear in a future issue of the JOURNAL.

L. E. Gettle, chairman of the Wisconsin Railroad Commission, vigorously assailed the reproduction cost principle laid down by recent U. S. Supreme Court decisions, laying particular stress upon the alleged impossibility of reconciling the treatment of overhead expenses and going value under that doctrine.

He said that the Wisconsin Supreme Court, as well as other state Supreme Courts, has gone way beyond the intention expressed by the U. S. Supreme Court in applying the reproduction cost principle. He declared that the U. S. Supreme Court decision does not mean that controlling weight must be given to current prices. He applauded the recent decision of the Massachusetts Department of Public Utilities attacking the Supreme Court's attitude and said he believed that it represented the general opinion of practically all state regulatory commissions.

The value of a utility property as a going concern is the only value which that property can have for purposes of rate making, he said. The theory that the value must always be in excess of the cost or of the estimated cost of production of the physical property is utterly ridiculous. The utility which has not earned a profit and has no prospects of earning a profit is not worth the cost of its physical property, regardless of the theory of jurists or engineers or economists.

S. R. Hatch, Milwaukee Electric Railway & Light Company, in describing the accounting treatment of property retired, said that it closely parallels the accounting procedure, accorded additions to and betterments of its property. Difficulties encountered with this treatment in connection with property acquired through contract are being overcome by a property and plant record system now in process of development. It will consist of a property ledger, or series of ledgers, subsidiary to and controlled by the property and plant account in the general ledger, together with an underlying system of work order analysis.

C. B. Boulet, safety director Wisconsin Public Service Company, urged accountants to participate actively in the organized safety work of their companies. He said that through their contacts with the pay envelope they could encourage accident prevention thinking among all employees. He said that even accountants are not immune to accidents, citing the case of one large company which last year reported that five girls lost either parts of or entire fingers in addressograph work.

D. W. Faber, Wisconsin Public Service Corporation, was elected chairman of the accounting section and Louis P. Smith, Milwaukee Gas Light Company, was elected vice-chairman.

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American Association News

Exhibits Will Exceed Any Previous Display

WITH 28 members present the exhibit committee of the American Electric Railway Association held an enthusiastic and constructive meeting in the offices of its chairman, Col. J. H. Alexander, in Cleveland on Wednesday, June 22.

As the first order of business Fred C. J. Dell, director of exhibits, made his report, the high lights of which are as follows:

When the convention opened last year it had actually assigned 119,007 sq.ft., of which 38,316 sq.ft. or 39⅓ per cent, was occupied by 31 bus, truck and body manufacturers. Out of a total of 107,543 sq.ft. applied for this year, 34,922 sq.ft., or approximately 33⅓ per cent, has been asked for by 29 bus, truck and body manufacturers. The director's report then outlined recommendations of the special manufacturers' committee appointed by President Sawyer, a meeting of which was held on May 19. These recommendations made to the executive committee, and afterward referred to Colonel Alexander, embody: (1) Opening of the exhibits on Saturday noon preceding the first session of the association. (2) That if the public is permitted to view the exhibit—not recommended by the committee—the date be fixed for Oct. 2, and the time from 3 p.m. to 10 p.m., and that the number of tickets issued to the public be controlled and limited in some manner to be arranged by the Cleveland convention committee. It was also recommended that if the baseball World Series is in progress, the scores should not be shown in the same conspicuous manner as was the practice last year. Additional recommendations covered the continuance of the organ recitals at approximately the same hours as last year, and the appointment of a special subcommittee to promote a large attendance of railroad operating men on Saturday and Sunday, Oct. 1 and 2. In making this last suggestion it was the special committee's thought that all street railway companies in the Middle West can promote week-end excursions to be attended by employees who would benefit by visiting the exhibit.

Mr. Bell, who acted in the capacity of secretary at the meeting, then read as a section of his report minutes of the meeting of the special sub-committee which was appointed to make tentative space layouts. Up to the close of business on June 15 the director had received 216 applications requesting approximately 104,143 sq.ft. of exhibition space; at the same period last year he had received 193 applications requesting approximately 95,001 sq.ft. Since June 15, Mr. Dell had received nine applications, bringing the total to date up to 225, requesting approximately 107,586 sq.ft.; the same date in 1926 he had a total of 193 applications requesting approximately 102,859 sq.ft. Other matters touched upon consisted in drawing the sub-committee's attention to the matter of location of noisy operating maintenance of way exhibits, and a résumé of the work done in securing the co-operation among automotive tool and parts people which had been accomplished this year through the co-operation of L. F. Stoll of the McGraw-Hill Publishing Company, Inc., some 200 representative companies having been solicited.

Following this report there was general discussion in the sub-committee regarding the placing of exhibits of a noise-producing character. Upon motion of Mr. Hauer, seconded by Mr. Hegeman, it was decided that all noise-producing exhibits should be located in the Esplanade, Section E, with the understanding that all exhibitors allotted space in this section should be free to operate their exhibits at all time. This motion was carried.

Among other questions broached at the meeting was the matter of authorizing the executive secretary and director of exhibits to cancel the space applications of any company which might not make payment for the exhibition space occupied or other outstanding obligations of the association within a reasonable period. This motion was carried. The work of the executive secretary, the chairman and director of exhibits, in connection with all details which had been accomplished previous to this meeting, was approved. Upon motion of Mr. Jenks the question of placing automotive service equipment such as snow sweepers, etc., in with track exhibits was discussed, the committee indorsing such a course. Next was discussed the showing of special automotive vehicles and bus equipment for testing brakeshoes, etc., in with track exhibits. It was so ordered.

The committee then took up the question of space assignment to all members who had applied, all of whom were awarded locations. In this connection it was pointed out that naturally there will be some disappointment occasioned by the locations as awarded. However, it was the committee's thought that this was to be expected when consideration is given to the fact that there were in some instances as many as a dozen applicants for the same space.

Further exhibit details the committee decided would be left to the chairman and the director of exhibits with power to act. The chairman announced that the next meeting of the committee would take place at the office of the director of exhibits, Cleveland Public Auditorium, at 10 a.m. Eastern standard time, Saturday, Oct. 1, 1927.

Committees appointed by Chairman Alexander at this meeting were as follows:

Decorations—J. C. McQuiston, chairman; B. A. Hegeman, Jr., L. W. Shugg and Fred C. J. Dell.

Space Duties—To visit each exhibitor, ascertain whether his space is satisfactory and to report to director of exhibits if there are any complaints.

C. E. Morgan and T. W. Casey—To visit with exhibitors in Section A, Arena Floor.

J. S. Pevear and S. P. McGough.—To visit with exhibitors in Section B, Exhibition Hall.

C. P. Billings and Roy A. Hauer.—To visit with exhibitors in Section C, Auditorium's West Wing.

B. C. Edgar and G. L. Kippenberger.—To visit with exhibitors in Section D, Open Air Track Space.

Harry Reid and C. S. Hawley.—To visit with exhibitors in Section E, Esplanade. Open air covered Maintenance of Way Space.

Power Duties: L. D. Bale, chairman; J. F. Egolf, R. N. Graham and A. L. Price.

Car and Bus Exhibits: C. H. Clark, chairman; H. Fort Flowers, A. P. Jenks, A. L. Kasemeier, G. L. Kippenberger, and A. M. Robinson.

Sub-Committee to Co-operate with Entertainment Committee: Stanley P. Seward, chairman; Herman Bender, Charles Gordon, and Fred B. Bullock.

Sub-Committee on Space Assignment for Track Exhibits: J. H. Alexander, chairman; C. H. Clark and Fred C. J. Dell.

In addition to these groups, the special manufacturers' committee consisted of Thomas Casey, chairman; M. B. Lambert, Charles R. Ellicott and J. R. Fitzpatrick, and the sub-committee of the exhibit committee of B. A. Hegeman, Jr., C. S. Hawley, R. A. Hauer, S. P. McGough, J. C. McQuiston and L. W. Shugg.

Those present at the general committee's meeting in Cleveland were: J. H. Alexander, chairman; J. R. Ammon representing E. C. Faber, L. D. Bale, Herman Bender, Fred B. Bullock, O. A. Broten and A. Frank Paul representing T. W. Casey, R. M. Campbell, C. H. Clark, H. Fort Flowers, R. A. Hauer, C. S. Hawley, B. A. Hegeman, Jr., A. P. Jenks, H. J. Kenfield, G. L. Kippenberger, S. P. McGough, J. C. McQuiston, A. L. Price, A. M. Robinson, S. P. Seward, L. F. Stoll representing Charles Gordon, L. W. Shugg, J. B. Wright representing S. G. Down, J. W. Welsh, executive secretary; Frank Campbell, secretary Cleveland convention committee; F. C. J. Dell, director of exhibits, and John Vignec, assistant to director of exhibits.

Power Transmission and Distribution

CONSIDERATION of sub-committee recommendations and discussion of subjects for next year occupied the time of the committee on power transmission and distribution at its final meeting held at association headquarters in New York, on June 17. The following were present: F. McVittie,

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chairman; J. Walter Allen, W. H. Bassett, M. W. Cooke, J. H. Drew, J. C. Damon, C. L. Hancock, S. S. Hertz, K. J. Keith, A. J. Klatte, J. Leisenring, H. S. Murphy, J. F. Neild, W. J. Quinn, M. B. Rosevear, W. Schaake, A. Schlesinger, R. D. Wade, H. C. Casey representing G. F. Wennagel, and C. H. Jones, sponsor.

At the beginning of the meeting the committee discussed the new subjects which would be recommended for consideration of the subjects committee. In addition to the suggestions offered at the last meeting, topics recorded were: Clearance diagrams for equipment, car loading, etc.; severest load conditions for overhead wires and supporting structures; safety factors used in the design of overhead supporting structures and wires; insulation for overhead contact systems; the use of ferrous and non-ferrous materials for overhead construction; specifications for installation of feeder cables for city work; the limitations of reduced trolley voltage in congested areas. The committee will ask that special attention be given to a study of the life of trolley ears, the use of trolley armor, ears for grooved wire and the use of steel cross-arms for steel poles and cross-arm supports for wooden poles.

The sub-committee on the review of existing standards recommended certain changes in distribution specifications and proposed that the specifications for electric conduit construction be referred to next year's committee for review. It also was recommended that a special committee study the question of lightning protection of both car and line equipment.

Sub-committee No. 2 on specifications for catenary material will present a progress report this year, and next year's committee will continue the work of revising Manual sections D102-21 and D104-25.

The sub-committee on trolley wire wear will bring the work of the last two years up to date in this year's report. A design of a measuring device for trolley wire was exhibited and will be used to make up an instrument for trial purposes.

Indications from the report of sub-committee No. 4 on specifications of high-strength trolley wire point to a compromise with the A.S.T.M. Final action by both associations is needed to bring both specifications into agreement.

Reports on radio interference and inductive co-ordination showed that very little had occurred in these fields worth recording. Inasmuch as the work of these two committees overlap in certain phases the main committee voted that both subjects be assigned to one special committee next year.

The report of the sub-committee on feeder ties between automatic substations recommended that the subject be discontinued on account of the great effect which local conditions have on the subject. The main committee did not agree with the recommendation of the sub-committee and will request that a special committee be formed to consider the subject jointly with representatives of the power generation group.

The sub-committee assigned to the subject of comparison of operating methods reported progress and recommended continuance of the subject. The sub-committee investigating the possible reduction of the number of sizes of trolley wire reels reported that in its opinion three or four sizes would be adequate.

Power Generation and Conversion

VENTILATION of automatic substations and protection of mercury-arc rectifiers were the principal subjects discussed at the meeting of the committee on power generation and conversion of the Engineering Association held at association headquarters in New York, on June 9 and 10.

At the first morning session an informal discussion of the ventilation of automatic substations took place, but no definite conclusions were reached. In the afternoon the discussion of ventilation was temporarily resumed, after which the report of the sub-committee on rectifiers was presented by Mr. Doub. In the discussion which followed a number of changes were suggested in the sections on "Ratings" and "Automatic Operation," but on account of the absence of certain members interested in that topic further discussion was deferred until the next day. In the discussion on rectifiers, which continued the next morning, it was brought out that on account of the nature of the information and the lack of explanation and justification for the figures given it would be advisable to omit certain parts of the report and to treat the section on "Comments Received" in a general way.

The committee will recommend that a study be made next year of the advisability of separating the current-carrying parts on the switchboard from the control apparatus.

On the subject of ventilation of automatic substations the proper radiation factor for figuring heat dissipation by absorption occupied a great deal of the committee's attention. The results of several tests on substations showed that the actual calculated factor for figuring radiation was considerably higher than that given in Kent's handbook. The discussion showed that the value of this factor was affected by load and atmospheric conditions and that this factor became ineffective when constant heat conditions obtained. A number of suggestions were made for properly taking account of the effect of radiation, but it was finally decided to use a figure which would vary inversely with the load factor.

Plans were outlined to include in the report on automatic substation ventilation the tabulated results of tests made on several stations, plans and descriptions of other substations, a computation on the efficiency of air flow due to difference in temperature and a repetition of some of the more important cuts and diagrams which were published in last year's report. The report will also refer to those special conditions which make forced ventilation advisable.

A brief exposition of the subject of the most economical trolley voltage in congested districts will appear in this year's report, together with a recommendation that a definite study of this topic be made next year.

Those present included C. A. Butcher, Mr. Doub representing G. I. Wright, H. W. Codding, H. W. McRobbie, P. Blommers, H. A. Kidder, R. L. Weber, Otto Naef, R. G. Winans, F. W. Peters, G. H. Sohlberg, W. E. Bryan, chairman; L. D. Bale, sponsor, and G. C. Hecker of association headquarters.

Heavy Electric Traction

MATERIAL for the forthcoming annual report was considered at the third and final meeting of the committee on heavy electric traction of the Engineering Association, held at association headquarters, New York City, on June 17, 1927. Those present were H. F. Brown, chairman, A. H. Armstrong, Morris Buck, H. W. Cope, E. P. Chase representing J. V. B. Duer, H. H. Febrey, J. T. Hamilton, G. L. King representing J. H. Davis, M. W. Manz, L. S. Wells and G. C. Hecker.

Mr. Wells reported that there was no change to make in the Manual sections. In the discussion it was pointed out that the American Electric Railway Association now has a specification for light catenary construction, but which is unsuitable for heavy service. The American Railway Association has in preparation a specification for catenary construction for heavy traction. It was suggested that this committee wait until the American Railway Association specification is released next September, before further action.

Mr. Manz presented the report of the sub-committee on bonds, which follows up the work done last year on the same subject.

Mr. Hecker reported that the New York Public Library has accepted the bibliography and that publication has been authorized. While no date has been set, it is hoped to publish it in the library's bulletin early in 1928. Publication will continue serially until the entire bibliography is completed. It was recommended that the subject be dropped for next year.

Mr. Armstrong reported that on the subject of self-propelled cars his sub-committee has tabulated data from sixteen roads operating 191 motor cars and 92 trailers. It was agreed that the data would be prepared without identification of any of the roads.

Mr. Daus' report on train operation, with particular reference to articulated trains, was accepted and will be published in the annual report.

Mr. Cope presented a revision of the tabulation on electric locomotives. He also will furnish a revision of the chart showing mileage of electrified steam roads and the number of locomotives.

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News *of the* Industry

Purchase Committee Dismissed in Los Angeles

A report of the special committee formed recently to interview Henry E. Huntington or his representatives regarding the purchase of the Los Angeles Railway, Los Angeles, Cal., by the city has been made to the City Council.

The committee declared that due to the death of Mr. Huntington, his estate has gone into probate court and that the present trustees do not feel authorized to deal in this matter.

The committee, composed of Mayor Cryer, City Attorney J. E. Stephens and Councilmen Shaw and Sanborn, then asked to be discharged and was voted out by the Council.

Following the suggestion of Dr. Delos F. Wilcox, acting in an advisory capacity for the city of Los Angeles, Cal., the City Council on May 14 named a special committee to negotiate with Henry E. Huntington, the owner of the railway system, or his representative, as to the best price and the most favorable conditions for the acquisition without the necessity of issuing bonds against the general credit of the city. This committee was authorized to ascertain terms upon which the city can procure a standing option to buy the railway lines.

Some Chicago Bills Lost

A group of five Chicago transportation bills died in the Illinois General Assembly on June 30, being among 30 Senate bills which were stricken in the lower branch on second reading because there did not remain another legistive day on which they could be placed on final reading for passage. The five bills were introduced by Senator Richard J. Barr, Joliet. The Durso bill, which provided for a board of transportation for Chicago, and the McCluggage bill, which provided for a municipal public utilities commission, giving such commission the authority now vested in the Illinois Commerce Commission, both died in the Senate public utilities committee after having passed the House. An effort to bring them out of committee was unsuccessful because there did not remain the necessary three legislative days for their consideration.

Overtime Rates Slightly Higher in Toledo

Settlement of the wage issues, in question at Toledo, Ohio, for several weeks, was made possible when the employees of the Community Traction Company voted by a close margin to accept the final offer of the company.

The new agreement is substantially the same as the old, but provides slightly higher overtime rates and some other concessions in working conditions. The basic wage scale therefore will be 50 cents an hour for the first nine months, 52 cents an hour for the next three months and 55 cents an hour thereafter, with a bonus of 5 cents an hour for one-man car or bus operators. Under the new contract the company will increase the overtime rate from 75 to 82½ cents for two-man operation and from 80 to 90 cents on one-man cars and buses. Clauses which favor the men on meal relief, layover time and reporting time remain as in the 1926 contract. The company also agrees to a nine-hour day on all regular runs.

The men had asked for a flat increase of 10 cents an hour in wages on the basis that they have had no increase for four years. The company refused to consider arbitration on the ground that it had no desire to disturb general wage scales throughout the property and possibly by a downward revision.

The old contract expired on May 31. New provisions will be retroactive to that date.

Fares in Local Zones Raised in Boston

The Boston Elevated Railway, Boston, Mass., announces a change in fares, effective July 1. It has been selling five tickets for 30 cents, for use in local zones, and this rate is changed to four tickets for 25 cents, netting an increase of ¼ cent per ticket to the elevated.

At the same time the elevated management creates a straight 5-cent fare for children under fourteen years of age, to be effective until Labor Day. Wherever adults ride for 10 cents over the elevated system, surface cars, subways and elevated structure, children may ride for 5 cents. This is to stimulate outdoor life for children during the summer.

Eight Cents in St. Louis

Temporary New Rate in Effect for Six Months—Valuation Tentatively Set at $52,024,192—Delay Sought by City Refused—Franchise Being Negotiated

THE Missouri Public Service Commission on June 25 granted the United Railways, St. Louis, Mo., an 8-cent fare with the provision for the sale of two tokens for 15 cents. The new schedule will be in effect for six months from July 5 and thereafter until modified or terminated by the commission. It will be actually in effect until the completion of the present pending rate and valuation cases. These will require at least six months for final disposition.

The commission also fixed the tentative valuation of the company's property for rate-making purposes at $52,024,192 as of Dec. 31, 1926. It arrived at this amount by taking as a basis the valuation of $51,781,348 as of Jan. 1, 1919, fixed four years ago. To that amount was added $6,425,943 for betterments and additions since Jan. 1, 1919, or a total of $58,207,291, but $6,183,099 was deducted for depreciation.

An audit of the company's books had revealed that in the period mentioned the company had set aside from earnings for depreciation reserve $12,300,357, but had actually charged off only $6,117,258 for depreciation. The commission held that the difference between the depreciation reserve and the depreciation charge off or $183,099 should be deducted from the $58,207,291 total valuation on the theory that the company could not retain this as working capital.

The commission's auditors found that in 1926 the company had actually available for return on investment only $2,447,864 or 4.7 per cent on the tentative valuation. It is estimated that under the new schedule the amount available for return should be $3,686,700, or 7.1 per cent. The commission also ruled against the city's contention that the city and county lines should be divided.

The commission has left the way open for a higher valuation than $52,000,000 in its final decision. The city has not submitted any evidence in rebuttal to the claims of the company for the valuation of approximately $100,000,000.

City Counselor Muench had asked for a postponement of six months in further hearings on the company's application to enable the city to prepare properly its case in opposition to the higher fare, but also against the contentions of company officials for a valuation of approximately $100,000,000.

The reorganization committee in negotiations with city officials on a new franchise has agreed to accept a valuation of $60,000,000 under a 30-year service-at-cost franchise.

The evidence on earnings in 1926 showed company was entitled to relief on the basis of the 1919 valuation brought up to date, and this need was so pressing that an actual emergency existed, so the commission could not morally await the taking of the city's evidence against the reproduction new theory. The commission estimated that on the basis of the total passengers carried in 1926 the new fare would give the company additional revenue of $1,466,846 and would provide a return of 7.1 per cent on the tentative valu-

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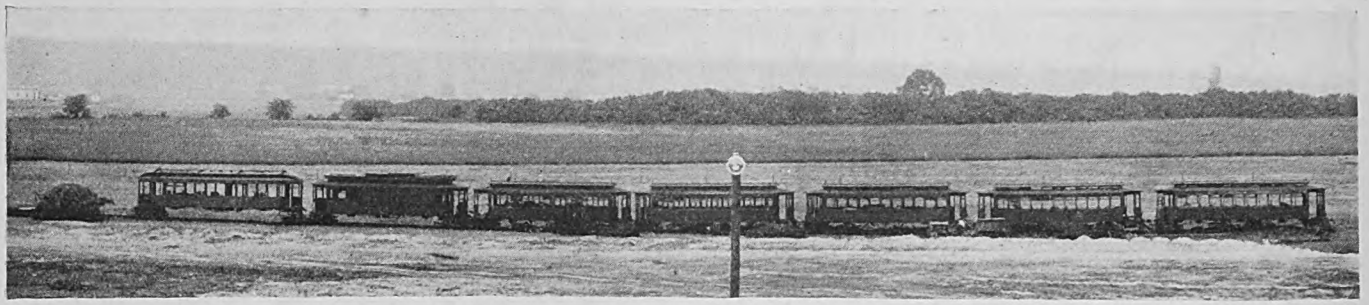
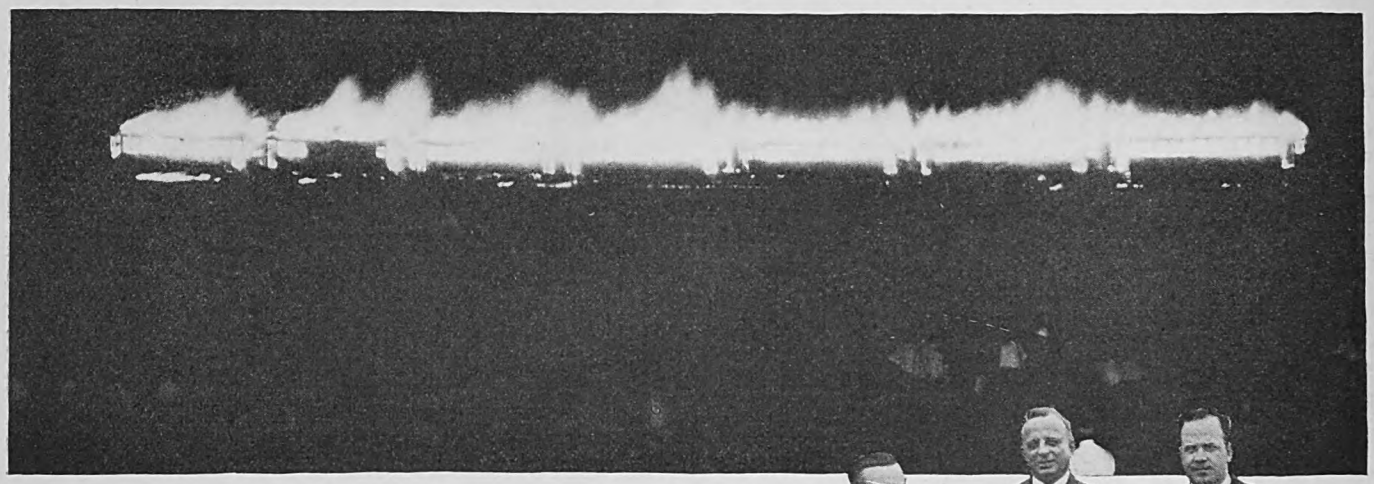
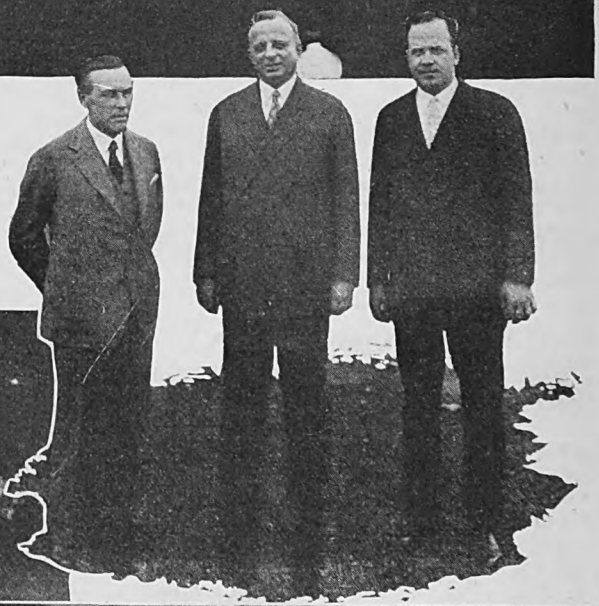




20,000 People Looked On

PICTORIAL representation of events attending the Cincinnati, Hamilton & Dayton Railway rehabilitation celebration, together with group of officers. Reading from left to right: J. H. McClure, vice-president and manager; Dr. Thomas Conway, Jr., president, and W. L. Butler, vice-president.



INCLUDED among the events at the C., H. & D. celebration on June 22 were a dinner in the company's new shops and office building and the destruction of the old rolling stock that evening while about 20,000 people looked on. The illustrations, other than the one showing the group of officers, to which reference has already been made, show the cars lined up for burning, their destruction, part of the crowd assembled to witness the event, and the diners in the company's new shops.

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ation fixed. The increased fare was ordered, the commission stated because it was justified by the evidence presented and because of the delay sought by the city to prepare its case in opposition to the application.

Ten Cents on Syracuse Interurban

The Public Service Commission on June 29 authorized the Syracuse & Eastern Railroad to file a new schedule of fares on its lines from Syracuse, N. Y., through Fayetteville to Manlius and fixing the cash fare at 10 cents or 7½ cents ticket fare, tickets to be sold six for 45 cents on cars and four for 30 cents if purchased at the station. The company is also authorized to establish a new fare zone to be known as new city line to Stop 7-C zone, and within this new zone the company will add to its fare for passengers destined to points within the zone from points without the zone, or in the other direction, 4 cents for each cash fare, 5 cents for each ticket fare and 25 cents commutation ticket. This change will not affect passengers passing through the zone. The new regulations will be effective July 15, 1927.

At the same time, the complaint of Mayor Hanna against the railroad was dismissed. This complaint was filed on the ground that the railroad was charging two fares for passengers within the city limits. The city limits had been extended in 1926 to include what is known as Genesee Manor. The railroad then petitioned the commission for authority to establish two fare zones within the new city limits. Subsequently the railroad amended its petition to establish one fare zone within the city, the fare to be the same as on the New York State Railways. This amendment to its petition removed the cause of complaint by the Mayor. The present fare is 14 cents cash, or 12 cents ticket. The new fare under the petition within the city limits would be 10 cents cash and 7½ cents ticket.

Commissioner Brewster filed a memorandum in connection with the order in this case, which said that the change in rate would not increase revenues of the company, nor would it increase the fare paid by most of the riders because most of the traffic originated outside the city or beyond the present first 7-cent zone.

One-Man Cars Added

Eighteen more one-man cars were in operation on June 1 on the lines of the New Haven division of the Connecticut Company, New Haven, Conn. This is in accordance with an announcement made by the company a month ago to the effect that one-man cars would be put on several lines, replacing two-man cars in the interest of economical operation. It is expected that in the fall the company will make additions to one-man-operated car service on other lines in the city where two men are now employed.

Increase Proposed on Philadelphia Suburban

The Philadelphia & West Chester Traction Company, which operates from 69th Street Terminal, Philadelphia, to Sharon Hill, Media, Ardmore and West Chester, has announced an increase in the passenger rate to a flat 10-cent fare effective July 20.

The company serves one of the most actively growing sections in the state. Its action eliminates the use of the 7½-cent ticket formerly sold in strips of four each for 30 cents and establishes the flat 10-cent rate for all zones where the ticket was used. Where formerly the cash fare was 8 cents it will now be 10 cents. An increase in fare from 69th Street Terminal to Seventh and Welsh Streets, Chester, from 19 to 22 cents is also announced.

School tickets, which, under the present rate, cost 7½ cents, will, under the new tariff, cost 10 cents each. An increase in the special car rates from $8 to $10 per car-hour is also announced. Special car rates for service between 1:30 a.m. and 4:30 a.m. are also increased, and there is an increase in minimum charge for special cars from $16 to $20.

Among the changes provided for in the tariff, which include the elimination of all tickets except the joint ticket from 69th Street Terminal to Chester and of school tickets, is also announced a change in the fare zones along the route to West Chester. Where formerly there were six fare zones to West Chester, making the total fare for a one way trip 45 cents, there will, under the new rate, be five zones at 10 cents per zone, making the total one way fare 50 cents. The through rate from Media to 69th Street is 15 cents for two zones, but the charge in each zone for intra-zone traffic will be 10 cents.

In a letter issued to patrons of the lines by A. Merritt Taylor, president of the company, the reasons for the step are explained. During the twelve months ended Dec. 21, 1926, the letter states, the income statement shows that the company earned $17,767 applicable to return on $798,000, actual cash investment in the Philadelphia & West Chester Traction Company's stock.

Reasons for the increase in fares are found in a paragraph which reads:

We had hoped that the rapid increase in traffic (due to the rapid growth of the communities served) would produce a large increase of earning with the present rate of fare, but this hope is not being realized, due largely to diversion of traffic by privately owned automobiles, motor buses and taxicabs on improved highways.

Since March 1, 1913, at which date practically all the company's lines were constructed, the unit fare has been increased from 5 to 8 cents, with four tickets for 30 cents. Average unit fare per passenger is now 7.55 cents, which represents an increase of only 51 per cent over the unit fare charged on March 1, 1913.

The letter to the patrons asks for their support and points out that in the year ended 1913, passenger revenue per car-mile was 29.84 cents, while this revenue in the year ended March 1, 1927, was 54.67 cents per car-mile, an increase of only 83 per cent. In the year ended 1913 the cost of operating one car 1 mile was 16.82 cents. This cost is now, according to the statement, 37.23 cents, or an increase of 121 per cent.

Wages Unchanged by New York State Railways

Negotiations for a new labor and wage contract, covering more than two months, between representatives of the New York State Railways and union officials of Rochester, Syracuse and Utica ended on June 30 with an agreement to continue the present contract.

This action affects 3,000 employees in the three cities, who sought originally a flat increase of 9 cents an hour and changes in working conditions. The present scale calls for 55 cents an hour for operators of two-man cars, 57 cents for interurban employees and 60 cents for one-man car operators.

The men twice in joint balloting in the three cities rejected the proposal to renew the contract. After prolonged bargaining the workers voted to empower their officers to make the settlement.

Railway officials pleaded that increasing cost of maintenance and operation precluded any wage advance. The vast improvement program in the three cities, mostly new paving, was cited as the principal reason for the inability to grant any advance this year.

The wage contract expired on May 1.

Terminable Permit Bill Not Reached in Florida

No action was taken by the Florida Legislature on the terminable permit bill, to which reference has been made before in the ELECTRIC RAILWAY JOURNAL. The Florida session is limited under the constitution to 60 days. At the recent meeting nearly 3,000 bills were introduced in both branches. It was impossible to read all these bills, much less act upon them. The sponsors of the permit bill feel that it would probably have passed had it been possible to reach it on the calendar, but a two-thirds vote of each branch of the Legislature was needed. That could not be mustered. It is intended to reintroduce the measure at the next session, in 1929.

Honor Mr. Senter at Dinner

A testimonial dinner in honor of Ralph T. Senter, president of the Philadelphia Rapid Transit Company, Philadelphia, Pa., is to be held on July 7 at the Ritz-Carlton, Philadelphia. Members of the dinner committee are Robert P. Hooper, Joseph A. Queeney, Andrew J. Carty, Ernest T. Trigg, Stotts J. Cotsworth, William I. Stanton, Benjamin A. Hageman, Jr., and Ellis Ames Ballard, chairman. Mr. Senter was recently made president of the Philadelphia Rapid Transit Company.

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Grand Rapids Sees Rail Coach Christened "Lindy"

Thousands of Grand Rapids, Mich., residents gathered at Ramona Park on June 19 for the christening of an electric rail coach of the Grand Rapids Railway in honor of Col. Charles Lindbergh. Carl Batts, president of the Grand Rapids Flying Club, urged the crowd to dismiss fears of flying and to support the local airport. The coach was sponsored by the flying club.

Lee H. Bierce, secretary of the Association of Commerce, dedicated the coach. During the ceremony planes circled over the crowd while sixteen musicians of the Elks band in two air liners played "The Spirit of St. Louis." The program was broadcast.

The new car, which was built in the shops of the Grand Rapids Railway, was in keeping with the quality of the new rolling stock. The outside decorations included the name of Colonel Lindbergh and the flying insignia with the American shield and star signifying a senior aviator. Above the flier's name was a picture of his plane, the Spirit of St. Louis, while a crayon portrait was hung above the bulletin board inside. An airplane propeller, presented by the Stout Air Service, was placed on the front of the car.

Car operators were known as pilots and were dressed in the one-piece flying uniform with goggles and helmet. The car was placed in regular service on June 20.

New York Commission Considers Fare Pleas

The Public Service Commission, in session at Albany on June 29, granted a rehearing to the city of Buffalo on its order dated June 8 fixing rates of the International Railway in that city, but denied that part of the petition asking that the commission rescind the order fixing rates. There was no memorandum. The rehearing will be held at Buffalo July 13, 1927. Commissioner Lunn voted with Chairman Prendergast and Commissioners Van Namee and Brewster on that part of the order providing for a rehearing, but voted in the negative on the denial of the petition for a rescinding of the order of June 8.

The Public Service Commission denied the petition of the city of Albany for a rehearing. In the latter case the memorandum of Chairman Prendergast was approved by Commissioners Van Namee and Brewster, Commissioner Lunn voting in the negative but without submitting a memorandum.

Backing Up the Railway

Officials of the Lincoln Traction Company, Lincoln, Neb., have succeeded in interesting the business men of the city in its problem of how to keep on while gross receipts fail to meet bond interest. Several meetings have been held at which the sentiment was unanimous that the company should be favored whenever possible and nursed along so as to make it an asset rather than a liability. The sentiment was unanimous also that the company should be relieved of the occupation tax of 1 per cent of its gross earnings and that if the main thoroughfare is repaved as proposed it be relieved of any cost in connection with it. It proposes to run buses instead.

Amalgamated Meets in Birmingham in September

The twentieth convention of the Amalgamated Association of Street and Electric Railway Employees of America will convene this year on Sept. 12, in Birmingham, Ala. International President W. D. Mahon is hopeful that this will be the largest convention in the matter of attendance ever held within the association.

Resumption of Railway Service in Tampico Not Expected

The prospects of a resumption of railway service in Tampico, Mexico, a city of 80,000 inhabitants, appear remote at the present time, as the Tampico Electric Company has declined a continuance of the public service conducted at a great loss. In fact, the eventual retirement of all operations of the company at Tampico is envisaged if adverse conditions continue as in the past to make further operations unprofitable.

The railway service of the city was permanently discontinued on March 31, 1927. The action followed the failure of a series of conferences held by the Tampico Electric Company with the Union of the Street Car Workmen and the State Labor Board. For two days early in the month the service had been stopped, but the company resumed operations until the end of the month, pending further negotiations sought by the state and municipal authorities for the purpose of finding a working basis for the continuance of operations. As was noted in the ELECTRIC RAILWAY JOURNAL issue of April 9, the company will continue to operate the electric railway route which connects Tampico with the gulf coast, known as the "Miramar" route, a distance of 9.9 km. This line is not parallelled by a road and therefore does not suffer from the competition of jitney service.

According to recent information supplied by the Department of Commerce, under the terms of the agreement for suspension reached with Emilio Portes Gil, the Governor of the state, wages will be paid for 54 days to the 230 workmen who are necessarily laid off by the suspension of services.

The suburban development of the Tampico district has followed closely in the path of the electric lines, and the complete cessation of this service is proving a considerable hardship to the general public. The jitney service, supplied by low-priced American cars, is unsafe and unsatisfactory.

Franchise Talk Renewed in Omaha

Little headway has been made in the attempted negotiations between the Omaha & Council Bluffs Street Railway, Omaha, Neb., and the city over a new franchise. Fred P. Hamilton, president of the company, in an effort to get the matter lined up where a decision may be reached, has in effect informed the city that it is expected to choose between a suit being pressed in federal court to establish the company's claims to a perpetual franchise and submitting to the voters in the early fall the matter of a 30-year franchise.

City Attorney VanDusen will advise the Council that the choice as to what the next step shall be rests with the company. He says he cannot undertake to handle both the federal case and the franchise ordinance negotiations. He professes to prefer going ahead with the franchise case in court, believing that the city can win it. Councilmen insist on knowing whether the promise of the company that it will forego its claim to a perpetual franchise means a dismissal of the pending perpetual franchise case, begun by bondholders.

John L. Webster, attorney for the company, says so many matters must be taken into consideration that the subject is one for negotiations and not for instant decision.

"When You and I Were Young"

Twelve employees of the Boston Elevated Railway, Boston, Mass., who have been in the service of the company 50 years or more were entertained at luncheon by Edward Dana, the general manager, recently. As reminders of the occasion autographs of the men present were written on a sheet of the trustees' paper and a photograph was taken. After the repast there were comments and talks evocative of memories of Boston when these men were "tow boys."

FREIGHT SERVICE TO BE ABANDONED.—Announcement has been made by the Springfield Street Railway and the Worcester Consolidated Street Railway that their trolley freight service in Massachusetts will be discontinued on all lines on July 1.

TRAMWAY ROUTES IN BOOKLET.—All points of interest in Halifax, N. S., can be reached by the street cars. How to arrive at the Public Baths, the "Dingle" and Point Pleasant Park are graphically and colorfully told in a booklet issued under date of June by the Nova Scotia Tramways & Power Company, Ltd. Regular passengers and visitors in Halifax are also told about traffic observations, non-delay service and special stops.

ROUTE NUMBERS ON CARS.—The Springfield Street Railway, Springfield, Mass., has begun putting route numbers on the tops of its cars and by July 15 will have this work completed on all lines. The numbers are 10 in. high. They will be illuminated at night.

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Recent Bus Developments

Bus Substitution Order Sustained

Order of the Department of Public Works of the State of Washington granting the application of the Pacific Northwest Traction Company for permission to substitute buses for part of its interurban service between Burlington and Bellingham, Wash., has been sustained by decision of Judge D. F. Wright of the Thurston County Superior Court, in the appeal and review taken by protestants. The applicants for writ of review were the Chambers of Commerce of Mount Vernon, Burlington, Anacortes and Sedro Woolley and the Chamber of Commerce of Skagit County and Board of County Commissioners. It was the plan of the Northwest Traction Company to alternate buses with interurban trains maintaining between the two the same schedule. It is expected the case will go to the Supreme Court of the state.

Another New York Company to Seek Bus Rights

Federal Judge Harry W. Goddard has signed an order authorizing N. A. Elsberg and Michel Kertland, receivers for the Eighth & Ninth Avenue Railway, New York, to join in an application for the substitution of buses on the company's lines. A petition is also to be sent to the Board of Estimate and Apportionment for a modification of the company's charter which will permit this substitution. Stockholders of the company favor the use of buses.

Expansion of Service Effective

The new combination bus-electric railway service between Milwaukee and Janesville will be 30 minutes faster than the present bus line. Direct bus service to Delavan, Elkhorn and East Troy, connecting bus service to Racine, Lake Geneva and Burlington and operation of parlor car motor vehicles on all these lines have been installed by the Wisconsin Motor Bus Lines and the Milwaukee Electric Railway & Light Company. The bus line service has been connected up with the new rapid transit railway line operating from Milwaukee to Burlington and East Troy.

St. Louis Is Catering to Opera Lovers

The St. Louis Bus Company, auxiliary of the United Railways, St. Louis, Mo., and the People's Motorbus Company have installed special bus service for the St. Louis Municipal opera season at the Municipal Theater in Forest Park, which opened on June 6 and which will continue for twelve weeks.

The St. Louis Bus Company is operating a special line along De Baliviere Avenue from Delmar Boulevard to the theater. The Olive-Delmar, Olive-University and Union Boulevard street car lines make connections with and furnish transfers to this bus line. At the close of the show the buses give transfers to the street cars.

The People's company is operating four direct lines to the theater and its schedules are so arranged that the buses will arrive at the theater at regular intervals each evening beginning at 7:15 p.m. A fleet of buses is also assembled to be ready at the close of the performances so there will be no delay in transporting patrons to their homes.

During its first week the opera played to 40,000 patrons and most of them were transported by the bus lines, as owners of automobiles have found parking within a convenient distance of the opera a big problem and have turned to the almost door-to-door service furnished by the St. Louis Bus Company in conjunction with the United Railways and also by the People's Motorbus Company.

Louisville Case Decided

Court Holds Franchise Necessary for Intracity Systems—Intercity Lines Exempt—Competition of Railway Restrained During Time Case Was Being Tried

BUSES cannot operate on the streets of Louisville, Ky., without a franchise, the Court of Appeals ruled on June 24 in affirming the decision of the Jefferson Circuit Court in the Louisville bus case.

The People's Transit Company sought to operate buses on Broadway in Louisville, contending it paid license and city taxes. The Louisville Railway contended that, according to the constitution, the transit company must obtain a franchise to operate its buses. The lower court upheld the railway and the Court of Appeals affirmed the decision.

The case does not involve the interurban carriers, the court ruled, saying:

> It requires no stretch of reasoning to apply that principle to an interurban carrier, using motor power and employing vehicles supported by rubber-tired wheels instead of iron wheels constructed to run on the rails of a fixed track. Since therefore, terminal cities and those traversed by an interurban carrier may not exact from them a franchise under Section 164 of the Constitution this alarm disappears.

When the case was pending in the Louisville Court, Robert L. Page, attorney for the Transit Company, said he would ask the Council for a franchise to operate buses in Louisville. This was considered the most important business that would come before the new Democratic Council.

Many Briefs Filed

Seven briefs were filed in the case involving the right of buses to operate on the streets of Louisville without a franchise. The railway and the transit company each filed three briefs, while the Consolidated Coach Corporation filed an *amicus curiæ* brief. The latter, while not litigants in the case, claimed it might have been affected by the intercity franchise question, as would all the bus lines run in the state.

The railway in its third brief sought to show that the question concerned only the operation of intracity buses and the intercity and intercounty buses would not have been affected by the decision.

It said the chief question was that the transit company could conduct a transportation system in Louisville without first acquiring a franchise to do so, and pointed out that under Section 164 of the State Constitution the right must grant them a franchise, which must be auctioned to the highest bidder.

Operation Halted by Injunction

The temporary injunction was granted and the bus company appealed the decision, pointing out that licenses could be obtained only for a year at a time and that a long-time franchise would not be in accordance with the existing one-year laws for the operation of buses.

The Court of Appeals declined to decide the case on temporary injunction proceedings, recommending that the case be remanded to the lower court for trial on its merits. In the meantime the injunction preventing the operation of the transit company buses was permitted to stand. The Appellate Court said that the case as it was then presented involved questions of far-reaching importance. It was shown that the counties and cities through which intercity buses operated might require franchises if the intercity companies were bound by franchise statutes.

The railway contended that the motor transportation act of 1926 governed the operation of intercity and intercounty bus lines and that intercity modes of transportation were affected by the franchise right. Its contention was that a decision in favor of the transit company would bring about an old transportation operation conducted by a new agency, outside of the uniform plan and regulation set out in the present constitution, while a decision in their favor would bring about the operation of a new transportation agency, the bus, under the uniform plan of regulation set out in the present constitution.

The court declined to decide whether the railway had a right to operate its

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buses without a special franchise and, likewise, declined to decide if the operation of the railway buses were permissible under its general franchise.

Just what the next move will be is a matter of speculation. Attorneys Robert L. Page and Allen P. Dodd, for the Peoples Transit Company, say that a franchise will be drafted and offered before the City Council.

There has been talk to the effect that the Louisville Railway cannot bid on a competing form of service. However, the Kentucky Carriers, the bus subsidiary of the Louisville Railway, probably could not be barred from doing so, while there probably would not be anything to prevent individuals or firms from buying a franchise and later assigning or selling it.

G. B. Powell, Kentucky Carriers, remarked that there was nothing that he could say, as officials of the Kentucky Carriers and the Louisville Railway were waiting for the return of President James P. Barnes from the East. He did say, however, that he believed that during the next few weeks the local transportation problem would be well along toward settlement.

Allen P. Dodd, one of the attorneys for the Peoples Transit Company, is a factor to be reckoned with in the new Democratic control of city and county, seated on June 27, as a result of the Governor appointing the entire defeated Democratic ticket of 1925, to fill vacancies caused when the Court of Appeals declared vacant all offices filled in the 1925 election. Mr. Dodd led the fight which resulted in the ousting of the Republican control. He has just been named by Mayor O'Neal as a member of the Board of Safety. He is popular with the entire party, including the new Democratic Council.

Action Brought Against Railway

The Massachusetts Coach Company, Boston, Mass., operating bus lines in Boston, Quincy and Milton, has filed a bill in equity in the Suffolk County Superior Court to prevent the Eastern Massachusetts Street Railway from operating buses from the Milton-Quincy line to Quincy Square. It is alleged that the railway's license has not been approved in writing by the Mayor of Quincy. The bus company further states that it holds all the licenses necessary to operate the various lines in the Quincy section.

Substation Refused in Tarrytown

The Third Avenue Railway, New York, received on June 27 a setback to its plan to substitute buses for its trolley cars in Tarrytown, when the village trustees, in executive session, denied the application of the company. The railway had sought a 25-cent fare for a bus ride between Tarrytown and White Plains, in place of the 10-cent fare now charged on the trolley cars. Three petitions containing hundreds of signatures were sent to the board asking the request of the company be denied.

Substitution Sought by Binghamton Company

The Binghamton Railway, Binghamton, N. Y., through William M. Riley, receiver, has petitioned the Public Service Commission for approval of a declaration of abandonment of its lines known as the Rockbottom line and the Spring Forest line. At the same time the Binghamton Railway Bus Lines, Inc., asked for a certificate for the operation of bus lines on the routes of the railway sought to be abandoned. A public hearing will be held on the petition.

Appeal for Bus Lines in Birmingham

Citizens of Bessemer, South Park, Ensley and other suburban sections of Birmingham, Ala., are requesting the Birmingham Electric Company to install buses in a large section well populated in that district not now reached by railway lines. The company is now operating a number of buses in outlying districts unreached by its car lines. Birmingham has grown so rapidly in the last few years that the company has been unable to extend its railway to reach some of the new sections.

New Bus Service Started in Portland

The Portland Electric Power Company, Portland, Ore., recently announced a new Powell Valley bus line service, with a 10-cent cash fare. The present Powell Valley bus line will be discontinued and a new routing followed. Regular service will be maintained from 6 a.m. to 12:30 a.m.

Railway tickets of all classes will be honored on the new line, except school tickets, in lieu of the 10-cent cash fare, with a charge of 2 cents each for tickets so honored. School tickets will be honored for a full fare the same as on street cars. Transfers will be issued to the new line from street car and bus lines and a charge of 2 cents will be made for each transfer so issued except for transfers issued on school tickets, on which there will be no additional charge.

The railway fare in Portland is 8 cents, with tokens of six at 45 cents and 50 tickets for $3.65. School tickets are 25 for $1, with two weeks the minimum time in which the card of any one pupil will be honored at the ticket office. School ticket are honored on Sundays until 6 p.m. and during sessions of summer school.

Abandonment of the Brooklyn Street car line in Portland, Ore., because it does not pay and because the district will be served by the Powell Valley bus line, has been asked of the City Council by W. H. Lines, vice-president of the Portland Electric Power Company. The company plans to extend its bridge transfer cars from Grand Avenue at Lincoln Street to connect with the Powell Valley bus line. This change will take effect, if authority is granted, July 1, when the new bus line begins operation. Patronage on the Brooklyn line has been falling off steadily for several years, Mr. Lines said, and that the district can be taken care of by the extension of the bridge transfer line and the Powell Valley bus line.

Partial Substitution by Buses

Buses are replacing cars on the Palmer, Ware and Monson lines of the Springfield Street Railway, Springfield, Mass. Three motor coaches are being assigned to the district for regular use. Forest Lake is no longer on the regular route from Palmer to Ware, but will be covered by special service. The schedule will approximate that of the old service, except between Palmer and Ware hourly service will be given throughout the major part of each day, to conform to the Saturday afternoon and Sunday afternoon schedules previously maintained.

Bus Route Authorized

The Public Service Commission on June 23 granted the petition of the Capitol District Transportation Company, Inc., subsidiary of the United Traction Company, for the operation of a bus line between Rensselaer and Albany.

At the present time the company is operating buses in Rensselaer following abandonment of certain railway lines and proposes to operate the bus route granted in conjunction with its motor routes in Rensselaer providing three lines of traffic. A ten-minute schedule will be maintained on the Third Street line, a fifteen-minute schedule on the East Street line and a 30-minute schedule on the Riverside Avenue line, with shorter schedules during rush hours. Transfer privileges will be afforded to the lines of the United Traction Company.

PATRONS PETITION FOR BUSES.—Patrons have asked the Connecticut Company, Hartford, Conn., to substitute bus service for the trolleys on Vine Street. Property owners are urging the move to prevent widening the street, if possible, by the city.

BUS ROUTE PROPOSED. As soon as the middle bridge over the Menominee River is opened for two-way traffic the Menominee & Marinette Light & Traction Company, at the request of the City Council, will apply to the Railroad Commission for permission to run buses from Dunlap Square, in Marinette, to Electric Square, in Menominee.

WOULD RUN BUSES TO CONNECT WITH TRAIN SERVICE.—The Napa Valley Bus Company has applied to the California Railroad Commission for authority to issue and sell 500 shares of its capital stock, at $100 a share for the purpose of financing the operation of auto stage service between Calistoga and Vallejo. This service will be in connection with the train service of the San Francisco, Napa & Calistoga Railway.

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Financial and Corporate

Interborough Reports for Eleven Months

For the eleven months ended May 31, 1927, the total revenue of the Interborough Rapid Transit Company, New York, from all sources was $58,139,317, an increase of $1,371,678 over the corresponding period of last year. Expenditures for operating and maintaining the property increased $2,192,089. Taxes payable to the city, state and the United States increased $157,315. Rentals and other income deductions decreased $105,448. The net result for the eleven months was a surplus of $1,365,652, a decrease of $872,279. The comparison with last year is influenced by the strike during last July, as well as the fact that in July of last year there was a lump sum payment of $770,000 on account of the new advertising contract, against which there was no similar payment this year. The net result for May, 1927, was a surplus of $412,477, an increase of $24,012 compared with May of last year.

$912,735,000 Value Placed on New York's Transit Lines

At the session on June 27 in the inquiry to develop a plan for transit unification in New York City Norman C. Hill, engineer accountant for the Transit Commission, said that he began last January to bring the valuation of New York tractions made in 1921 and 1922 down to date and that since that time there had been some 55 to 65 men employed on the work. As of June 30, 1926, the valuation placed on the Brooklyn-Manhattan Transit Corporation's investment in its system on the basis of original cost is $165,902,000. The valuation of the Brooklyn-Manhattan Transit, excluding surface lines and real estate not used for railroad purposes, was $118,260,000. The valuation of the Brooklyn-Manhattan Transit's investment on the same date in property recapturable by the city and on the basis of original cost was $63,602,000.

The commission's valuation of the Interborough's investment in subway lines under contracts 1, 2 and 3 is $166,910,000 as of June 30, 1926. The value of the Interborough's investment on the basis of cost in the elevated lines of the Manhattan Railway is $43,815,000. The Manhattan Railway's investment in the original elevated property was put at $71,419,000 as of the same date. The city's investment in the subway lines of the Interborough is $177,000,000 and in the subway lines of the New York Rapid Transit Company $167,686,000. The commission's valuation on the cost basis of all traction lines in New York City as of June 30, 1926, excluding the Hudson & Manhattan Railroad, and including the city's investment, was $912,735,000.

Samuel Untermyer, special counsel for the commission, said that he would combat the reproduction cost less depreciation theory of valuation. He then compared the reproduction cost less depreciation valuations by the companies in 1921 and 1922 with the cost figures for valuation by the city at the same time. On these different bases the company valuation of the B.-M. T. and Brooklyn City surface lines in 1920 was $193,883,895, against the city's original cost valuation of $74,895,573. The company valuation of the New York Rapid Transit Corporation was $176,150,041, against the city valuation of $104,945,114. The company valuation of the Interborough Rapid Transit Company's investment was $233,747,697, and the Transit Commission's valuation was $189,497,127. The latter figure is subject to a reduction of $11,000,000 for cost of reconditioning the property.

Equipment Trusts Sought by South Shore Line

Authority to issue $710,000 par value of equipment trust certificates is asked in a petition filed with the Illinois Commerce Commission and the Public Service Commission of Indiana by the Chicago, South Shore & South Bend Railroad. Proceeds from the sale of the certificates will be used to finance in part the purchase of twenty new passenger cars, locomotives, flat cars and other equipment. The certificates will mature serially in annual installments over a period of ten years and will bear interest ranging from 4½ to 5½ per cent.

Pittsburgh Does Well

Net Holds Up Despite Decrease of $113,998 in Gross Earnings—Personnel Sold on Idea That Good Feeling and Harmony Will Achieve Success

DURING nearly the entire year 1926 the coal mining industry in Pittsburgh, Pa., was at a standstill, and this subnormal condition had its effect on the earnings of the Pittsburgh Railways, which show a decline of $113,998 in passenger revenue. This result was very disappointing. On the other hand, railway operating revenue from other sources increased $27,532, and by close supervision, economies and competent labor a reduction of $137,344 was made in operating expenses, excluding taxes. Despite this decline in gross receipts, the company furnished to the people of the Pittsburgh territory 1,668,599 more car-miles and more than 26,000,000 more rides than in 1925, thereby bringing the average fare per ride to 5.37 cents. This compares with 6.73 cents in 1923 and 5.78 in 1925.

The company has been steadily making headway since it emerged from receivership three years ago. It is immeasurably better equipped today to render service than ever before in its history. It is apparent that adversity has taught the company many lessons, and with fresh spirit and high resolve it is moving forward, manned by men who are convinced of the value of service and sold on the proposition that good feeling and harmony within as well as outside their ranks will achieve success. The management feels confident that the year 1927 promises still finer results, toward attaining which it is sure the best efforts of every officer and man will be exerted.

A plan of readjustment of the capital structure of the railway is still undergoing careful study. The officers realize that it is desirable to bring into one consolidated company the ownership of all of the leased and operated properties and to simplify the present situation. This complex problem, rendered more difficult by the many individual security issues outstanding, presents a number of angles for solution. In the comparatively near future a plan is expected to be presented which the company, with the support of the security holders, will be capable of executing. Meantime the arrangement of continuing to pay interest on matured bonds of underlying companies, in which the holders of more than 91 per cent of such bonds are participating, remains operative.

Operations under the partnership agreement with the city of Pittsburgh and certain municipal units of Allegheny and Washington Counties were conducted throughout the year to the satisfaction of all partners. The representatives of the people and municipalities

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE PITTSBURGH MOTOR COACH COMPANY FOR THE YEAR ENDED DEC. 31, 1926

Operating revenues		$301,521
Operating expenses:		
Maintenance of equipment	$60,516	
Traffic	1,570	
Transportation	132,311	
General administrative	11,181	
Other general	20,633	
Taxes	15,877	
Total		242,090
Net revenue from operations		$59,430
Non-operating revenue—interest and discount		1,419
Gross income		$60,850
Income charge—interest on unfunded debt		6,351
Net income before appropriation		$54,498
Appropriation for depreciation		37,405
Net income for the year		$17,093
Surplus, Jan. 1, 1926		3,028
Additions to surplus—miscellaneous (net)		729
Surplus, Dec. 31, 1926—per balance sheet		$20,851

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STATISTICS OF THE PITTSBURGH RAILWAYS

Miles of road	329.56
Miles of track	590.77
Carhouses operated	20
Car shops	2
Trainmen's quarters and administration buildings	12
Passenger cars—motor	1,318
Passenger trailers—motorized	70
Passenger trailers—non-motorized	159
Miscellaneous Cars:	
Freight	9
Snow sweepers	39
Snow plow	1
Snow scrapers	16
Sand cars	28
Flat cars	83
Work cars	94
Total cars	1,817
Passengers carried (revenue)	267,721,759
Passengers carried (revenue, free transfer and free)	312,425,564
Passengers carried (revenue, free transfer, free and estimated extra rides on passes)	396,679,675
Car-miles operated (total)	41,357,208
Car-hours operated (total)	5,012,828
Passenger revenue per revenue car-mile (cents)	51.81
Average fare per revenue passenger (cents)	7.95
Average fare per passenger (revenue, free transfer and free) (cents)	6.81
Average fare per car ride (total passengers carried) (cents)	5.37

on the Traction Conference Board, created by the agreement, have exhibited a very friendly spirit and ably cooperated with the management to the end that Pittsburgh might be supplied with transportation adequate to meet its many requirements.

There were placed in operation 50 new trolley cars, bringing the total up to 378 new cars put into service since the railway came out of receivership in 1924. These new cars are of the low-floor, center-entrance type, much lighter than the cars of earlier design and more economical to operate. In addition, 30 double-end cars were remodeled for one-man or two-man operation, and the usefulness of much of the old equipment has been increased by motorizing certain of the trailers so that the combination of the motor car and the motorized trailer may be operated as one unit. The reconstruction program also resulted in the renewal of 33.69 miles of trackage on the system.

The first full calendar year of operation of the Pittsburgh Motor Coach Company, affiliated with the railway, resulted in a net income of $17,093 after providing for all charges, including depreciation. The base fare is 25 cents. Results, considering certain adverse operating conditions, were satisfactory. At the beginning of the year 22 coaches of various makes and types were owned. During the year nineteen coaches were purchased and seven were sold. The total number of coaches owned at the close of the year was 34, including eight double-deck coaches. The six coaches placed in operation on the Point Breeze route are the latest word in motor coach efficiency and comfort. The new models, called "parlor cars de luxe," are equipped with balloon tires and air-cushion individual seats, arranged two on one side of the coach and one on the other with an aisle between. The establishment of additional lines during 1927 is contemplated, and this is expected to add to the favorable position of the company and of the Pittsburgh Railways.

The management makes full acknowledgment of the part played by the employees in the work of the company.

SUMMARY OF INCOME OF THE PITTSBURGH RAILWAYS FOR THE YEAR ENDED DEC. 31, 1926

(Prepared in accordance with the terms of the agreement between the city of Pittsburgh, sundry other municipalities, the Philadelphia Company and the Pittsburgh Railways)

Gross revenue from street railway operations		$21,727,230
Operating Expenses:		
Maintenance of way and structures	$1,159,616	
Maintenance of equipment	1,273,771	
Traffic	157,523	
Power	1,991,606	
Transportation	7,414,621	
General	993,130	
Miscellaneous	1,665,961	
Depreciation	2,053,457	
Taxes	609,932	
Total		17,319,621
Net revenue from street railway operations		$4,407,608
Auxiliary Operations:		
Operating revenues	$161,129	
Operating expenses (including depreciation)	137,392	
Net revenue from auxiliary operations		23,737
Total net revenue from operations		$4,431,345
Non-Operating Revenues:		
Rental of real estate and buildings	$21,461	
Interest and discount	172,703	
Miscellaneous	4,188	
Total	$198,352	
Non-operating expenses	9,272	
Net revenue from other operations		189,079
Gross income		$4,620,425
Income Charges:		
Items under agreement:		
Return of 6 per cent on property valuation of $62,500,000	$3,750,000	
Return of 6 per cent on additional capital for new property	345,600	
Payments to county of Allegheny, city of Pittsburgh and other municipalities in lieu of licenses and paving assessments	414,604	
Amortization of debt discount and expense on additional capital	67,325	
Items not under agreement:		
Interest on judgments and settlements	382	
Rental of Seventeenth Street incline plane	7,155	
Total		$4,585,068
Net income for the year		$35,357

STATISTICS OF PITTSBURGH MOTOR COACH COMPANY

Garages operated	1
Routes operated	5
Route-miles operated (single way)	18.60
Coaches owned	34
Revenue coach-miles operated	752,497
Passengers carried	1,149,283
Passenger revenue per revenue coach-mile (cents)	39.78
Average fare per passenger (cents)	24.32

The officers say that the year's accomplishments were made possible largely through understanding and harmony with the employees. This was true of employees in every department. The statement of the management was to the effect that the co-operation of the employees had been of genuine, helpful sort. Among other things, the management pensioned 23 men during the year under the retirement plan.

Deficit in Toledo in May

Operations of the Community Traction Company, Toledo, in May resulted in a deficit of $25,010 and brought the net deficit in the stabilizing reserve to $1,002,954. Railway and coaches carried 3,931,601 revenue passengers, compared with 4,178,773 revenue passengers in the similar month last year. Total revenue in May was $294,256 and combined operating and maintenance expense was $220,447. Coaches handled 224,074 passengers with revenue of $20,905 and costs of $21,214.

Net Up in Dallas Despite Decrease in Gross

Net income of the Dallas Railway & Terminal Company, Dallas, Tex., for the year ended April 30, 1927, was $62,389 greater than for the similar period ended April 30, 1926. This showing was accomplished in the face of a drop of $58,339 in gross income. It was made possible through the reduction of operating expenses by $120,729. The gross income for the 1926-27 period was $3,396,559, compared with $3,454,898 for 1925-26. Operating expenses in 1926-27 were $2,591,743 and for 1925-26 they were $2,712,471. The number of passengers hauled decreased by 4,028,726. In 1925-26 the company carried 64,972,644 and in the year just closed 60,943,918. The city permits the company, according to the franchise, to earn a return of 7 per cent on a property valuation of $10,880,000.

Balance Lower on Detroit Municipal Property

For the year ended May 31, 1927, the railway operating revenue of the Department of Street Railways at Detroit, Mich., was $21,544,271, against $23,129,429 for the year ended May 31, 1926. The coach operating revenue was $2,880,899, against $1,272,736. Total revenue from all sources was $24,694,494, against $24,630,352 for the year ended May 31, 1926. Railway operating expenses were $16,227,860, against

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$17,444,246 for the previous year. Coach operating expenses were $2,609,765 and $1,266,845. This gave a total operating expense of $18,837,625 and $18,711,092 for the 1927 and 1926 periods respectively. Net revenue from all sources was $5,856,869, against $5,919,260 for the year ended May 31, 1926.

After the consideration of total deductions the net income was $3,190,304 in the 1927 period, against $3,241,729 for the year ended May 31, 1927. The balance for the period was $590,076, against $572,639. The total number of railway passengers was 462,119,489, against 497,791,761. Total coach passengers numbered 36,080,696, against 16,963,104 in 1926.

Surplus Before Sinking Fund in Terre Haute

The Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., finished the year 1926 with a deficit of $79,157. Freight earnings were $593,330, compared with $561,680 in 1925. For the year there was expended and charged to capital account $8,173 on owned lines and $273,861 on leased lines. The amount of $232,726 was deducted from net earnings for account of sinking funds, although the principal of the sinking fund of the Terre Haute, Indianapolis & Eastern Traction Company's first and refunding mortgage was not paid because money was needed for capital expenditures. On Dec. 31, 1926, the bonds held for sinking funds amounted to $1,359,109. These facts were contained in the annual report to the stockholders.

The report states that plans for the merger of the Terre Haute, Indianapolis & Eastern Traction Company and certain subsidiaries and the Central Indiana Power Company and its subsidiaries into the Indiana Electric Corporation are progressing in a satisfactory manner. Circular letters have been mailed to the stockholders and bondholders explaining the plan and requesting the deposit of their securities with certain banks and trust companies each represented by a committee. Depositors will receive negotiable depositary receipts. At the present time a substantial majority of these securities has been deposited and others are coming in from day to day.

During the year the company purchased nine buses for use in Terre Haute and two passenger cars were purchased and reconditioned.

Total track mileage was 430.87, comprising 383.59 interurban and 47.28 city lines. Total main line route mileage was 433.07.

Appended to the report are statistics and data of subsidiary companies.

12-Mile Pennsylvania Road Would Suspend

Owners of the Pennsylvania & Maryland Street Railway, Elk Lick, Pa., which property was acquired recently by the Penn Public Service Corporation, along with that of the Meyersdale Electric Light, Heat & Power Company, have applied to the Public Service Commission for permission to abandon the line between Meyersdale and Salisbury. A bus line has been established between Cumberland, Md., and Meyersdale, and as soon as the railway is abandoned the bus line operating between Johnstown, Somerset and Meyersdale will be extended to the Maryland state line, where connection will be made with through buses between Uniontown and Cumberland, Md., and points east and west. The company operates 12.5 miles of line.

Valuations in Colorado Increased

The Colorado tax commission has raised the valuation of public utilities $7,000,000. Although valuations on certain steam properties were doubled, the electric railways were not so affected. The old and new valuations on the latter properties follow:

	1926	1927
Denver & Intermountain	$527,860	$527,860
Denver Tramway Corporation	12,251,900	12,251,900
Trinidad Electric Transportation Railway & Gas	1,621,500	1,809,240

Record in 1926 a Good One

The Twin City Motor Bus Company, subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., headquarters St. Paul, which operates interurban buses, carried 5,114,834 passengers out of a total of 7,243,969 transported locally by buses in 1926, a report to the Minnesota Railroad and Warehouse Commission discloses. Its gross revenue was $1,204,851 out of a total of $1,277,733 reported by all local companies. Local mileage by all bus companies in the state was 5,579,021, of which 4,977,740 was reported for the 102 buses of the Twin City Motor Bus Company, with 2,450 seating capacity.

Road in Receivership Shows Slight Loss

The report of Franklin T. Miller, receiver of the Boston & Worcester Street Railway, Framingham, Mass., accepted by Judge Crosby of the Supreme Court, shows a deficit for the first three months of 1927, but there is a most encouraging feature in that the passenger receipts, which were $159,210 in January, February and March, 1926, increased to $164,485 in the corresponding months of 1927. Freight receipts for the first three months of 1927 were $41,959 and the income after deductions was $29,648. There has been a very general falling off in freight receipts from $87,635 the first three months of 1923 until the above figure of $41,959 has been reached. Mr. Miller's reports date from Feb. 11, 1925. Since that time the total income has been $1,932,707, and expenses $1,938,946.62, leaving a net loss of $92,623.

Payment on Account of Detroit United Bonds

A. L. Drum, receiver for the Detroit United Railway, Detroit, Mich., has notified holders of that company's first and collateral trust sinking fund five-year 6 per cent bonds that, pursuant to a court order, they will be entitled on and after July 1 to receive upon presentation of their bonds at the Central Union Trust Company, New York, a payment of 6 per cent on account of the principal of these bonds.

INCOME ACCOUNT OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

Year ended Dec. 31, 1926

Gross earnings from operation		$5,611,653
Operating expenses		4,436,221
Net earnings		$1,175,432
Taxes		181,819
Earnings from operation, less operating expenses and taxes		$993,613
Other income:		
Dividends on stocks owned	$139,800	
Interest	49,049	
Miscellaneous	3,051	191,900
Earnings from all sources, less operating expenses and taxes		$1,185,513
Deductions and rentals:		
Bond interest	$728,197	
Dividend rental	227,500	
Interest:		
Interest on notes	$55,847	
Car Trust Equipment Company	4,605	
John T. Beasley trust-purchase cars	1,195	
John T. Beasley trust-purchase equipment	6,600	68,247
Brazil Electric Company rental		5,000
Maintenance of organization, leased lines		3,000 $1,031,945
Surplus		$153,567
Sinking fund		232,725
Deficit		$79,157

EARNINGS AND OPERATING EXPENSES OF THE TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

	1926	1925
Gross earnings	$5,611,653	$5,425,058
Operating expenses	4,436,221	4,268,413
Net from operation	$1,175,432	$1,156,644
Taxes	181,819	153,225

MAINTENANCE EXPENDITURES

	1926	1925
Maintenance of way and structures	$683,616	$613,022
Maintenance of equipment	419,683	358,573
Maintenance of power plant buildings and equipment	128,313	154,780
Total railway maintenance	$1,231,612	$1,126,375
Maintenance of light and power	185,520	203,694
Total maintenance	$1,417,132	$1,330,070

* Denotes decrease.

MISCELLANEOUS STATISTICS

Year Ended Dec. 31, 1926

Passengers carried—Interurban lines	4,399,737
Passengers carried—City lines	20,308,132
Total passengers carried	24,707,869
Freight handled (tons)	163,024
Express handled (tons)	9,584
Car-miles operated—Interurban lines	6,452,906
Car-miles operated—City lines	3,807,196

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Legal Notes

CALIFORNIA—*Street Car Has Right of Way.*

A motorist must yield to street car's right of way, where a reasonably prudent man would foresee a collision. [Dawson vs. San Diego Elec. Ry., 255 Pac., 215.]

COLORADO—*Unsecured Creditors Cannot Receive Cash.*

Unsecured creditors were held not entitled to payment out of cash in hands of receiver, accumulated during a receivership by reason of failure to pay interest on secured indebtedness. The decision to this effect was made notwithstanding that under the plan of reorganization the bondholders agreed that the cash should go to new company as working capital, since it was in no event liable for payment of unsecured claims. Temmer vs. Denver Tramway Co., 18 Fed. (2 Series) 226.]

FLORIDA—*Issues Finding on Injuries Received by Conductor on Street Car.*

Where a declaration alleges a cause of action against a street railway for the wrongful death of one of its conductors caused by the negligence of the motorman, and the allegations do not show negligence of the deceased or that the decedent and the motorman were "jointly engaged in performing the act causing the injury," a demurrer to the declaration was properly overruled. [Tampa Elec. Co. vs. Jandreau, 112 So., 558.]

IOWA—*Rules When Employees' Associations May Contract on Necessary Number of Employees to Run Cars.*

A city has the right and power to designate whether street cars shall be operated by one or more men, but where the city has not exercised regulatory power reserved by franchise ordinance, the street railway and employees' association may contract respecting the number of men required to run cars. [Des Moines City Ry. vs. Amal Association of Street & Elec. Ry. Employees of America, Div. 441 of Des Moines, 213 N. W., 264.]

KANSAS—*Contributory Negligence of Motorist Charged.*

Automobile driver proceeding across a street car track without paying any attention to approaching street car, held guilty of contributory negligence barring recovery. [Gardner vs. Topeka Ry., 255 Pac., 83.]

MASSACHUSETTS—*Not Responsible for Ordinary Jolts and Jars of Street Car.*

Ordinary jolts and jerks of street cars in starting or stopping or in going around curves or over switches are usual incidents of travel, and for injuries resulting therefrom street railroad is not liable. But the sudden stopping of a street car approaching a stopping place with such jolt that it threw plaintiff, a strong, active woman, who had firm hold of iron railing, 5 or 6 ft. onto the floor, with such force as to break one of her bones, held to show negligence in management of car, authorizing recovery of damages. [Warren vs. Boston Elevated Ry., 155 N. E., 871.]

MINNESOTA—*A Passenger Was Injured Alighting From Car. Duties of Company and City Defined.*

Plaintiff, a passenger on a street car, in descending to the street, stepped on a bulge or bump two to five inches high on a creosote block paving which was covered with snow, and fell, receiving serious injuries. It was claimed the street railway company was negligent in failing to select a safe place for her to alight. Held, that it was the duty of the municipality to keep the streets in repair, and it, if anyone, should he held responsible for injuries resulting from street defects; that the defendant cannot efficiently operate its system and exercise the highest degree of care in minutely watching for trivial surface defects such as are incident to traffic and elements, and that defendant meets its full duty toward a passenger in protecting him against surface defects, particularly in a paved street, when it exercises reasonable care in selecting a fairly safe place for him to alight. [Reid vs. Min. St. Ry., 213 N. W., 43.]

MISSOURI—*"Res Ipsa Loquitur" Was Held Applicable.*

Where a passenger in an auto was injured by contact with an insulator at the end of a guy wire suspended over the street constituting an obstruction, the doctrine of *res ipsa loquitur* was held applicable when it was shown that the wire was in an abnormal position and where the person injured, by reason of unfamiliarity with instrumentalities employed by the defendant, can have no information as to the specific character of the negligent act or acts producing his injury. In such a case he need only show control of the instrumentality by the defendant and its usual movements, and it then becomes incumbent on the defendant to explain the casualty, if it can, so as to exclude the presumption of negligence on its part thus created. [Gibbon vs. Wells, 293 S. W., 89.]

NEW JERSEY. — *Pedestrian Reading Newspaper While Crossing Street Hit by Bus.*

A pedestrian who saw a bus about 150 to 200 ft. away when he started to cross the street, continued on, reading his newspaper, and had proceeded about 12 ft. and was near the center of the street when struck by the bus. He was held guilty of contributory negligence barring recovery regardless of the inquiry whether the driver of the bus was negligent, himself, in not observing him. [Petras vs. P. S. Trans. Co., 136 Atl., 189.]

NEW YORK—*Franchise Is Subject to People's Rights.*

The franchise of a street railway to use the city streets is subject to the rights of the public to construct sewers or make such other necessary public improvements, and the expense of protecting, shoring up and supporting the tracks during such work must be borne by the company. It may not impose the cost thereof on the city by simply disregarding notice requiring it to do such work; but the city may cause the work to be done at the company's expense. In this case, the sewer contractor, who performed such work when the company disregarded the notice, was entitled to recover the reasonable costs thereof from the company. [Necaro Co., Inc., vs. Eighth Ave. Ry., 221 N. Y. Supp., 276.]

OHIO—*Bus Service Should Be Adequate.*

In a proceeding before the Public Utility Commission for an extension of an existing bus route, where the evidence shows that the public affected by such proposed extension does not have adequate common carrier transportation service, and that the granting of such extension will serve the convenience and necessity of the general public and eliminate the inadequacy and inconvenience of such lack of service, it is error to deny such extension. The needs of the public are the primary consideration. [Warren-Salem Coach Line Co. vs. P. U. Comm. of Ohio, 156 N. E. 453.]

SOUTH CAROLINA—*Injury Could Be Avoided in Safe and Suitable Conveyance.*

In a suit for injuries to a passenger who tripped on a piece of molding or board in the aisle of a trolley car, the complaint alleging that the injuries complained of occurred as the result of an act of commission or omission of the servants of the defendant in failing to provide a safe and suitable conveyance was held sufficient. It was further held that the defendant, as a common carrier of passengers, is responsible in its duty to its passengers. [Derrick vs. Columbia Ry. Gas & Elec. Co., 137 S. E., 682.]

WASHINGTON—*Motorman Can Assume Passengers Will Exercise Care.*

A street car motorman has a right to assume that other travelers on the street will use ordinary care and may operate his car on this theory until he becomes aware, or should become aware, that the traveler is in danger, or is not using ordinary care. [Yenor vs. Spokane United Rys., 255 Pac., 947.]

WISCONSIN—*Passenger in Auto Held Not Negligent.*

One injured in a collision between a street car and an automobile in which she was riding as a passenger was held not contributorily negligent as a matter of law in not protesting or taking other measures to reduce the speed of the auto, so as to avoid getting on street car track in making turn, nor in failing to look for approaching street car operated at an excessive speed. [Temlicka vs. Mississippi Valley Public Service Co., 213 N. W., 666.]

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Personal Items

William G. Gove Honored Again

In recognition of his continued progressiveness in the railway field, William G. Gove, superintendent of equipment of the Brooklyn-Manhattan Transit Lines, Brooklyn, N. Y., was elected president of the New York Electric Railway Association at its annual meeting at Bluff Point, Lake Champlain, on June 24. This is the second honor within a year conferred on the man who 25 years ago became connected with transit companies in Brooklyn. In November of last year he was elected president of the New York Railroad Club. The radical

W. G. Gove

changes in the character of the service rendered on the Brooklyn lines can be in large measures attributed to his ideas on standardization and reconstruction and to his genius as an organizer.

Before his affiliation with the Brooklyn lines Mr. Gove was with the Boston Elevated Railway, where he also showed his gift for designing equipment. At one time he served with the Cincinnati Street Railway.

Mr. Gove was born in Cincinnati on Feb. 24, 1874. He was educated in the Cincinnati schools and at the Cincinnati School of Technology. After leaving the university he began work in a civil engineer's office.

His record in association work, particularly his work in the interest of the American Electric Railway Association, is well known, he being a past-president of the Engineering Association.

A detailed biography of Mr. Gove with special emphasis on his accomplishments in the shops of the Brooklyn-Manhattan Transit Corporation was published in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 11, 1926.

COL. E. M. STAYTON, for six years city member of the Board of Control of the Kansas City Railways, Kansas City, Mo., was recently named Railways Commissioner of Kansas City and a member of the board of directors of the Kansas City Public Service Company by the Kansas City Council. The position of Railways Commissioner was created in the new franchise recently granted the company and carries duties similar to those exercised by the city member of the former Board of Control.

A. W. Thompson Elected to Another Board

Arthur W. Thompson has been elected a director of the Consolidated Gas, Electric Light & Power Company, Baltimore, and Sir Herbert Holt of Montreal, Canada, and Thomas Aitken of London have resigned from the directorate. Mr. Thompson is president of the United Gas Improvement Company, with headquarters in Philadelphia. His election does not indicate any affiliation between the local utility company and Mr. Thompson's other interests. He was formerly president of the Pittsburgh Railways.

Clinton D. Smith Goes to Cleveland

The Cleveland Railway, Cleveland, Ohio, instituted on July 1 a new department which is known as the department of personnel. Clinton D. Smith, formerly general manager of the Beaver Valley Traction Company, New Brighton, Pa., will be executive head of the department.

Mr. Smith was made general manager of the Beaver Valley Traction Company in 1923. During the time that he has been with that company he has brought the lines to the very front rank of the railway industry, having received favorable mention in the Charles A. Coffin Foundation Award in 1925. Previous to going to the Beaver Valley he was general superintendent of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio. Prior to that he was associated with the Public Service Railway of New Jersey in charge of the schedules and traffic. While on that property he pursued a special engineering course tending to fit him as a traffic expert. He left the New Jersey property in 1916 and accepted the Ohio position.

There will be centralized in this new department under Mr. Smith all activities of employees, inclusive of employment, safety, welfare, athletics, social, civic and educational programs. More or less work of the character mentioned has been carried on by the Cleveland Railway, but with the institution of this department the work will be intensified and enlarged in order that there may be more individual attention given to public and employee relationship. In its functioning the organization will represent equally the employees and management as toward the public and will hold as its ideal the close co-operation and intimate harmony between all of the groups. Active sales training of employees will be another consideration. In carrying this out the employee will be given detailed information of the operation of his particular road, together with such information as may be necessary concerning the transportation business as an industry.

Mr. Smith was born in Harrison, N. J. His early education was received in the public schools. Graduating from high school, he matriculated at the Worcester Polytechnic Institute, Worcester, Mass., in the department of electrical engineering and was graduated in 1912. His technical training included a study of transportation in all its phases.

He is president of the Beaver Falls Kiwanis Club, director of the Beaver Falls Chamber of Commerce, president

C. D. Smith

of the Beaver Valley Management Council and a member of the Ambridge Board of Trade, the Contact Club of the Philadelphia Company and various other local civic organizations.

R. E. Plimpton Chicago Editor

R. E. Plimpton, associate editor of *Bus Transportation*, a McGraw-Hill publication, will make his headquarters in Chicago instead of New York in the future. Mr. Plimpton has been with the magazine since its initial issue in 1922. During that time he has traveled extensively in the Middle West, so that he is personally acquainted with conditions in the bus operating field there. At Chicago he will be in closer contact than heretofore with the manufacturers of buses and equipment, in which field he has specialized.

Mr. Plimpton will continue as chairman of the operation and maintenance committee, Society of Automotive Engineers, which is now engaged in a survey of accounting procedure for motor vehicles in large-scale operation.

Merrill B. Knox, assistant editor of *Bus Transportation* with headquarters in Chicago and formerly on the staff of the ELECTRIC RAILWAY JOURNAL, has resigned to devote his time to research work for a syndicate which plans erection of bus terminals in important cities.

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Manufactures and the Markets

$13,000,000 Will Be Spent by I. R. T. for Automatic Signals

The Interborough Rapid Transit Company, New York City, on June 28 accepted without further public hearings a decree from the Transit Commission ordering the installation of automatic stop signals on all local subway and "L" tracks by June 30, 1937, at a cost that will amount to approximately $13,000,000.

The acceptance was verbal and will be made formal within the next fortnight, according to Arthur G. Peacock of the Interborough.

The cost of the installation, according to the present schedule, will be $9,200,000 on the "L" lines and $3,600,000 on the subway lines, but officials of the transit company expect these figures will be increased. Preliminary work already has been done. Mr. Peacock said, but some adjustment is still to be made in the trackage.

At the Transit Commission's office it was indicated that the formal order of installation of the apparatus was sent to the Interborough offices June 29. The company will have fourteen days in which to affix its official "O. K."

The work will be performed over the entire period of ten years allowed under the order.

Cars of Louisville Railway Being Refurnished

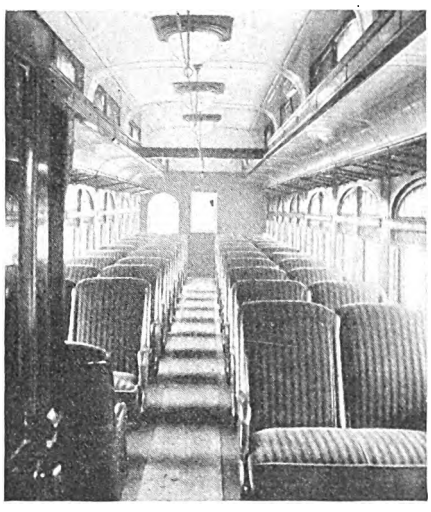
F. H. Miller, vice-president of the Louisville Railway, Louisville, Ky., in a recent interview, said that the company is confining its present activities largely to renewals and replacements. According to him the company is endeavoring to lighten the interior of its cars. The green ceilings have given way to white ceilings, which reflect light much better and make cars brighter and more attractive. Many cars finished in mahogany have been sanded down and revarnished to give the wood a lighter hue. There has also been a good deal of replacement of sun curtains with new ones of dark green, but of a better quality. Motors and other equipment have been overhauled in the company shops and materially improved.

Electric Hoist Manufacturers Against High Prices

An outstanding feature of the recent annual meeting of the Electric Hoist Manufacturers Association was the comment of the retiring chairman on the modern methods used by the association in developing new markets so as to produce larger volume and hence lower overhead costs, rather than restrict production in order to keep up prices. Discussion brought out the fact that domestic business for 1926 in the distribution of electric hoists was practically the same as for 1925, both in number of units and in the value of units, although there was a definite gain in export distribution. The engineering committee presented some very complete and interesting studies on the comparative specifications and details of all the various makes of ½-ton, 1-ton and 2-ton electric hoists.

It was announced that during the year a change was made in the method of reporting statistics so that the quantities are now segregated under standard rating sizes instead of in bulk, giving a better line on the trend of business in the different hoist capacities.

Rehabilitated Trail Cars for South Shore



Typical interior of rehabilitated trail cars, two of which the Chicago, South Shore & South Bend Railroad recently put back in service following their remodeling in the Michigan City shops of the company. The cars had been in service for eighteen years. They have been refurnished along lines closely resembling the company's new rolling stock purchased last July. Orange and maroon is the outside color scheme, while the former black interior finish has been replaced by a glossy walnut stain which blends effectively with the new floor covering of gray battleship linoleum.

Forty-eight Hale & Kilburn individual bucket type seats upholstered in brown and gray striped velour replace the old hard leather reversible type. Among other improvements are Pullman-type dome lights, cabinets for hot water heaters, new head and tail lights and the installation of a multiple-unit control apparatus in the vestibule of each car to permit its use as the head car in the train.

Although the cars have been eminently successful from an operating standpoint, the company will not overhaul any more vehicles of this type owing, it is understood, to the heavy expenses involved.

Preferred Dividend Resumed by Laconia Car Company

The Laconia Car Company, Boston, Mass., declared a dividend of $1.75 on the first preferred stock, payable July 1 to stock of record June 29. This marks the resumption of dividends which have been accumulating since July, 1924. The accumulation amounts to $21 a share.

L. R. Wilder Resigns as Head of American Brown Boveri

Laurence R. Wilder resigned the presidency of the American Brown Boveri Electric Corporation, effective July 1, at which time he became chairman of the advisory committee of the shipbuilding division of the corporation.

Maurice L. Sindeband, a vice-president, has been placed in charge of electrical operations, the corporation's most important business. Whether he will succeed Mr. Wilder as president has not been determined.

The corporation is the successor to the New York Shipbuilding Corporation, whose assets and business were acquired as an American affiliation of Brown, Boveri & Company, Ltd., of Switzerland. Coincident with this announcement, it is understood that the company's annual report is being sent to stockholders.

30 More White Buses for Cleveland Railway

An order for 30 White buses has been placed by the Cleveland Railway, Cleveland, Ohio, increasing the White bus fleet to 90, all in city service co-ordinated with street car operation. The Cleveland Railway also operates 44 White trucks. White buses, 60 of which have been in service, are standard equipment on the Cleveland Railway lines, with the exception of the Carnegie-Clifton Avenue route, on which double-deck coaches are used. The 30 new buses, all of 25-passenger capacity, White Model 50-B, are to be used principally for increasing schedules and extending service on existing routes, according to a program outlined by Joseph H. Alexander, president of the Cleveland Railway, and approved by the City Council.

R. T. Kent Named General Manager of Bridgeport Brass

The appointment of Robert Thurston Kent as general manager of the Bridgeport Brass Company, Bridgeport, Conn., has been announced by Carl F. Dietz, president of the company. Mr. Kent, has a national reputation as an industrial and technical expert. He has al-

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ready assumed his new duties. He is a son of the original author of Kent's Mechanical Engineers' Handbook and was the editor and reviser of the tenth edition of that famous work. Mr. Kent's practical industrial experience began when, as a youth, he was an apprentice in a locomotive machine shop. He was graduated from Stevens Institute of Technology in 1902, and then went into industrial work, with interludes devoted to editing of technical publications and study of management methods.

Experts Studying Design of New Subway Units

WITH a view to obtaining a consensus of opinion by recognized experts in car design and construction, the Board of Transportation of New York City invited the assistance of an advisory committee consisting of James S. Doyle, superintendent of equipment of the Interborough Rapid Transit Company; W. G. Gove, superintendent of equipment for the B.-M.T. System· W. B. Potter, chief engineer of the railway department of the General Electric Company; A. E. Ostrander, assistant vice-president of the American Car & Foundry Company, and W. H. Mussey, mechanical engineer of the Pullman Car & Manufacturing Company. This committee held its first meeting on Thursday, June 23. It will work on the subject in collaboration with the engineers of the board's division of equipment and operation.

Some of the vital subjects which have been submitted for the consideration of the committee and which have already been studied intensively by the engineers of the Board of Transportation are length of cars, number and arrangement of seats, number and size of doors and their location.

The width of the new subway car was determined at 10 ft. at the time the subway structure and station platforms were designed. This is the same width as the cars now in use on the Brooklyn & Manhattan System. The height of the new cars will be approximately 12 ft., the same as now used by both the Interborough and B.-M. T.

The platforms of the stations on the city's new subway are 600 ft. in length. These will accommodate twelve cars of the Interborough type and nine cars of the B.-M.T. 67-ft. length. The platforms in the first subway were originally 200 ft. for local stations and 350 ft. for express stations. In 1908 the express platforms were lengthened to 480 ft. It has been planned for some time to make all Interborough Rapid Transit statins 480 ft., but the traction company has thus far succesfully avoided the disposition of the Transit Commission to have it done by the operating company.

The original platform length in the B.-M.T. subway was 480 ft. Others later installed were made 530 ft. and now the platforms at 40 stations are being lengthened to 530 ft., which will accommodate eight 67-ft. cars. The platforms of the city's new subway stations will thus have 12 per cent more capacity than the longest station platforms on the B.-M.T. system or 30 per cent greater than the seven-car trains now operating.

On the question of car length, the engineers of the Board of Transportation are anxious to arrive at a type of car which will provide a maximum number of seats per car, compatible with speedy loading and unloading, and at the same time be of such design and size as will fit the tubes of the existing I.R.T. and B.-M.T. systems with a view to ultimate unification with these systems.

On the question of arriving at a type of car which will dovetail with the existing city-owned but privately operated underground rapid transit structures, the engineers of the board have met with some obstacles which, while not insurmountable, nevertheless will necessitate alterations and changes in the Interborough subway structure.

The I.R.T. cars are 51 ft. long and 9 ft. wide. The overhang of the station platforms will have to be trimmed back if the platforms are some day to be used to accommodate cars of 10-ft. width. Some of the ducts that carry power and signal wires along the side of the structure will have to be reduced or moved back, signals will have to be reset and in some places cross-over switches, columns, trippers, etc., will have to be relocated.

Consideration has been given by the board's engineers to more than twenty different types or designs of cars. Lengths varying from 51 ft. to 137 ft. have been studied. Doors, singly and in combination, have been considered. Cars having from three to fourteen doors each from 2 to 4 ft. in width have been studied. Car types are largely affected by length of units, by seating capacity and door arrangements.

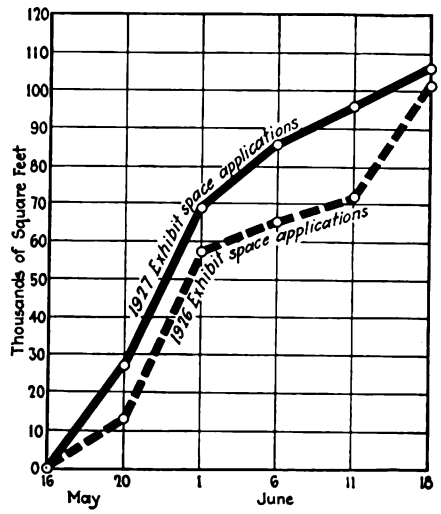
In this regard, surveys have been made during the past few months to determine the maximum dimensions of a car suitable for operation in the subways of the Interborough, which are of smaller dimensions than those of the B.-M. T. lines. These surveys indicate that it will be possible to operate a car 10 ft. wide through most of the I.R.T. subways with comparatively little reconstruction but that the length of the car must be about 54 ft. instead of 67 ft., the present B.-M. T. standard. It is probable, therefore, that the car for the new lines will be nearer the length of the I.R.T. cars but of the same width as the B.-M. T. cars.

One of the most serious objections to the 67-ft. car is the necessity for keeping the doors at the end of the car locked and thus preventing the movement of passengers from one car to another. The use of a shorter car will avoid this difficulty, and it is expected that the new cars, of whatever type selected, will permit free passageway between cars, thus affording passengers an opportunity to find seats in cars ahead or behind the car they enter.

One of the proposals under consideration by the engineers of the board is a car 54 ft. 6½ in. in length, 10 ft. wide, with three doors on each side and seating 52 persons. Such a car can be made up into a train of eleven cars, one more car than now in service on I.R.T. expresses, this train providing seats for 132 more passengers than the ten-car trains of the I.R.T.

Other considerations in 54-ft. car lengths embrace various seating arrangements, some for 56 seats and 60 seats, in the three-door type, 72 seats in a nine-door type, 48 seated in a five-door type and 86 seated in a fourteen-door type.

An A.E.R.A. Exhibit Story Without Words



At the Three-Quarter Post, and Still Going Strong!

This was the status of the A.E.R.A. exhibit committee when it met at Cleveland on June 22 to ratify space assignments amounting to

108,262 Sq.Ft.
to 226 Exhibitors

"An exhibit for every square foot" is the goal.
Sign that blank now, so you won't draw a blank at Cleveland Oct. 3-8.

B.-M. T. Wants New York City to Finance New Cars

The Brooklyn-Manhattan Transit Corporation on June 29 invited the city of New York to finance its equipment needs by issuing $9,700,000 of municipal bonds to be used in purchas-

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ing the additional cars the company needs, these to be leased to it at an annual rental equal to the interest on the city bonds financing the purchase, plus the annual sum needed for sinking fund requirements.

The plan was announced by Gerhard M. Dahl, chairman of the board of directors of the B.-M. T., at a Transit Commission hearing this week.

Lead Market Active; Copper and Zinc Quiet

The non-ferrous metal market behaved just about as expected in the week ended June 29, with prices showing little change from a week ago. Lead was in excellent demand, particularly in the first half of the week, before successive price declines were cabled from London. Copper and zinc were in only moderate demand, and tin could hardly be called active. With the Independence Day holiday on Monday, and virtually all offices closed on Saturday, little activity is expected in the metal market until July 5.

Copper sales at the end of last week, and at the beginning of the week ended June 29, particularly on Thursday, were sufficient to absorb all the 12½-cent copper on the market, which was only a few thousand tons. Some of the larger producers, who had been holding at 12⅝ cents and above all along, were able to sell a little copper on Friday and Saturday at 12⅝ cents, but consumers showed little appetite at that level, and beginning with Monday the price slipped back to 12½ cents, at which several sellers would have been only too willing to book business yesterday and today.

Practically every seller did considerably better than an average week's business in lead; especially in the first half of the week ended June 29 was the market active. Prices were almost without exception 6.40 cents, New York basis, and 6.15 cents, St. Louis, though one lot of prompt lead went for 6⅜ cents June 28, and as high as 6.20 cents, St. Louis, was paid for September shipment. The American Smelting & Refining Company continued its contract price at 6.40 cents, New York. Most of the demand was for prompt and early July shipment.

One lot of zinc for prompt shipment sold as low as 6.15 cents on June 23, but other sales of larger tonnages were made on that day and the two succeeding days at 6.20 cents, St. Louis. A few cars of brass special were also sold at 6.25 cents. In the last three days the business has been pretty well split between 6.20 and 6.225 cents, with an occasional car going at 6.25 cents.

The premium on spot Straits tin, both over forward positions of Straits and over spot 99 per cent, is gradually being cut down. September Straits is now only about 2 cents per pound less than prompt and 99 per cent only 1½ cents less than Straits. The tin market has been rather quiet all week.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	June 28, 1927
Copper, electrolytic, cents per lb.	12.27
Copper wire, cents per lb.	14.50
Lead, cents per lb.	6.40
Zinc, cents per lb.	6.56
Tin, Straits, cents per lb.	66.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.42
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.375
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.53

TRACK AND LINE

JANESVILLE TRACTION COMPANY, Janesville, Wis., has tentative plans under way to rebuild its track on South Main Street in Janesville. It has been decided to install new tracks at the Academy Street railroad crossing. Rebuilding of the track between Pleasant and Galena Streets, it is thought, will be completed this month.

UNITED RAILWAYS OF ST. LOUIS, Mo., has started work on new street car tracks in Olive Street between Channing Avenue and Twelfth Boulevard. It will take four weeks to lay the double track line. There will be no interruption of railway service in the meantime as the old rails will remain in service.

DALLAS RAILWAY & TERMINAL COMPANY, Dallas, Tex., will extend its Lakewood Heights line from the present terminus at Tremont and Ridgeway to Paulus Street, on Paulus to Greenville Avenue and on Greenville Avenue to Llano. The improvement is estimated at more than $59,000, a requisition for which has been honored by the supervisor of public utilities.

SPRINGFIELD STREET RAILWAY, Springfield, Mass., has begun relaying its tracks between Benton Street and Pine Point, in State Street. Similar work soon will be commenced on the section of State Street between Oak and Hancock Streets; on Chestnut Street from the railroad underpass to Linden Street and on Carew Street between Main and Chestnut Streets.

MILWAUKEE RAILWAY & ELECTRIC LIGHT COMPANY, Milwaukee, Wis., has started work on extending two of its lines for a total distance of 1½ miles. The Third-Burnham line will be extended for ½ mile along National Avenue to 93d Avenue, where connection will be made with the Burlington-East Troy line, and an inclosed waiting shelter is to be erected. The name of the station has been changed from Fruitland to 93d Avenue Junction. Rapid transit suburban service will be extended from West Junction to 93d Avenue Junction, a distance of 1 mile.

TRADE NOTES

HYMAN-MICHAELS COMPANY, Chicago, Ill., has appointed the Hofius Steel & Equipment Company of Seattle its representative in Washington and the Northwestern territory.

MASSACHUSETTS MOHAIR PLUSH COMPANY announces the removal of its Boston office from 200 Devonshire Street to 80 Federal Street, 1129 Chamber of Commerce Building.

THE AMERICAN ELECTRIC SWITCH CORPORATION, Minerva, Ohio, with an authorized capitalization of $1,000,000, has been organized and incorporated with J. C. Lewis, president; Arthur Koch, treasurer, and E. F. Rinoehl, secretary. The corporation will manufacture a large and varied line of safety switches, fuse panels, panelboards, switchboards and distribution panelboards for use in industrial plants, etc. All mechanical parts as well as the boxes will be manufactured at Minerva. Sales policies and the sales representatives will be announced at a later date.

HASKELITE MANUFACTURING CORPORATION, Chicago, Ill., announces that the new car of the Grand Rapids Railway recently named after Colonel Lindbergh has Haskelite headlinings and interior linings. This is considered significant because all of the structural wood parts of the Lindbergh plane, the "Spirit of St. Louis," are of Haskelite material.

VALENTINE & COMPANY, New York, have arranged a permanent exhibit of the Nitro-Valspar jewel colors in their New York City office at 456 Fourth Avenue.

ADVERTISING LITERATURE

OHIO BRASS COMPANY, Mansfield, Ohio, recently distributed a large folder descriptive of trolley gears, frog crossovers, etc.

WAGNER ELECTRIC CORPORATION, ST. LOUIS, Mo., is issuing a new catalog, No. 144, describing the Fynn-Weichsel motor, the book is well illustrated with halftone cuts and chart.

CROUSE-HINDS COMPANY, Syracuse, N. Y., is presenting in a very attractive folder, No. 50, the new Obround conduit, Form 7. Orange and black is the color scheme of the new mailing piece.

HEMINGRAY GLASS COMPANY, Muncie, Ind., has issued a catalog describing its complete line of glass insulators, for telephone, telegraph, electric light and power distribution. The line described includes all standard telephone and telegraph insulators and power distribution insulators with voltages up to 11,000. The catalog is well illustrated.

ECONOMY ELECTRIC DEVICES COMPANY, Chicago, Ill., is sending out a two-page folder descriptive of its Economy meters, 746 of which were recently ordered by the Kansas City Public Service Company.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, July 9, 1927 *Number 2*

When the Boss Is Away—the Meetings Suffer

THIS is the open season for sectional association summer meetings. That is as it should be. It is a good thing for railway men to get together, compare notes, exchange experiences and get better acquainted. During the summer months it is a good thing for them to combine work and play. All work and no play dries up the individual—suppresses those human impulses toward social intercourse and good fellowship that round out the mind and furnish the inspiration for greater accomplishment. When the individual becomes so immersed in the day's routine as to lose his perspective, the greatest force for progress and improvement is stifled.

Association meetings afford the opportunity for stimulating enthusiasm and for generating new ideas. That is their primary purpose. Social contact, good fellowship and play are important, but they are secondary. They are merely means to an end and not the end itself. By helping to bring men closer together and to get them better acquainted, the entertainment phases of a meeting help to break down the walls of reticence and tend to stimulate that discussion and interchange of experience from which the real value of a meeting is derived.

Unfortunately, several recent sectional meetings give the impression that the means have become the end; that entertainment and play take precedence over the business sessions; that a few papers and a little perfunctory discussion are used merely as the excuse for attending such a meeting rather than as its primary purpose. Of course, this criticism does not apply to all sectional meetings. Many of them are characterized by active and spirited discussion and by a conscientious effort to make the most of the opportunity thus given for exchanging experience and gathering new ideas. But, unfortunately, the value of some meetings is open to serious question.

It is significant that those sections of the country in which railway properties have been particularly backward in meeting the requirements of present-day transportation conditions are those in which an association meeting is treated most perfunctorily—in which play rather than work seems to be the first thought of those few railway delegates who attend. It is significant also that the principal executives of the various properties are largely absent from some of these meetings. The railway delegates are almost lost among manufacturers' representatives, who make up a large part of the attendance.

Surely this matter needs immediate and serious attention. The electric railway industry can ill afford so to waste time and money. If ever an industry needed the opportunity for collective thinking, the comparison of experiences and the generation of fresh enthusiasm and new ideas, it is the local transportation industry. But when the chief executive and even most of his principal assistants are absent, it is not surprising that the meetings which are held become a mere social outing, from which little if any good is derived.

Chicago Has Only Itself to Blame

CHICAGO'S transit bills went down to defeat in the closing hours of the legislative session. Long before it became apparent that this would be their fate, the measures had been so emasculated by amendment that their value to the railways and the people of Chicago was largely destroyed. The fact that the bills became enmeshed in the general program of legislation was not conducive to their progress, but this alone would not have been fatal to them. They failed because they were not allowed to rise in conception above a legislative level obsessed with the idea that the measures, by their very source, must necessarily be prompted by selfish motives, and that they were primarily the personal concern of Samuel Insull and inimical to the public interest. This, of course, was untrue, just as it would be untrue that even if they had been Mr. Insull's bills, as the saying went, that would make them measures to be suspected.

There is no one who would deny that unified and improved local transportation and rapid transit are needed and wanted by Chicago. Yet the bills providing these things died in discussion. It all seems absurd, and it was absurd, particularly as the most violent critics of the bills have in the past sharply arraigned the officers of the transportation companies, including Mr. Insull himself, for not getting together on a unification and development program. It was true that Mr. Insull had been a factor in producing the agreement on unification and on a development program. He participated in the drafting of the bills only in response to urging that he could be helpful on a job that was vital to the well-being of Chicago. The bills themselves were worked out by competent lawyers impersonally, with their base resting on principles that have been under discussion for years.

The indeterminate permit bill more particularly was subject to criticism. This principle has been under discussion in Illinois for years. The results of operation under the indeterminate permit in every state in the Union where it has been tried, as well as in Europe, were studied by a joint committee of the Illinois Legislature, and that committee approved the idea for Illinois. The consolidation bill was drawn to assure legal unification of the transportation facilities. There was nothing inherently wrong in it. It was reasonable to assume that the City Council would make no grant to a consolidated company that was not satisfactory both to the Council and to the people, who have the final say in a referendum.

Any one who considers the matter carefully must subscribe to the view that, taken as a whole, the criticism current during the discussion of the bills was not con-

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cerned with constructive comment on the fundamentals of the measures. That criticism sought rather to becloud and befog, by insinuation and innuendo, if not downright falsehood. Certainly, unification was provided for by the measures, and a development program advanced that gave every promise of working. The bills were primarily the concern of all who want better local transportation and rapid transit, and of the public officials who control the ways and means of permitting it to be provided. Not because Mr. Insull said so, but because it is a fact, responsibility for the loss of the legislation rests with opposition from agencies, journalistic and otherwise, that presumed to reflect public opinion.

An Argument That Is Irrefutable

MATERIAL of interest to the entire street railway industry is contained in an unusual advertisement which the Georgia Power Company addressed "To the Honorable William Randolph Hearst" and published recently in full-page size in the three Atlanta daily newspapers on the occasion of a visit to that city by Mr. Hearst.

A few years ago Mr. Hearst's Atlanta newspaper was actively "crusading" against the street railway, and the company knew that his presence in the city would recall vividly to the memory of the local people those days of strife and turmoil. Conditions are different now. Relations with all the newspapers are friendly and the railway enjoys the good will of its patrons to a high degree. Sizing up the situation, the company saw in the visit of Mr. Hearst an opportunity to drive home to the public the contrast between those days and the present, and did it effectively in the page advertisement. In its timeliness, in the advertising enterprise it displayed and in the remarkable candor with which it discussed the company's affairs, the advertisement itself was unusual. But its interest for the industry is in the story it contained of the company's progress and the means by which it has won the friendship of its public, including even that of the Hearst paper.

The Georgia Power Company has been doing unusual things in recent years. It has set out to win public cooperation and support by deserving it, by modernizing its equipment, by improving its service in every possible way, and it has made a success of it. In its effort to put a losing property back on its feet, the company made "First of All—Good Service" its policy, and it has demonstrated that good service is good business.

By reason of the heartening message it contains for those who may be discouraged or still in doubt as to the future of the street railway business, the power company's advertisement places the industry in debt to its framers. Let the reader judge for himself. The power company said:

> The first thing we did was to stop complaining to the public. Then we set out to give Atlanta the best street car service in the nation. We bought 203 new street cars, more new street cars than any other city Atlanta's size has got during this period. We brought our trackwork to a higher state of repair than it has ever been, installed automatic electric switches and made numerous other track improvements. We cut out interruptions in the service which were causing a great many complaints. Last year our cars traveled more than 26,000 miles per car—farther than the distance around the earth—before they had to be sent to the shops for repairs. Last year we went 348 days without an interruption to the service caused by failure of the power supply.
>
> Of course, it has taken a tremendous lot of money to make these improvements and we haven't spent it for any altruistic reasons. We have done it because we know it is good business to do it, and the fact that we have proved it's good business is a thing which will interest you most.

The ad then informed Mr. Hearst that millions of dollars had been poured into a losing property because the company knew that the first step toward putting the service back on its feet was to give citizens of Atlanta a service they would like to patronize and support. In other words, the power company never lost confidence in the soundness of that policy. It never lost confidence in the soundness of the railway industry and in the fairness of the public, even though results were slow in coming. This was included as part of its statement of policy.

Continuing, we read:

> The curve of earnings had been dropping steadily, until, in 1925, it was only slightly more than 1 per cent on an investment of about $20,000,000. But, in 1926, it started upward again. It was just a slight upturn, only a slight reduction in our annual loss, but that first upturn was all the proof we wanted that this policy pays. There should be a message of encouragement in that for other businesses, especially the other street railway companies.

This is indeed a message of encouragement for every electric railway property in the country. It is irrefutable that as ye sow, so shall ye reap. The answer of the company voices that indomitable sentiment that if entertained by the electric railway industry will forever silence the prediction that it is doomed. The Georgia company's stand in this matter reveals sporting blood of the highest order—sporting blood mixed with sound financial judgment and far-visioned engineering skill.

This kind of thinking was backed to the hilt in the Journal of June 4 by the head of one of the largest operating companies in New England. The statement in mind is that made by E. J. Dickson, vice-president of the United Electric Railways, Providence, R. I., who, after effectively presenting the rehabilitation of the company's rolling stock, said:

> Referring to the question as to results that can be attributed directly to better appearing cars with greater conveniences and comforts, I do not hesitate to state that notwithstanding all the other agencies employed to attract patronage, it is my firm conviction that had not the United Electric Railways undertaken the purchase of new cars, improved the appearance and convenience of others, and strengthened its track facilities, the gross earnings of the company would by no means be where they are today.

The gentleman from Rhode Island seconds the motion of the gentleman from Georgia. Each property in the industry must vote for itself. But in that vote lies its salvation or its doom.

Standardization of Traffic Regulations Advanced

ONCE more Herbert Hoover, Secretary of Commerce, has been instrumental in advancing the cause of standardization. This time reduction in the great variety of traffic regulations in effect in different American cities is the aim. On June 6 a meeting was held at Detroit attended by representatives of all classes of highway users as well as enforcement officials. Its object was to lay the foundation for a model for municipal traffic control. An account of the meeting appears elsewhere in this issue.

The need for some standardization of traffic regulations is obvious to any one who has traveled beyond the limits of his own home town. The old legal axiom that ignorance of the law is no excuse fails entirely to solve the problem of violation of traffic rules. As Grover Cleveland once said, "It is a condition and not a theory that confronts us." Regardless of the legal side of the question, it is a practical impossibility to expect the drivers of all vehicles to familiarize themselves in ad-

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vance with the traffic regulations in towns other than their own through which they may be driving. Better results undoubtedly can be obtained by standardizing traffic rules to the greatest possible extent. Just how far it is feasible to carry this process is the question which the conference organized at Detroit will try to answer.

Active work toward the preparation of the model code for traffic control will be carried on during the summer by six committees. These committees will consider regulations for vehicles, pedestrians, street cars, and buses, and emergency vehicles as well as traffic signs and markings, parking, street obstructions, and enforcement. Each committee will draft a section of the code pertaining to the specific subjects under its consideration. After this has been done the committee chairmen will meet and consolidate their reports. A general report will then be published in tentative form for discussion by all interested parties. The presence of a number of prominent electric railway men on the various committees insures that the interests of the industry will receive due consideration in the working out of a solution of this important problem.

The Passing of Three-Phase Traction

WITH the inauguration of service on the new single-phase electrified system of the Great Northern Railway between Skykomish, Wash., and the Cascade Tunnel the only installation of three-phase railway electrification on the American continent was abandoned. In Italy, where the three-phase system has probably reached its highest development, the engineers are turning to high-tension direct current, and it is understood there will be no further extensions of the three-phase system.

The use of three-phase alternating current for the purpose was advocated many years ago as the ideal system for hauling heavy trains. The three-phase induction motor has characteristics quite different from those of the direct-current series motor, and for haulage of heavy freight trains over heavy mountain grades it was considered ideal.

Development of the single-phase system, with the possibility of employing induction motors if desired through the use of a phase converter, or any of the various types of single-phase commutator motors, or even the use of direct-current series motors through the medium of a motor-generator set as in some of the most recent locomotives, including the ones for the Great Northern Railway, has robbed the three-phase system of its great appeal. On the other hand, direct-current equipment has been very much improved, so that now much higher contact line voltages can be used than were feasible when the three-phase system was brought out.

Contrasted with its advantages, the three-phase system has the great drawback that two trolley wires are needed. These are at widely separated potentials, so that insulation is difficult to provide and to maintain. The complication is always present, but is greater the more complicated the track layout. On this account it has never been considered practicable to go to voltages that are common with single phase. In fact, direct-current contact lines can be built with comparative ease for voltages fully as high as those used with the three-phase system.

Elimination of the three-phase system can be looked on as another milestone on the road of progress in railroad electrification. Whether it will be possible to go still further and adopt a single system, few will regret the passing of three phase with all its complications.

Banker Stresses Need for Greater Corporate Publicity

COMING months after the suggestions of Prof. William Z. Ripley regarding the need for greater publicity with respect to corporation affairs, similar suggestions made by Thomas W. Lamont of J. P. Morgan & Company have caused hardly a ripple of comment in the daily press or among business executives. It is true that Mr. Lamont's remarks lack the colorfulness of the statements made by Mr. Ripley, but they are no less pronounced on that account. He points out the benefits which have accrued to the railroads, to such companies as the United States Steel Corporation and the General Motors Corporation, to banks and to the New York Stock Exchange from the making of periodic reports to stockholders and the general public. His article, contributed to *Industrial Management,* is a plea for still further extension of the practice of corporation publicity.

One point which he makes is of great interest to the electric railways. He says that full corporate publicity has helped enormously to build up the country's transportation system, and has distinctly enhanced the credit of the railroads and their ability to borrow money more cheaply. This is indeed significant comment. In referring more particularly to the General Motors Coroporation, he asks whether it can be a mere coincidence that the company has increased its lead over most of its competitors. He probably picked this company because it is so much in the public eye, but its methods of frankness about its affairs are not very different from those of some other manufacturers and of many public utilities. He sees as a great asset to the company the 60,000 investors who own its shares, purchase its motor cars, and tell their friends of the pride they have in being stockholders of this enlightened company and of the satisfaction they derive from the possession of its product.

In his discussion of the Steel Corporation, Mr. Lamont said that there is small chance for the so-called insider to profit by purchase or sale of its shares, based on advance knowledge of unusual gains or recessions in its business, because the company's month-to-month record of unfilled orders is open for the world to see. Now that these statements have come to be taken for granted their full significance to the investor, the economist, the employee and others is often overlooked. The recital of these cases calls to mind a somewhat similar incident in which only during the last week one of the largest makers of railway and other equipment took its stockholders and the public into its confidence with respect to the affairs of the company and the prospects for the future to an extent that would have been thought almost suicidal as recently as five years ago.

Frankness about electric railway affairs has certainly made strides in recent years, but there is still a great deal that can be done. Especially is it worth while for electric railway men everywhere to take to heart the significance of Mr. Lamont's remarks to the effect that study by the organization rank and file of frequently published figures gives the staff members a new and enlightened conception of their corporate employer's part and accomplishments, and stimulates in them new ambition and determination. It certainly does no good to blink at facts. Eventually they must be faced. And one of the best ways to do it is through enlightened public opinion.

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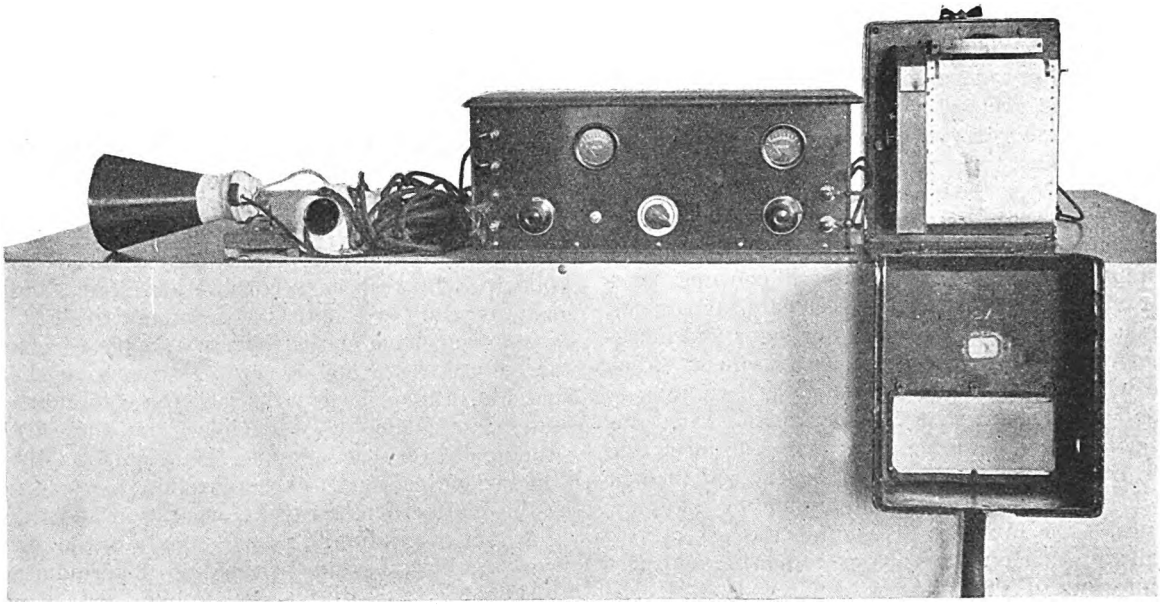


Graphic voltmeter and radio apparatus used in making n oise measurements

Measuring Noise

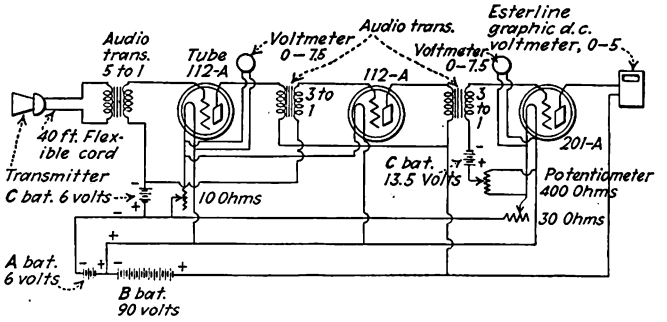
of Passing Cars

By D. D. Ewing

Professor of Electric Railway Engineering
Purdue University, Lafayette, Ind.

NOISE minimization has become an increasingly important problem in the transportation field within recent years and with the advent of radio apparatus considerable progress has been made in developing practical noise measuring equipment and technical procedure. Communication companies have been using noise measuring apparatus for a number of years in connection with their transmission studies and more recently the automotive industry has been interested in vibration and noise measurement. In the railway field the noise committee of the A.E.R.E.A. has been doing pioneer work during the last two years.

Its reports at the 1925 and 1926 conventions contain valuable analyses of the noise problem as it affects the electric railway industry. The 1926 report of this committee also described a noise measuring device of the indicating type. An interesting article by Prof. J. T. Rood and K. E. Wooldridge, published in ELECTRIC RAILWAY JOURNAL Sept. 11, 1926, page 413, describes a somewhat similar measuring instrument. This device, however, differs from that of the A.E.R.E.A. committee in that it is provided with a hand-operated graphic recording attachment. Their article also contains some valuable noise test data. It is the purpose of the present article to present a brief outline of an automatic recording device and a discussion of test data taken in connection with a recent study of railway track noise.



Electrical circuits of the amplifying and rectifying equipment

NATURE OF "NOISE" ANALYZED

For the purpose of the present discussion "noise" may be defined as disagreeable sound. The mechanics of sound have long been well understood. Any mechanical action which sets up vibrations in the air whose frequency or pitch is within the audible range produces an action on the ear mechanism which the auditory nerves interpret as sound. As the ear does not interpret vibrations of all pitches and magnitudes with equal sensitivity a distinction may be made between sound as a series of vibrations set up by some mechanical agent and sound as an interpretation of these vibrations by the human ear.

The cause of the noise, or sound, sets up vibrations in the air which radiate in all directions. These vibrations may be of many different frequencies. An ear located close to the cause may hear only the

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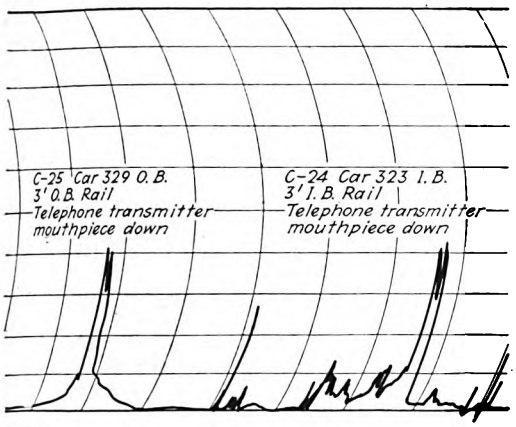

Fig. A

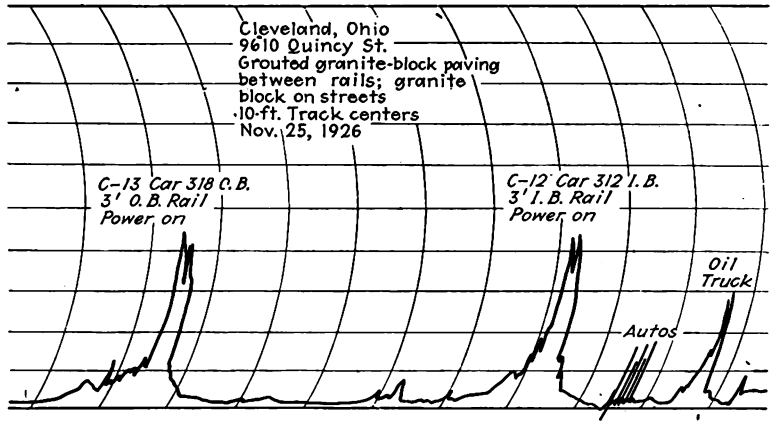

Fig. B

Fig. A.—Vibration tests at 9610 Quincy Street, Cleveland. Test C-24 was made with the transmitter 3 ft. from the gage line of one of the inbound track rails and C-25 3 ft. from an outbound track rail. All of the paving was of grouted granite block. One track was on International steel ties and the other was on wooden ties. The car speeds were about 26 m.p.h. in each case. The instrument calibration for these tests was not the same as those in which the loud speaker receiving unit was used.

Fig. B.—Typical noise graphs taken at the same location as in Fig. A. In C-12 the horn was 3 ft. from an inbound rail and in C-13 3 ft. from an outbound rail. The car speeds in each case were about 23 m.p.h.

direct vibrations, while one located at some distance may hear direct vibrations, weakened, of course, by transmission through the distance, and also reflected vibrations. It may easily happen that the amplification of the original sound by the vibrations which are reflected from neighboring surfaces may result in a sound which to the ear is of greater magnitude than that produced by the direct vibrations.

Any study of street noises should take into consideration this matter of reflected vibrations. Paving, building walls, etc., all may act as sound reflectors. An ear located at the sidewalk line will receive both the direct vibrations from the cause of the noise and the reflected vibrations which come from near-by surfaces.

The magnitude of the reflected noise will depend largely on the character of the reflecting surfaces. Smooth, hard surfaces are good reflectors, while rough, plastic surfaces are not. These differences are well illustrated by data which will be presented later in this article.

Instruments Used for Measuring Noise

In measuring the "noise" in these tests an input device in the form of a permanent magnet type radio loud speaker was used, a short megaphone being substituted for the horn. Weak alternating currents generated in the loud speaker mechanism by sound waves impinging on the diaphragm of the loud speaker were amplified by vacuum tubes, then rectified and recorded on an Esterline graphic recording direct-current voltmeter. The record strip is divided into ten major divisions and each major division into five subdivisions, or 50 subdivisions in all. As there is no established unit by which noise may be measured, the full chart width has arbitrarily been assigned the value of 100, or two units of noise per subdivision.

It is not claimed that this device interprets sound waves in the same manner as does the human ear, but it does give comparative values; thus when all is quiet the instrument reads zero, and the louder the noise as interpreted by the ear the higher will be the instrument reading.

While some percentage comparisons are given in subsequent paragraphs, it should be remembered that the calibration of the instrument does not follow a straight line law for all frequencies of vibration, being more sensitive for low volume low pitch noise than for high volume low pitch noise. For the frequencies to which the ear is most sensitive, however, the calibration more nearly follows the straight line law. In any event the deviations from straight line calibration are such as to cause the comparative percentages to be conservative rather than otherwise.

For measuring transmitted vibration, the same apparatus was used except that an ordinary telephone trans-

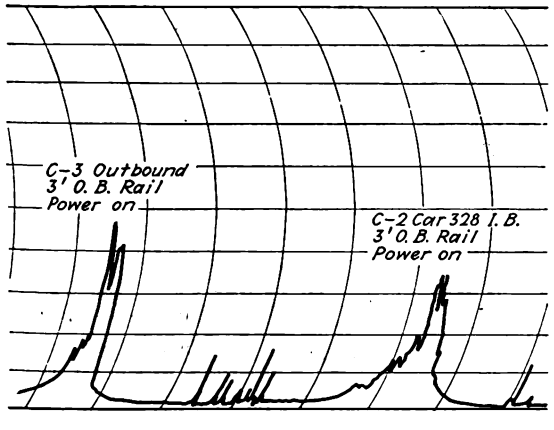

Fig. C

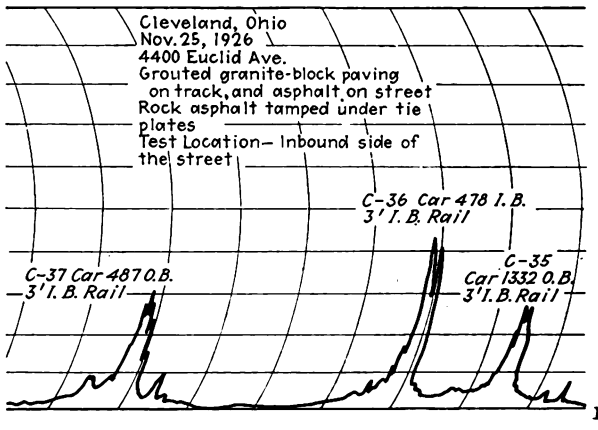

Fig. D

Fig. C.—These graphs, taken at the same location as in Fig. A and for similar cars, compare noise as measured at 3-ft. distance with that as measured across the dummy track, or 13-ft. distance. The car speeds in each instance were approximately 22 m.p.h.

Fig. D.—At 4400 Euclid Avenue, Cleveland, tests were made to compare the noise as measured at 3-ft. distance rail with that as measured across the dummy track, or at 13-ft. distance. The track centers are paved with grouted granite blocks and the street sides with asphalt. The car speeds were about 22 m.p.h.

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mitter of the solid back, carbon granule type was used as an input device, the mouthpiece being turned down to rest on the paving. By placing the transmitter on the paving with the mouthpiece directed downward most of the direct noise was excluded and the instrument response was caused by paving vibration.

Perhaps it should be pointed out that the graphs of vibration and noise do not show the individual vibrations. The line drawn by the pen of the voltmeter simply indicates a measure of the magnitude or intensity of the vibrations.

In making the measurements the amplifier and voltmeter equipment were set up in an automobile, the automobile battery being used as a source of energy for the vacuum tube filaments. With the automobile parked at the street curb, a 40-ft. length of flexible cord permitted the loud speaker unit to be placed either near the track or at some other point on the street as might be desired.

Owing to the greater noise produced by the car trucks, peaks were often produced in the noise graphs. By knowing the chart speed, which was 1 in. in nine seconds, and the distance between car trucks a fairly accurate determination of car speed was possible in many instances.

TABLE II—COMPARISON OF NOISE AS MEASURED AT 13 FT. (3 FT PLUS DISTANCE BETWEEN TRACK CENTERS) COMPARED WITH THAT AT 3 FT.

Town	Paving: Track	Paving: Street	Noise in Per Cent of that at 3 Ft.
Cleveland	Granite block	Granite block	76
Cleveland	Granite block	Asphalt	70
Cleveland	*Open track		19
Schenectady	Granite block	Asphalt	67
Harrisburg	Asphalt	Asphalt	56
Harrisburg	Concrete	Concrete	92

*NOTE—The distance between track centers here was about 15 ft. instead of 10 ft.

during the latter part of last November. Noise readings were taken at ten different locations and a total of 240 graphs were recorded. The cars were operating on their regular schedules and all conditions were those of normal operations.

It is not possible, of course, to present all of the graphs, but a few are reproduced here, together with explanatory notes relating to them.

The noise readings at 9610 Quincy Street, Cleveland, are probably higher than they would have been had the street surface and rails been free from loose dirt and sand. At this location wooden ties are under one track and International steel ties under the other. The graphs of Figs. A and B indicate that tie type does not appreciably affect the volume of noise caused by dry car operation. This conclusion was verified at several other locations when tests were made.

The assumption is often made that open track is quiet track, but it appears from Fig. E that this assumption needs some modification. To an ear placed close to the rails it appears that this type of track is as noisy as any other. However, the graph also shows that at a short distance away the noise is small in volume. This is because of the excellent deadening qualities of dirt and ballast. The apparent quietness results from the low reflection coefficients and high absorptive values of dirt and gravel. Also, it may be noted that the wheel im-

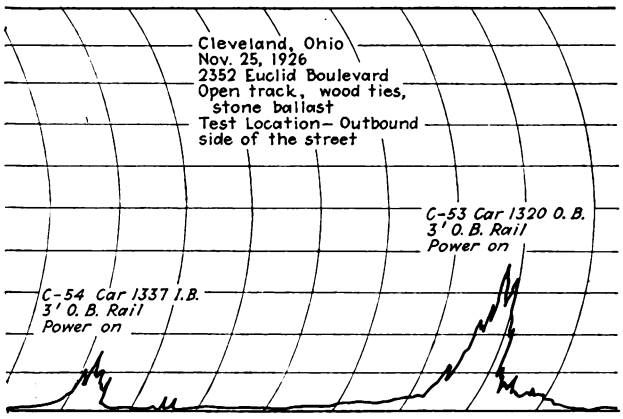

Fig. E.—These graphs, taken on open track in Cleveland, are of especial interest. The horn was located 3 ft. from the shoulder rail of the outbound track for both tests. The track centers were about 15 ft. apart. The car speed for C-53 was about 16 m.p.h.

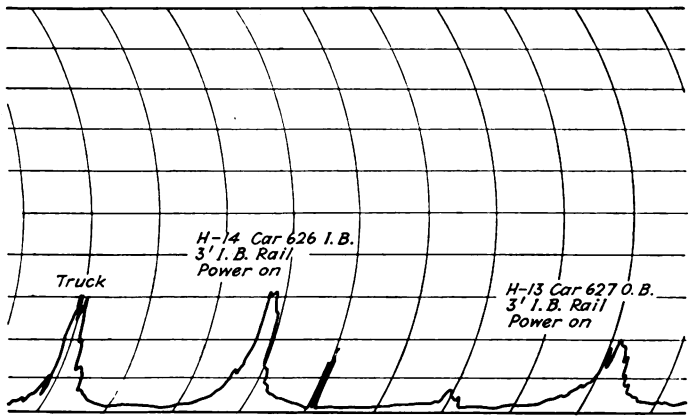

Fig. F.—The graphs H-13 and H-14 were taken on Second Street, in Harrisburg. The paving is of asphalt with wood block liners along the rails. The horn was located 3 ft. from the inbound shoulder rail and the car speed for H-14 was about 15 m.p.h.

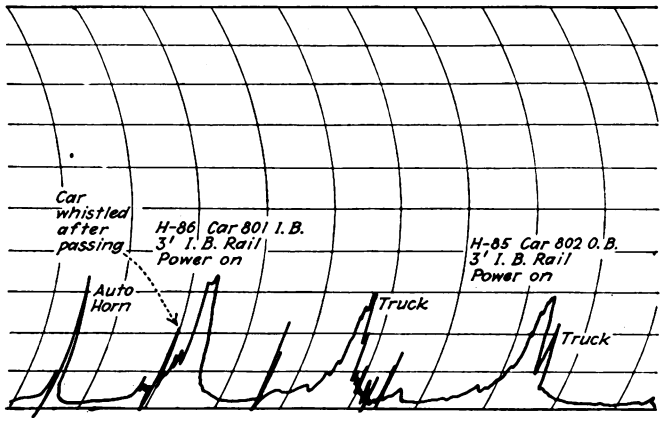

Fig. G.—The graphs on this chart were taken on Derry Street, Harrisburg, with the horn located 3 ft. from the inbound shoulder rail. The speed for H-86 was 18 m.p.h. The auto trucks were as noisy as the cars. The paving is of concrete and the street surface is smooth.

Noise Test Made on Operating Track

Tests from which the following data are abstracted were made in Cleveland, Schenectady and Harrisburg

TABLE I—COMPARISON OF NOISE MEASUREMENTS. HORN 3 FT. FROM RAIL

Town	Paving: Track	Paving: Street	No. Tests	Average Speed	Average Noise
Cleveland	Granite block	Granite block	13	23	39.5
Cleveland	Granite block	Asphalt	9	22	33
Cleveland	Open track	Open track	4	18	31
Schenectady	Granite block	Asphalt	24	17	28.5
Harrisburg	Asphalt	Asphalt	19	14	27
Harrisburg	Concrete	Concrete	7	18	31

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pact blows at the joints cause noises not heard on properly maintained paved track and that in general the noise graphs for the open track show a longer duration of noise because of the transmission of the impact vibrations by the rails.

The noise incident to automobiles and other vehicles is clearly indicated on several of the graphs. Irregularities in the graph just before or just after the passage of a street car are records of street noises resulting from causes other than car operation.

Tabulations of the analyses of a number of the noise graphs are shown in Tables I and II. The "average noise" is in each case the mean for number of tests made under similar conditions of car speed and traffic.

Plastic Paving Deadens Noise

In general, plastic paving surfaces resulted in less noise than hard surfaces and smooth paving was noisier than rough paving, street car noise alone being considered. Table II shows clearly the effect of type of paving on the volume of noise heard at a short distance. The granite block paving was quite as "hard" as the concrete, but because of its roughness a much poorer reflector.

A few tests made with the horn placed 25.6 ft. from the gage line of the nearest rail showed that for asphalt paving the noise was 29 per cent of that at the 3-ft. distance and for smooth-surfaced concrete 68 per cent, the noise at the 3-ft. distance being about the same.

As might be expected, the volume of apparent noise is greatly affected by car speed. Test data for car speeds below 7 or 8 m.p.h. show that for the low speeds the observed noise was very low. There seems to be a critical speed for a given type of car above which the noise increases rapidly with an increase in speed.

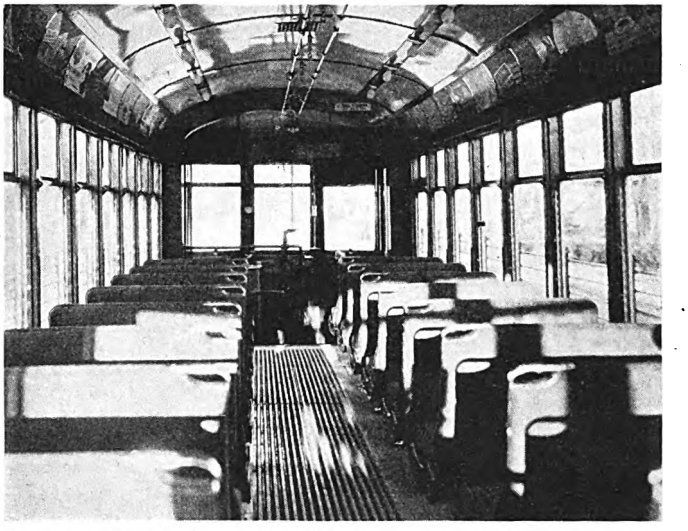
A careful study of the test data and observations made on car operation during the test leads to the conclusion that where the track area is paved and the track and paving well maintained but little noise emanates from the rails themselves. The condition of the rails as to smoothness and freedom from sand and pebbles has an important bearing on the noise caused by the car. The street surfacing plays a major part in transmitting and reflecting the noise emitted by the car and is therefore an important secondary agent.

Southern Company Prefers New Cars

Six steel cars were built by the Southern Public Utilities Company in preference to remodeling six steel one-man, two-man cars

By W. B. Osborne
Master Mechanic Southern Public Utilities Company, Charlotte, N. C.

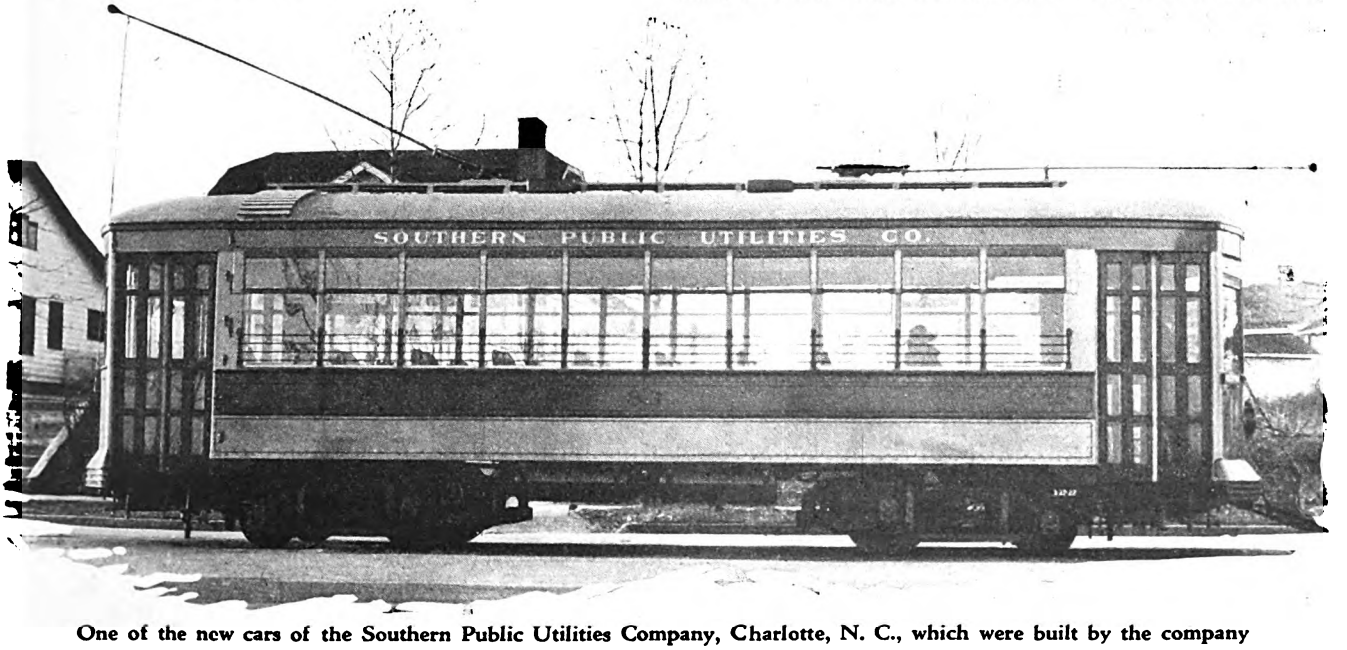
REALIZATION of the importance of attractive and comfortable cars as a medium for increasing the riding habit led us early in 1925 to decide on a program of car reconstruction. We had not proceeded very far with the rebuilding of the first car when it was found that



The new Charlotte cars are roomy and airy. They are arranged for operation by one man or two men

the cost of the remodeling would be prohibitive. It was then decided to build entirely new steel-frame cars and to scrap the old.

We have completed three 33,000-lb. double-truck, one-man, two-man steel-framed cars in our Charlotte shop



One of the new cars of the Southern Public Utilities Company, Charlotte, N. C., which were built by the company

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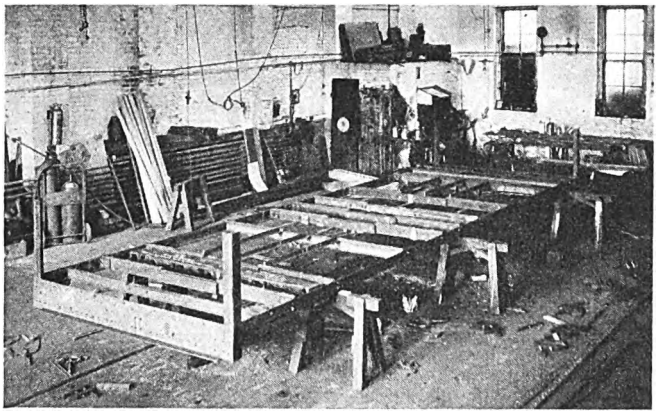
DETAILS OF EQUIPMENT FOR THE NEW CARS OF THE SOUTHERN PUBLIC UTILITIES COMPANY

Number of units	6
Type	One-man, two-man, motor; passenger, city, double-end, double-truck
Seating capacity	40
Weights:	
Car body	20,000 lb.
Trucks	10,000 lb.
Equipment	3,000 lb.
Total	33,000 lb.
Bolster centers	18 ft. 10 in.
Length over all	38 ft. 3 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	11 ft. 6 in.
Body	All steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Heat treated
Bumpers	Hedley anti-climber
Car signal system	Faraday
Car trimmings	Dayton
Control	K-36
Curtain fixtures	Morton Manufacturing Company
Curtain material	Pantasote
Destination signs	Keystone
Door mechanism	Manual
Doors	Folding
Finish	Pratt & Lambert enamel
Floor covering	Wood strips
Gears and pinions	Tool Steel
Hand brakes	National
Heaters	Consolidated
Headlights	Ohio Brass
Headlining	Agasote
Interior trim	Cherry
Journal bearings	Plain, MCB type
Journal boxes	MCB type
Lightning arresters	G. E. electrolytic
Metal sash	Curtain Supply Company
Motors	Two Westinghouse 532-B, outside hung
Registers	Ohmer
Roof material	Tuco canvas
Safety car devices	Safety Car Devices Company
Sanders	Ohio Brass
Sash fixtures	Curtain Supply Company
Seats	St. Louis
Seating material	Kemi-suede
Slack adjusters	American automatic
Steps	Folding
Step treads	Irving Safkar
Trolley retrievers	Ohio Brass
Trolley base	Ohio Brass
Trucks	Brill 39 E-1
Ventilators	Utility
Wheels, type	Standard, diameter 34 in.
Wheelguards	H-B lifeguard

and the fourth is well under way. The tentative program calls for the building of six or more of these cars to replace wooden cars which have served their usefulness.

The sills of the new cars are made of 4½-in. x 3-in. x ⅜-in. angle and reinforced by 4-in. channel cross-members, spaced 36 in. apart and hot-riveted to the side sills through clip angles. Steel tees are used for the trap-door framing. Carlins made from 2-in. x 1½-in. x ¼-in. steel tees and installed in one piece from side sill to side sill form the contour of the roof.

The side of the car is covered with No. 10 gage sheet steel plates 32 in. wide, whereas the letterboards are No.



Framing of one of the Charlotte cars laid out in the shop preparatory to erecting the posts

16 gage sheet steel. These plates are shaped to provide waterproof joints.

The 3-in. x 3-in. x ¼-in. window sills are copper flushed at all joints and soldered to the window posts to prevent the entrance of water. Flooring is made from ⅞-in. x 3¼-in. best grade oak and a 24-in. center wood matting is installed throughout length of the floor. Light cherry interior finish harmonizes with the medium buff colored headlining and the dark slate colored floor.

Sixteen reversible cross seats and four longitudinal seats upholstered in chocolate colored Kemi-suede provide seating facilities for 40 passengers. The cushions are designed with special springs for the comfort of the passengers. The car is illuminated by fourteen main lamps, one door-exit lamp, two platform lamps, two sign lamps and two headlights. The door-exit lamp and the two rear platform lamps are arranged to burn at the same time that the headlight is burning.

Brill 39 E-1 trucks with double springs improve the riding quality, whether or not the car is fully loaded. Sandboxes installed underneath the platform are made waterproof by placing a 4-in. steel ring flush with the flooring and covering with an aluminum ball cover.

Machines Constructed by Welding

WHAT promises to be a revolutionary step in the manufacture of electric machinery is the adoption of electric arc welding for the fabrication of many types of machines by the General Electric Company. This practice, as outlined in an article by R. H. Rogers in the July issue of the *General Electric Review,* results in many decided advantages over the use of castings.

Among the uses of electric arc welding in the General Electric shops are manufacture of magnet frames and armature spiders for direct-current motors and generators and synchronous converters; stator frames and rotor spiders for alternating-current machines; bases, bearing pedestals, guards and air shields or deflectors for various types of machines, etc. In addition to these electric machines, transformer tanks, oil circuit breaker tanks, switch mechanisms and control devices, electric refrigerators, mercury boilers, centrifugal compressors and many other types of equipment are constructed to a greater or less extent by the use of electric arc welding.

For castings it is necessary to maintain pattern shops, pattern storage, core shops and ovens, and foundries, together with space and equipment for preparing the castings for the machine shop. Defects developing after a casting has been poured, cooled and annealed result often in long delays in the completion of a given machine. Other disadvantages eliminated by the use of welding include loss of metal in the casting process, use of excessively heavy parts for very light duty, high machining costs, etc.

Electrically arc welded machines and parts, in addition, have the same strength as castings but are considerably lighter in weight; designs are not restricted to existing patterns; less copper is needed to produce the same density of field flux in rotating machines; greater freedom in ventilation is provided, and smaller revolving weights and diameters are obtainable.

Each large electrical unit is usually built "to order" and has to be designed, to a large extent, specially throughout. When castings are used, this necessitates the preparation of special drawings, patterns and often pits in the foundry. Such work is much simplified with electric arc welding because of the freedom with which standard slabs, plates, sheets and bars can be shaped, and the speed and ease with which parts, including reinforcements and precision members, can be arc welded together. Work can be started on the construction of an arc-welded machine as soon as the drawings are made for it.

The General Electric Company uses both hand and automatic welding in this work. The welding is, however, done largely by automatic machines which impart the desired motion to the electrode.

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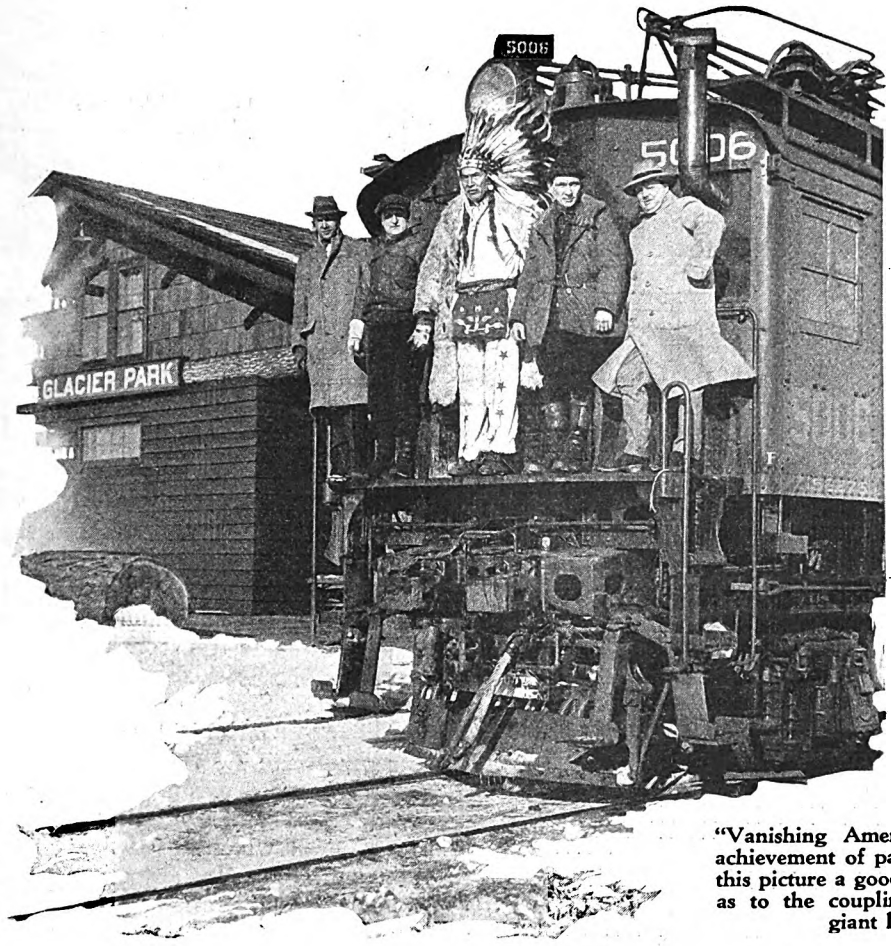

"Vanishing American" greets another achievement of paleface brother. From this picture a good idea may be obtained as to the coupling mechanism of the giant locomotives

Electric

Colossus of Rails

Now Hauling Great Northern Trains

Two 4,330-hp. motor-generator locomotives at Skykomish, Wash., inaugurate service on new electrified trackage in Cascades. Can haul 200-car train of 70-ton cars

WITH a triumphant tour rivaling that of some royal personage, two of the four giant electric locomotives ordered by the Great Northern Railway in May, 1925, as part of its $40,000,000 Cascade Mountain electrification program have been delivered. They are now hauling the Oriental Limited and freight trains from Skykomish, Wash., 85 miles from the coast, to the east portal of Cascade Tunnel, a distance of 26 miles, and on grades of 2.2. per cent.

The induction into service of these units marks not only the retirement of the three-phase system installed in the tunnel in 1909, but the completion of the 21.4 miles of electrification work in the State of Washington from Tye, at the western end of the tunnel, to Skykomish. Incidentally, this work is the first step of the Great Northern in reducing the enormous operating difficulties presented by its crossing of the Great Divide. The remainder of the project will include the construction of a tunnel 7¾ miles long, 500 ft. below the present tunnel, and the electrification of 96 miles of main line from Gold Bar to Wenatchee, Wash.

Before discussing the project in detail, however, it is of major interest to examine the general specifications for the locomotives, which were recently issued by the joint builders, Baldwin Locomotive Works and Westinghouse Electric & Manufacturing Company. They are given in the accompanying table. Reduced to a simple statement, these locomotives are capable of starting a 200-car train of 70-ton cars.

Technically, the locomotives are a development of the design first used in 1925 at the Ford plant, Detroit, when the Detroit & Ironton Railroad was making an experi-

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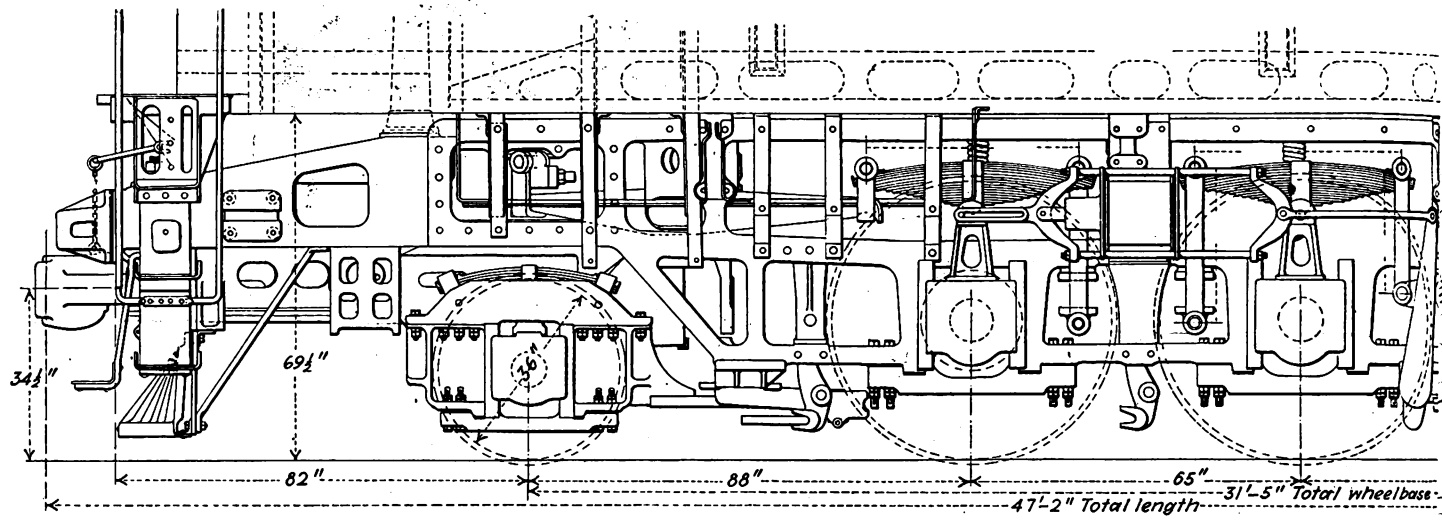


Trucks and brake rigging of the Great Northern's

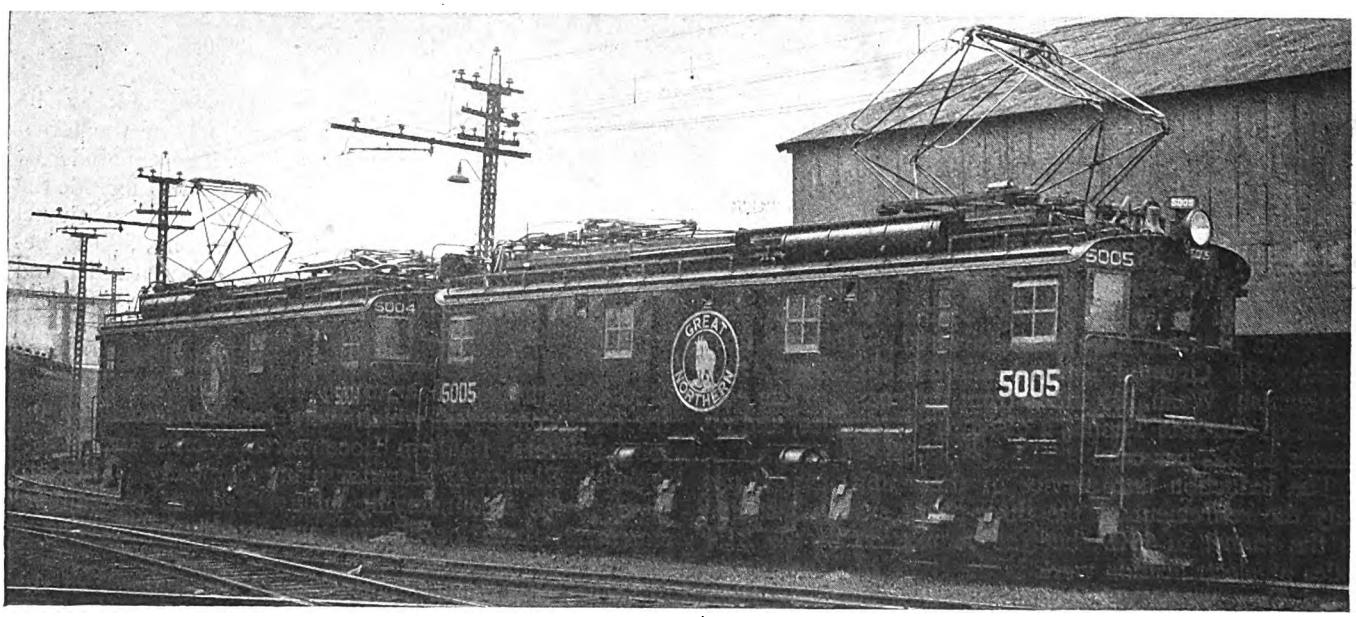
mental electrification of its line. Built to operate on 11,000-volt, single-phase, 25-cycle alternating current, they convert this current by means of a transformer and a motor-generator set into direct current for the traction motors. This means high-voltage transmission to the locomotives with minimum copper loss and power loss, unattended static transformer stations along the railway line, light overhead construction, plus the advantages of direct-current traction motors, and practically unlimited flexibility of control in operation. It also means a system of regenerative braking effective at all speeds, by which the heavy trains can be brought down the steep grades without the use of air brakes, the descending train generating power which is fed back into the trolley and into the power system for any other trains or for general use, while at the same time controlling the speed of the train.

In order to negotiate curves the locomotives are divided into two cabs, which are identical mechanically and electrically. Each cab is self-contained and can be operated alone. It is understood that similar construction will obtain for the other two units, the electrical equipment for which is being turned out by the General Electric Company.

As announced in the JOURNAL for Nov. 20, 1926, the first engine of the Baldwin-Westinghouse order was inspected at Pittsburgh Nov. 16 last in the presence of railway officials and engineering experts for the builders.

SPECIFICATIONS OF GREAT NORTHERN RAILWAY ELECTRIC LOCOMOTIVES

Total weight	715,000 lb.
Classification of wheels	1-D-1 + 1-D-1
Weight on drivers	549,600 lb.
Number of driving axles	8
Number of idle axles	4
Capacity at one hour rating	4,330 hp.
Starting tractive effort, 25 per cent adhesion	137,400 lb.
Maximum starting tractive effort, 33½ per cent adhesion, limited by adhesion	183,200 lb.
Tractive effort—hourly rating	112,500 lb.
Speed—hourly rating	14.4 m.p.h.
Tractive effort—continuous rating	88,500 lb.
Speed—continuous rating	15.5 m.p.h.
Maximum speed	37.5 m.p.h.
Track gage	4 ft. 8½ in.
Total wheelbase	78 ft. 6 in.
Rigid wheelbase	16 ft. 9 in.
Length over all (between faces of buffers)	94 ft. 4 in.
Width over all	11 ft. 0 in.
Height from rail to locked position of pantograph	15 ft. 10 in.
Diameter of driving wheels	56 in.
Voltage and type of conductor	11,000-volt, one-phase, 25-cycle, overhead
Number and type of motors	Eight Westinghouse 356-A
Method of drive	Double flexible gear
Gear ratio	18:91
Type of control	Westinghouse HBFR



Ready for business—one of the powerful 4,330-hp. motor-generator locomotives recently delivered to the Great Northern Railway by the Baldwin Locomotive Works and Westinghouse Electric & Manufacturing Company. Each cab is identical electrically and mechanically, and coupled together they can haul a 200-car train of 70-ton cars

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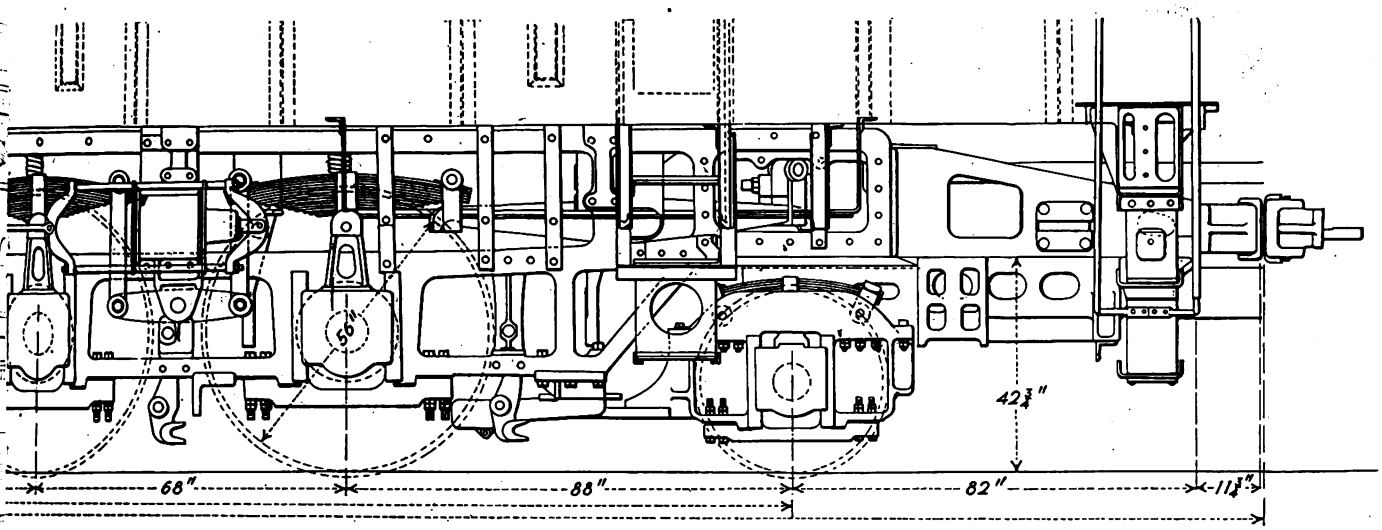


new 4,330-hp. units for the Skykomish electrification

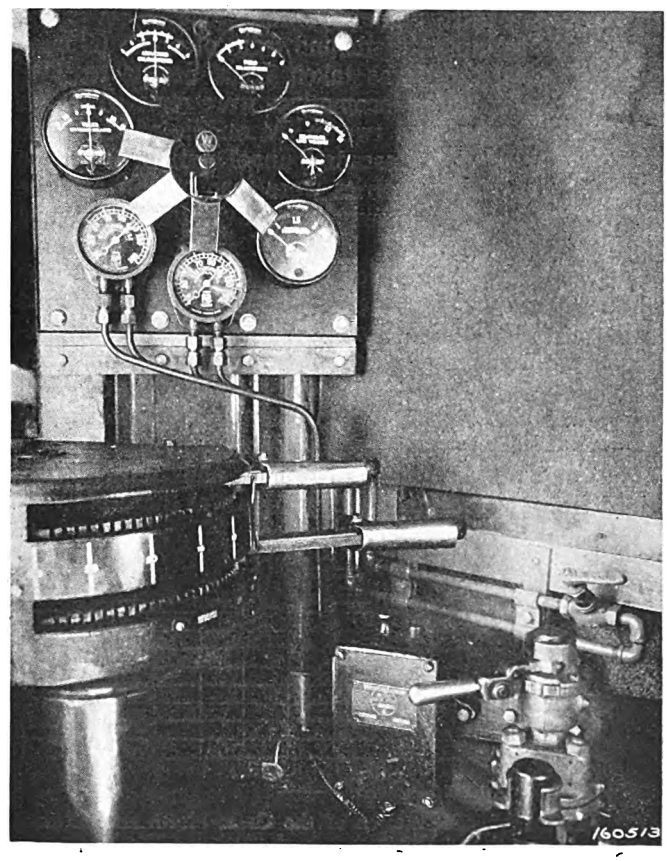
Following this it was decided to send the locomotive, known officially as Nos. 5006 and 5007 (each cab was given a number for maintenance purposes), on a tour of the principal cities of the West before inaugurating the new service at Skykomish. Accordingly this unit, with T. E. McGettigan of the Westinghouse test engineering forces acting as pilot, left Pittsburgh Jan. 2. Its itinerary included Chicago, St. Paul, Minneapolis, Glazier Park, Seattle, Spokane, Tacoma, Portland and Everett, it finally being placed in service at Skykomish about Feb. 5. At each stopping place this "Colossus of the Rails" was exhibited in such a manner that the public was able to view the giant machines from every angle. From the souvenir publicity album prepared as a record of the trip and exhibited in the New York office of the Westinghouse company it is estimated that 65,000 persons saw the locomotive during the tour. As far as single crowd records are concerned, Spokane and Portland appear to have been close rivals, it being understood that in each city nearly 5,000 persons visited the exhibits. At Seattle the interest was so marked that not only did the city's woman Mayor, Bertha K. Landes, officially inspect the locomotive but hundreds of citizens waited all day in the rain for a peek at the electrical monster. As will be seen in the accompanying illustrations, the "vanishing Americans" also bowed to another "iron horse" of the paleface, which daily will thunder past their tepees, reminding them of the lordly herds of bison that are no more.

But to appreciate what work these electric locomotives will be called upon to perform it is necessary to examine the operating conditions in the Cascade territory which for years have confronted the Great Northern.

While this carrier, which extends from St. Paul, Minn., to coast cities of Washington State, has the lowest ruling grade to the Pacific Coast of any of the western railroads, it is confronted in the Cascades with severe grades, which, to make matters worse, are against the load movement. Here, to gain the summit of the range, the single track not only makes a precipitous ascent, but a very circuitous alignment on the western slope is necessary in order to make railroad operation possible. In addition, there are several tunnels on the western slope, the longest of which is Cascade Tunnel, located at the summit.

Between Seattle and Skykomish the profile shows that the grades are not unduly heavy nor are the curvatures excessive, heavy grades and curves being confined to that section on the west slope of the Cascade Mountains between Skykomish and Cascade Tunnel, and on the east slope between this tunnel and Leavenworth, Wash. On the west slope a continuous grade of 2.2 per cent is encountered from Skykomish to Tye, a distance of 21.4 miles, with curvatures up to 10 deg., and from Tye to the summit of the range through Cascade Tunnel the grade is 1.7 per cent.

Facing these conditions, in 1909 the original electrification was installed through Cascade Tunnel mainly for the purpose of eliminating gas and smoke so as to expedite train movement. It extended from Tye at the west portal to Cascade Tunnel station at the eastern portal, and comprised 4 miles of main line track and 4



Engineer's compartment, showing control mechanism

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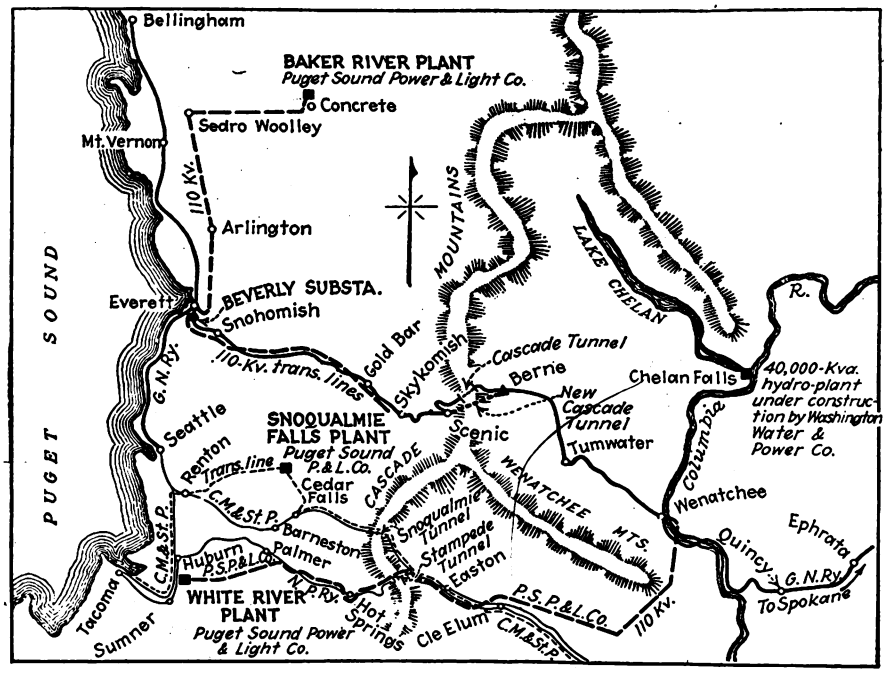


The Everett-Wenatchee section of the Great Northern Railway, showing location of new tunnel and power lines that will furnish energy for the electrification

miles of yard trackage. The 6,600-volt, a.c., three-phase, 25-cycle system was used with a double overhead catenary trolley.

When the original installation was made it was necessary to erect a hydro-electric generating station at Tumwater on the Wenatchee River, 30 miles from the tunnel. Power produced here by two 2,000-kw., three-phase, 25-cycle, 6,600-volt units was transmitted to the substation at Cascade Tunnel at 33,000 volts. Water was brought to the plant, which operated under a head of 176 ft., in an 8½-ft. flume, 2½ miles long.

With this set-up an eastbound train of about 60 cars, weighing 2,500 tons, was taken from Seattle to Tye. There the steam helper locomotives were replaced by the electrics, two ahead and two in the middle of the train. From Tye the run to Cascade Tunnel station was made in 22 minutes. The electrics were then cut off and the train reassembled with steam locomotives for the 53-mile trip to Wenatchee.

Such were the Great Northern's operating conditions until, realizing that the original electrification had served its purpose and that it was being operated at an extremely high cost, the management, after a careful study of the situation decided that considerable improvement in schedules and a reduction in operating expenses could be effected by a new system of electrification.

The experience, both favorable and unfavorable, gained from the original electrification was therefore very helpful in selecting the new 11,000-volt, 25-cycle, single-phase system.

Some of the reasons advanced by the company for the use of 25 cycles on the new system as compared with the standard commercial frequency of 60 cycles are:

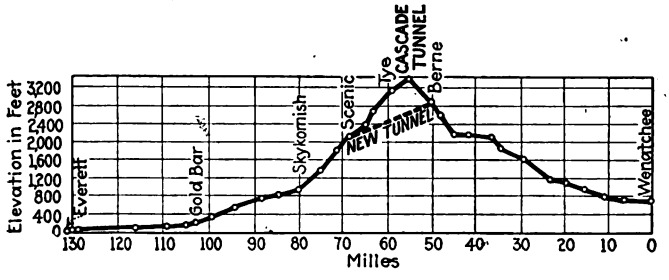
1. Facilitates use of full capacity of 6,000-kw., 25-cycle output of Tumwater plant because of liberal design of three-phase machines, which make possible full nameplate capacity at single phase.
2. Some kind of rotating apparatus would have been required to convert single-phase railway load into balanced three-phase load on the power system supplying the energy.
3. Twenty-five cycles is standard for railway transformers and much other equipment which has been developed.
4. Less interference with communication circuits at 25 cycles.
5. Regulation of 25-cycle system is considerably better on fluctuating loads, and losses are less than on 60-cycle system.
6. Because of higher impedance of rails copper ground return would have been required for 60 cycles.

In addition, it is pointed out that with the new electrification it will be possible always to operate at practically an unlimited number of speeds up to the continuous rating of a locomotive. The method of accelerating a train by means of voltage control of the motor reduces both starting losses and power demand. By using a synchronous motor to drive the conversion set on the locomotive power-factor correction is obtained. For regenerative braking it is possible to regenerate at all speeds and with the varied train weights within the established range of the locomotive to practically standstill.

The Great Northern has contracted with the Puget Sound Power & Light Company to supply all power for the electrification. The Tumwater generating plant will be operated by the power company and tied in with its system through a 44-kv. railway transmission line at present and later possibly by its 110-kv. transmission line going via another route over the mountains to Wenatchee.

The present project involves the construction of a 110-kv., three-phase, 60-cycle transmission line from the Beverly substation of the power company, near Everett, Wash., to Skykomish; the erection of two new outdoor substations at Scenic and Cascade, respectively; a frequency changer set installed in the Skykomish station, where connection is made with the 110-kv. transmission line of the power company, and the erection of the 44-kv. railway transmission line from Skykomish to Tumwater.

The two 44-kv. railway transmission lines, the trolley construction and signal line are all being carried on single poles along the right-of-way. The trolley contact line is No. 4/0 cadmium bronze supported by inclined catenary type of construction.



Profile of heavy grade section of the Great Northern Railway between Everett and Wenatchee in the State of Washington. New tunnel shown by dotted line will be 7¾ miles long and 500 ft. below the level of the present tunnel

Signal Interference Being Studied

Careful consideration has been given to possible interference to signal and communication lines due to the single-phase system. The d.c. signal system will be changed to a.c. 60 cycles with 6,600-volt transmission. Telegraph and telephone lines will undergo general revamping, using necessary cables or removing them from the right-of-way entirely. Local telephone lines hereto-

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fore adjacent to the right-of-way will be removed to a convenient distance to avoid inductive troubles.

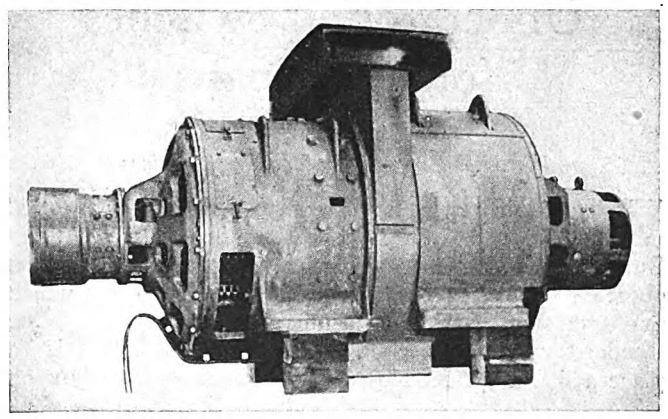
Metering presented some interesting problems to the power company owing to the condition of the contract which calls for the simultaneous measurement of demand at two widely separated points. In addition, it is necessary to take into account power fed back into the power company's system by the Tumwater plant and by the electric locomotives when regenerating. Power will be measured by two three-phase ratchet meters at each point and demands will be measured by graphic meters to obtain simultaneous records at the two points.

According to the contract, billing for power will be made on the basis of the average of the three highest five-minute demands during the month. In the event of power failure any peaks occurring during the first fifteen minutes after service is restored are to be ignored. As all power taken by the railway company from the 110-kv. line of the power company will first pass through the frequency changers, driven by synchronous motors, it will be possible to maintain unity power factor or even a leading power factor if desired.

Simultaneous with the rehabilitation and extension of the original electric section a new tunnel through the Cascade Mountains is being driven, and when completed this will be the longest railway tunnel in America, 7¾ miles. The present line crosses the divide at an elevation of 3,385 ft. above sea level. As mentioned elsewhere, it has sharp grades and curves, numerous snowsheds and several tunnels, one of which is the Cascade, 13,873 ft. long. On account of heavy snowfall, which reaches a maximum of 410 in. at one point and 670 in. at the Cascade Tunnel each season, it is difficult and expensive to keep the line open for operation. Increasing importance of a thoroughly dependable line, the necessity for additional snowsheds on the present route and the heavy repairs on the existing snowsheds brought expenditures to a point where a new line on a lower level would show a substantial gain.

The new tunnel line will shorten the right-of-way more than 7½ miles, eliminate nearly six complete circles of curvature and will escape most of the severe snow trouble. The grade will be the same as the present tunnel, but the elevation will be 500 ft. lower. Electric power is being used throughout in its construction, which it is expected will be completed in about two years.

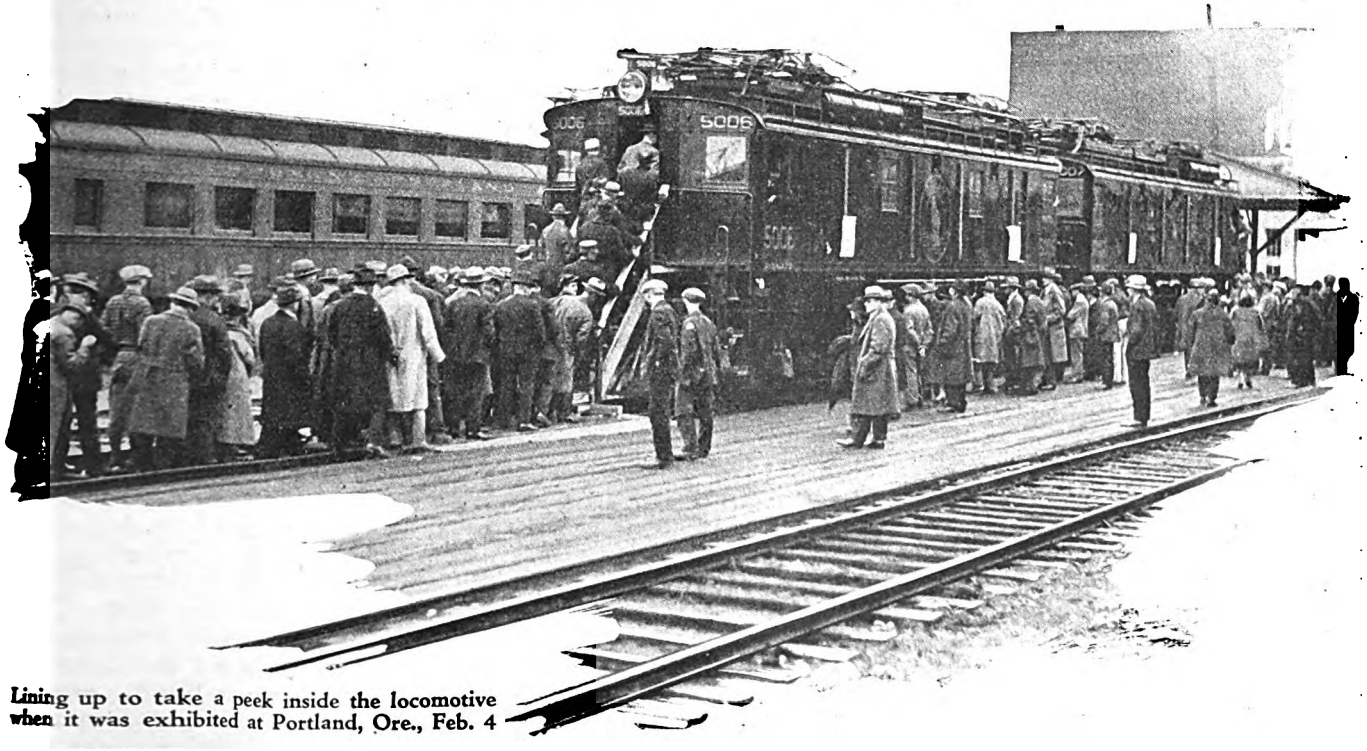
As far as the line on the eastern slope is concerned, the Great Northern is not especially interested in electrifying it at this time, as certain changes in alignment, coupled with other reasons, make it impractical.



Motor-generator set consisting of a.c. synchronous motor, d.c. generator and two exciters for the electric colossus

Three Out of Every Four Hold Stock

MORE than 10,500 of the approximately regular 18,000 employees of Public Service companies subscribed for 18,511 shares of 6 per cent cumulative preferred stock of Public Service Corporation of New Jersey in the 25th anniversary offer to employees which opened on May 20 and closed recently. Taking into consideration the many employees who have subscribed for previous issues of Public Service stock, it is estimated that three out of every four employees are stockholders.



Lining up to take a peek inside the locomotive when it was exhibited at Portland, Ore., Feb. 4

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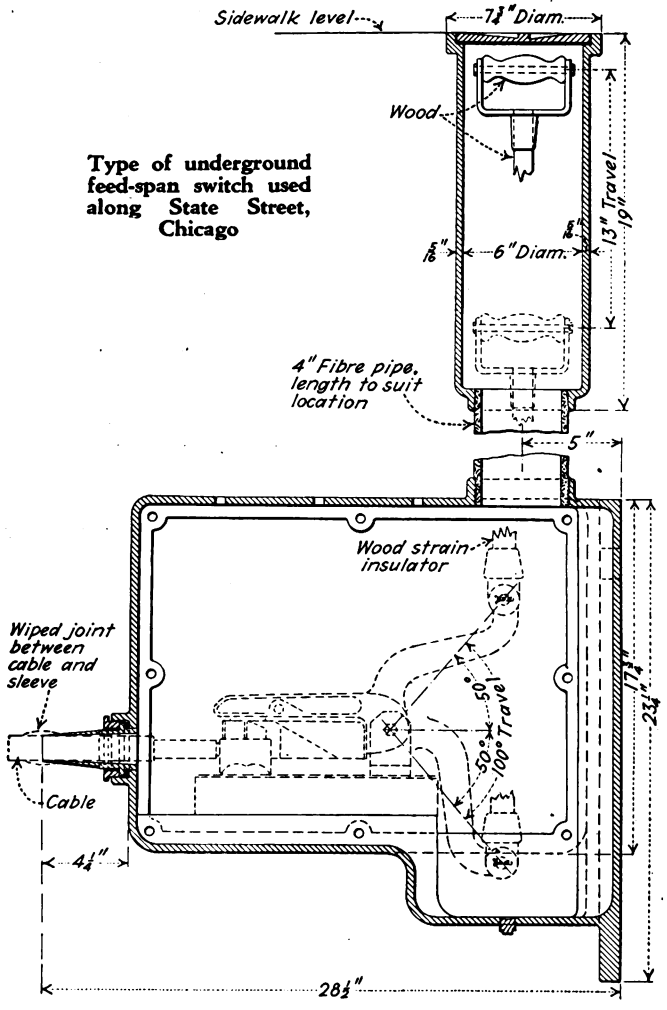
Underground Switches for Feed Spans

By A. J. Klatte
Electrical Engineer Chicago Surface Lines

WHEN an ornamental lighting system was installed on State Street, Chicago, between Lake and Van Buren Streets, the local business men's organization objected to the presence of anything on the poles which might detract from their ornamental appearance. The standard practice of the Chicago Surface Lines is to place a 400-amp. feed-span switch in a wooden box on every fourth pole 12 ft. above the sidewalk. To overcome the objection of the business men's association an underground switch was designed and installed along State Street.



Type of underground feed-span switch used along State Street, Chicago

Basements in practically all of the stores run out to the curb line, the space under the sidewalk being used for storage, etc. The switch boxes are mounted on the retaining wall or hung from the ceiling in these basements. To conceal the cables as much as possible they are run underground from the manhole through the retaining wall to the switch box. From the switch box they pass upward through the trolley pole and out the top, then through the bottom of the urn of the ornamental casing and thus to the feed span.

A vertical tube was installed through the sidewalk and connected to the box by a 4-in. fiber conduit. The conduit insulates the box from the tube to protect pedestrians from shock if for any reason the box should become energized. The top of the tube has a bronze screw cover which rests on a rubber gasket. Inside the tube is a wooden handle connected to a treated wood rod, which is in turn connected to the switch arm. To open the switch the cover is screwed off the tube and the handle pushed down. To close the switch the handle is pulled upward. The arm on the switch travels through an arc of 100 deg. With this arrangement it is necessary to enter the basement only to make repairs, the switch being opened and closed from the sidewalk.

The box is lined with ¼-in. asbestos board for protection in case the switch is pulled under a heavy load. Cables entering the box are 500,000-circ.mil lead-covered, rubber-insulated, with a wiped joint between the cable and the nipple, which has been made waterproof. While the basements are free from moisture, the boxes also have been made waterproof. In the bottom of the box a sump is provided with a pipe plug for draining if water should enter the tube from the sidewalk. To make the mechanism readily accessible for repairs the sides of the box are removable, with rubber gaskets around the flanges to keep out moisture.

Outing and Recreation Bureau—New Service Adjunct

FOUR high-speed, electrically operated railroads and other public service companies serving the Greater Chicago area have completed plans for the establishment of a new service to the residents of this territory under the auspices of the Outing and Recreation Bureau. Information of the most detailed character concerning any resort or city served by the associated railroads sponsoring and maintaining the bureau will be supplied on request. This initial function will be augmented in the near future by a home-finding bureau, which will supply authentic information concerning values, locations and other details of homes in the Chicago district.

Following an exhaustive survey a mass of informatory data has been collected on fishing, bathing, boating, horseback riding, hiking, picnicking and sightseeing in some of the most ideal places. The bureau will give rates, train times and even sell tickets for any party, large or small.

A new service expected to prove widely popular has been established by agents of the bureau to the widely known sand dunes of this territory. By calling the bureau arrangements can be made for long or short hikes through this marvelous natural paradise under the direction of guides long acquainted with the region. At small cost the entire trip will be planned by bureau agents, including meals, guide service and fares.

One of the many attractive features of the bureau's special tours which have been mapped out is their low cost. Attractive literature, including leaflets of resort information, has been gathered by the bureau for distribution. The bureau is located at 72 West Adams Street, Chicago. With its development it is planned to establish branches in other sections of Chicago, as well as in important cities served by the railroads. The companies other than the South Shore Line which have had a part in its organization are: Chicago, North Shore & Milwaukee Railroad, Chicago Rapid Transit Company, Chicago, Aurora & Elgin Railroad, Shore Line Motor Coach Company, Midland Utilities Company, Commonwealth Edison Company, Peoples Gas Light & Coke Company, Public Service Company of Northern Illinois and the Utility Securities Company.

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Rejuvenating the

Overhead Contact Line

By L. W. Birch
Line Material Engineer Ohio Brass Company

Many miles of interurban trolley may be rendered suitable for higher speed by removal of poles and substitution of catenary suspension to replace the old direct suspension, with a saving in net operating cost

This article, showing a method for improving operating conditions on many interurban railways, is abstracted from a paper presented at the summer meeting of the Central Electric Railway Association, Detroit, Mich., June 30-July 2, 1927. The plan is well worth the consideration of managements faced with replacement of the contact system.

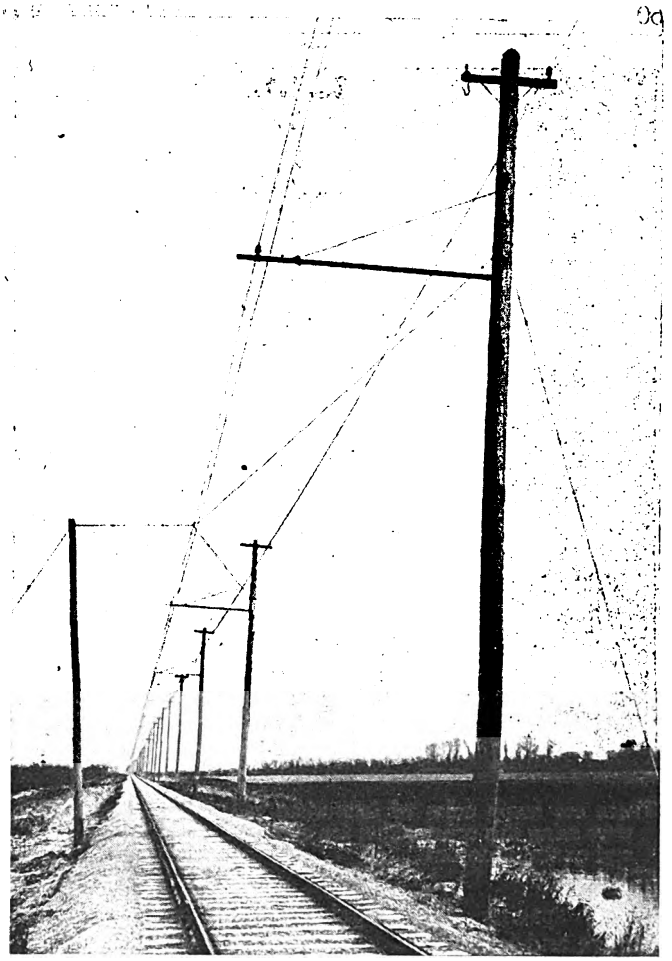
DURING a span of twenty years since most of the interurban railways were built, the life of an ordinary untreated cedar pole has passed, the usefulness of the average piece of direct-suspension overhead has been spent, service requirements on the roadbed and feeder systems have changed, the automobile may have changed the entire makeup of the railroad from a slow-operating system of local trains to a high-speed freight and passenger service between large towns, and so on. However, we are now interested in poles and overhead.

If a specific interurban line has been properly maintained, every pole, every bracket arm, every guy, every trolley span, and every piece of hardware is carrying its respective load with the proper factor of safety. If the line has been neglected, the overhead system is now quite unreliable, the weak spots are upheld by the strong, and if service is maintained at all it is maintained at a cost all out of proportion to that necessary for good overhead.

The road maintaining a worn-out overhead may be facing the serious problem of complete rehabilitation, while the road with proper maintenance may be approaching the same problem, inasmuch as the service the road hopes to maintain may call for a more substantial overhead, both mechanically and electrically.

Rehabilitation of interurban overhead construction may be done using light catenary as the overhead system. First, let me enumerate some of the reasons for such rehabilitation. These are:

1. Worn-out overhead.
2. Speed requirements.
3. Service and reliability as demanded by the public.
4. Visibility.
5. Appearance.
6. Maintenance reduction.



A tangent on a well-constructed line using a light catenary suspension

All but item 1 may occur on either the well maintained or poorly maintained line.

Let us first determine why some form of light catenary is suggested. This can best be accomplished by enumerating its advantages:

1. Constant height of trolley wire, providing smooth under-run.
2. Less delay due to trolley wire breakage.
3. The supporting system may be used for added conductivity.
4. Porcelain insulation, which is more reliable, may be used.
5. Long spans give good signal visibility and pole clearances.
6. Voltage range is possible for the same overhead.
7. Appearance is good.

If a trolley wire could be stretched from one end of the line to the other without supports, and would maintain a constant height relative to rail, conditions would be ideal—no hard spots due to hardware and no sudden angles in wire. This is approached by catenary construction and the advantages on this score are less abuse, longer life and less maintenance. The latter includes trolley wheel wear and base breakage.

Consider first the system which must be rebuilt from the ground up. A new direct-suspension system on 35-ft. wood poles, not including telephone, high lines and feeder, would cost approximately $3,000 per mile including poles, trolley wire, fittings and labor. This cost is equivalent to that for a light catenary system employing $\frac{5}{16}$-in. Siemens-Martin steel messenger wire, T-bar bracket arms, porcelain messenger wire insulators, with 15-ft.

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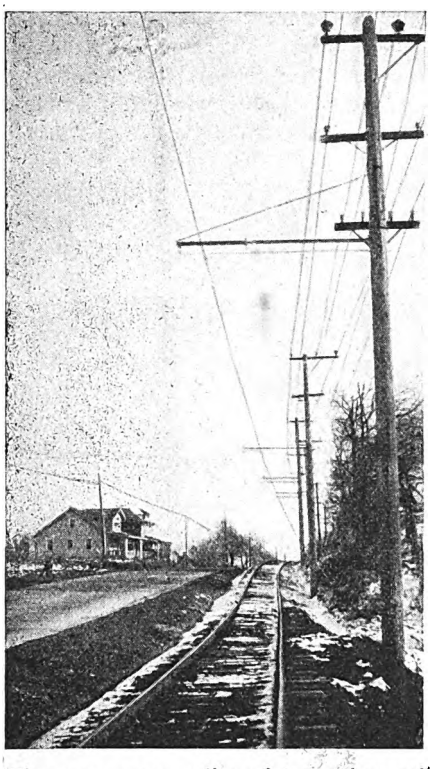
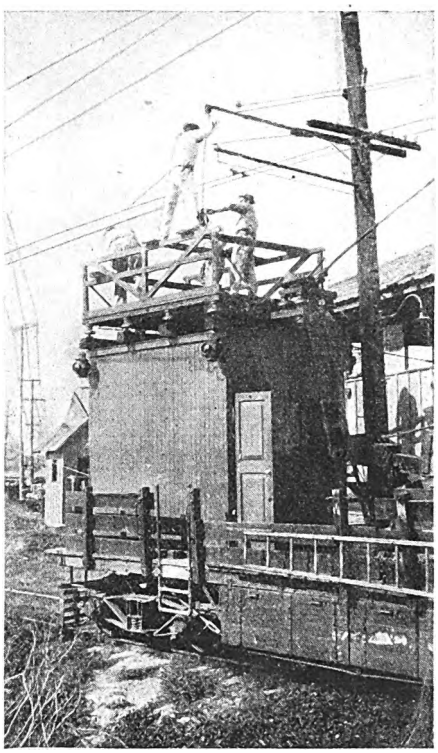
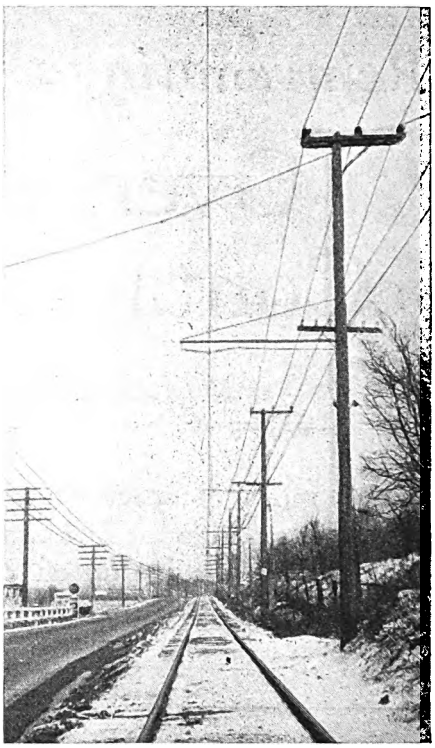


There are many miles of interurban railways using this construction for overhead and transmission line



Method that was used by one company in changing from direct suspension to the catenary system



Short pole spacing with low poles was used on many miles of construction, which is not economical today

hanger spacing. This again includes trolley wire, old fittings and labor.

The direct suspension system would necessitate 100-ft. pole spacing, while the catenary system of equivalent cost would use a greater pole spacing, for example, 150 ft., or 52 poles per mile for direct suspension, and 36 for catenary. Western red cedar, white cedar, or other classes of poles bought under specifications today are capable of supporting a 600-lb. weight with a factor of safety of 6, at the end of a 9-ft. bracket arm without guys, the arm attached 20 ft. above the ground line of the pole. The light catenary system just mentioned only weighs 1.1 lb. per foot with no ice or wind loading, and approximately twice as much with ice and wind loading. Under adverse conditions in winter a span 200 ft. long would weigh 440 lb.; adding the weight of pole hardware, the total weight is less than 500 lb. per span at such a time. Consequently, it is not only safe to assume, but good common sense to recommend, that pole spacings of 200 ft. on wood poles are desirable. I enjoyed the privilege of assisting on a 20-mile job of rebuilding three years ago where the spacing was 225 ft. This line withstood a recent cyclone without a pole failure other than one or two due to falling buildings. And even with this trouble, the system was quickly pulled into shape without additional material, and with a very slight reconstruction charge. With this greater pole spacing, a catenary system built on the same basis as that previously mentioned would cost about $300 less per mile. There are numerous advantages with this extended spacing other than those that have been mentioned. For instance:

1. The maintenance and depreciation cost per mile is reduced chiefly through the lesser number of poles.

2. There is less hazard through insulator failure than with the line with more insulated points per mile. This hazard is ridiculously low compared to direct suspension with its many points of insulation employing inferior insulators.

3. Greater visibility is obtained.

4. Less hazard to the transmission line if it is mounted on the poles.

5. Stock in warehouse can be reduced.

6. Power leakage is less.

For double-track cross-span construction there is a greater saving in favor of the catenary employing wood poles, and it is even possible to show that a two-track line using light steel bridges spaced 300 ft. apart can be erected for the cost of two lines of wood poles spaced at 100-ft. intervals.

Revamping the well-maintained direct suspension system requires a little broader view than the complete rebuilding just described. In some instances, the yearly charge incurred by rebuilding is no higher than the yearly maintenance on the direct suspension line. However, this is not always true.

In order more clearly to bring out the conditions to be met and the respective solutions, take two of the more common examples of rebuilding, viz.:

1. A wood pole line, spacing 100 ft., supports of pipe brackets, direct suspension, 35 to 40-ft. poles with a 33-kv. transmission line on top—a telephone line and feeder on wood crossarms.

2. Same as above, except 30-ft. poles and no high line.

The conditions of example 1 are illustrated in two of the illustrations.

For a light catenary system, a wider pole spacing must be adopted. Inasmuch as the present spacing is 100 ft., it is reasonable to think a 200-ft. spacing would be economical since fewer poles must be touched. It will be necessary to remove every second pole, including all attachments, equip the remaining poles with new pole brackets (for strength) and attach pins and insulators for supporting the messenger wire. The catenary sys-

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tem may then be strung, which gives us a system something like that illustrated in the picture on page 59.

Taking partial credit on the portion above ground of the recovered poles, and also the high-tension insulators, the cost of rebuilding this single-track system would be $800 per mile. No credit for pole brackets, ears, hangers, small insulators, and other pole line hardware is taken. Trolley wire is not considered, inasmuch as it would be on an item in the direct suspension maintenance, if replacing were necessary.

Based on yearly costs, the following figures have been prepared, taking the average of 835 miles of line on five properties for direct suspension and the average of 665 miles on four properties for catenary suspension:

	Cost Per Mile Per Year — Direct Suspension	Catenary Suspension
Maintenance	$79.90	$58.60
Pole renewals	150.00	75.00
Interest on $800 new investment at 7 per cent	.....	56.00
Added depreciation ($800 in fifteen years)	.....	53.30
	$229.90	$242.90

In brief, the yearly costs for replacement with catenary are not out of line. Assuming a saving in high line maintenance would be made as the result of longer spans and fewer insulators, the annual cost of the catenary construction may be considered as equal to direct suspension. But this only considers the tangible costs of the two types. If the indirect savings are taken into account, such as the possibility of higher speeds, greater freedom from delays and interruptions to service, etc., it is apparent that although these are difficult to compute definitely the catenary construction offers attractive economies in the modernization program on any interurban road. Furthermore, the new investment of $800 a mile can be advantageously spaced out to avoid large outlay in any one year and to make best use of the direct suspension materials replaced.

In the second example the poles are not of sufficient height to use a 200-ft. spacing with the catenary. Hence, either the line may be rebuilt, using longer poles at an economical pole spacing, or catenary at 100-ft. pole spacing may be adopted. If the entire line were rebuilt, the yearly costs would work out as follows:

	Cost Per Mile Per Year 100 Ft. Direct Suspension	200 Ft. Catenary Suspension
Maintenance	$79.90	$58.60
Pole renewals	150.00	75.00
Interest on cost of rebuilding ($1,300 at 7 per cent)	.....	91.00
Added depreciation fifteen years	.....	86.70
	$229.90	$311.30

The annual cost for the catenary can, of course, be reduced by taking some credit on the old poles and materials released in rebuilding.

If 100-ft. pole spacing for the catenary is maintained, the direct suspension annual cost is $229.90 and the catenary increases to $345.25 due to the same number of pole renewals as with direct suspension. However, this is only a step in the change-over and should be considered as such, the final step being the change from 100 ft. to some longer and more economical pole spacing.

Change-overs or rebuilding of this kind can be most economically handled by working a section at a time, preferably where the trolley wire is badly worn. For instance, a system is 100 miles long. Overhead materials cost $30 per mile per year. On 100 miles, that would be $3,000. Assuming the reproduction cost of overhead materials exclusive of trolley wire on a single mile of track to cost $400, and assuming the life of these materials to be half spent, any materials recovered during a rebuilding program and shifted to another section would amount to $200 instead of $400 per mile. Putting it in a different way, if the reproduction value of these materials is maintained at $400 per mile, then, due to their life being half spent, it is safe to assume that if reused the maintenance figure should double; instead of being $30 per mile, it becomes $60.

Assume 10 miles to be rebuilt the first year. At $200 per mile, $2,000 worth of overhead at the depreciated value would be recovered. With a maintenance cost of $30 per mile for overhead materials, or $2,000/30, 67 of the remaining 90 miles have been taken care of with reclaimed materials. This same scheme can be used throughout the rebuilding further to cut down the yearly maintenance figure and fixed annual changes.

I have tried to show you that a light type of catenary is economical. We have tried to obtain public patronage by the appeal of appearance; we have used new cars, newly upholstered seats, color combinations and comfort in general. Why not add to this series of improvements by securing the ability to operate and maintain regularly high-speed schedules, through the installation of a more reliable overhead? Thus, you, as operators, will save money by the installation of light catenary, while the rider will save time through the use of the road, which means more riders and more net revenue.

Safety Platform Light Suspended from Span Wire

ABOVE the safety platform of the Municipal Railway of San Francisco at Van Ness Avenue and Geary Street an electric light with a bowl reflector has been suspended from the trolley span wire. At night this illuminates brightly the concrete bumper at the end toward approaching vehicles. The light is controlled by a switch on a nearby pole.

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Maintenance Methods *and* Devices

Cabinet for Paint Storage

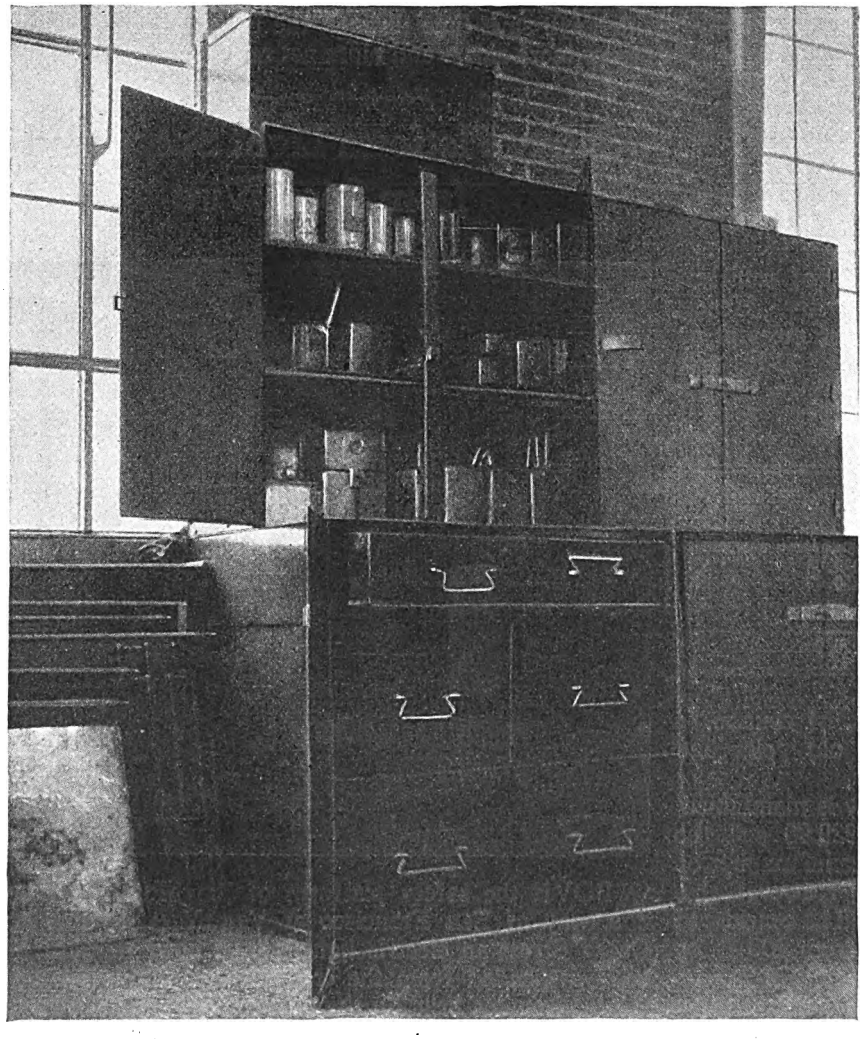
PARTIALLY consumed cans of paint, paint brushes, sponges, pumice stone and other small portions of the various kinds of material used for the painting process in the Academy Junction shops of the Washington, Baltimore & Annapolis Electric Railroad are being systematically, safely and cleanly stored in a fireproof metallic cabinet constructed for the purpose. This cabinet with its rugged construction and well-balanced proportions was constructed in the company's shop under the supervision of Foreman Painter George Watts.

The frame is made of 2-in. angles and is incased by $\frac{3}{16}$-in. sheet steel all riveted securely together by means of $\frac{1}{4}$-in. round-head rivets. The lower, or bench, section is 7 ft. long, 33 in. high and 30 in. wide. The upper section is 7 ft. long, 34 in. high and 15 in. wide.

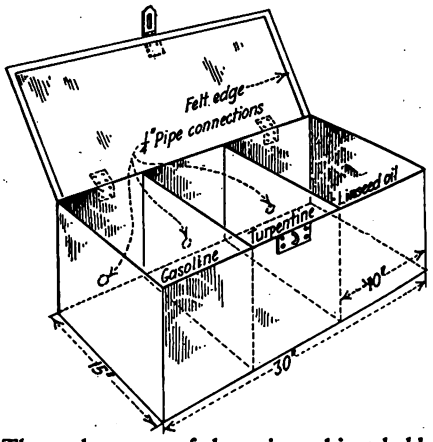
The upper section is divided into two 42-in. sections by means of a $\frac{3}{16}$-in. steel plate partition. Each section has two shelves of $\frac{3}{16}$-in. steel plate resting on $1\frac{1}{4}$-in. angles riveted to the sides and center. The two $\frac{3}{16}$-in. steel doors are equipped with strong hinges and a clasp for padlocking. The upper portion is used exclusively for storing opened cans of paint, used brushes, small amounts of turpentine, gasoline, etc.

The lower section also has two 42-in. sections separated by a $\frac{3}{16}$-in. steel plate, each of which is provided with six drawers of various sizes, made of $\frac{3}{4}$-in. ash and lined with No. 16 galvanized iron. Large handles on each drawer, together with the 1-in. steel angle tracks, make for easy sliding movement. These drawers are used for the storage of dry stocks such as sponges, cheesecloth, rags, sand paper, scrubbing material, torches, etc. Each lower section has sheet-steel doors. With all doors closed and locked the cabinet provides a safe and fireproof receptacle for the storage of small quantities of inflammable material.

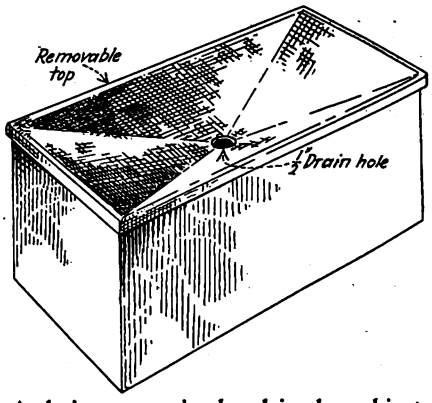
A receptacle for the storage of small quantities of gasoline, turpentine and linseed oil, placed on top of the cabinet, is an unusual and worthwhile feature. This is a 30-in. x 12-in. x 15-in. tank made of $\frac{1}{16}$-in. sheet steel and provided with a sheet-steel cover. The outer edges of this



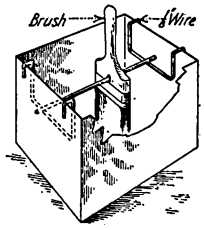
A paint storage cabinet that has been found quite effective in the W., B. & A. shops at Academy Junction



The tank on top of the paint cabinet holds gasoline, turpentine and linseed oil



A drainage pan is placed in the cabinet below the faucets tapping the overhead tank



Handy receptacles for storing paint brushes are made from varnish cans

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cover are lined with ⅛-in. felt to make the container dustproof. This tank is divided into three sections. From the bottom of each a ¼-in. iron pipe extends to a point in the upper section of the cabinet directly under the first shelf, with a valve to permit of easy withdrawal of the liquid when required. Directly underneath the valves is placed a galvanized-iron drainage pan to catch the waste. This pan is made of No. 16 galvanized iron and is 13½ in. long, 6 in. wide and 5½ in. high, with a removable top made of the same material. The removable top slopes toward the center from all edges, with a ½-in. drainage hole.

The storage tank provides a convenient supply of small quantities of the liquids.

Another feature is the method for the storage of paint brushes. Individual varnish cans with the covers cut off are used. Across the top edges of these cans on either end is suspended a ⅛-in. wire hook as shown in one of the illustrations. The head of each brush is drilled with a $\frac{5}{32}$-in. hole. The brush to be stored is placed on a straight ⅛-in. wire. This permits of vertical storage of the brushes in the liquid and keeps the brush off the bottom of the can.

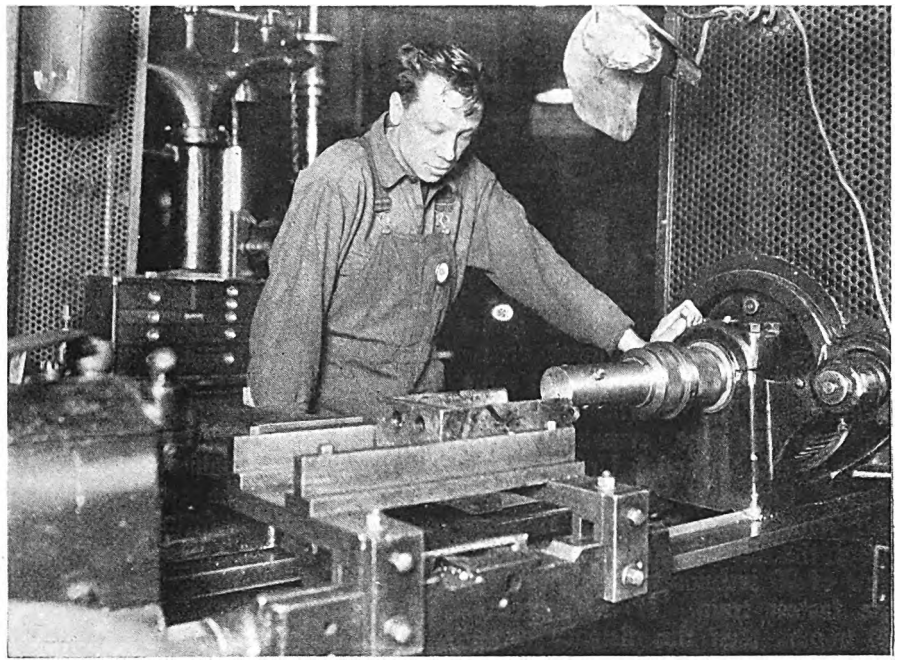
This cabinet with its auxiliary features is centrally located in the paint shop and is readily accessible. It provides a safe and fireproof storage place for inflammable paints, varnishes, etc., and helps to keep the shop clean.

Special Boring Bar for Journal Bearings

JOURNAL bearings used in the subway cars of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., have an end section so that in reboring after babbitting the boring bar cannot pass entirely through the brass. The practice of the railway is to bore out each bearing to fit the particular journal with which it is to be used. There is thus a large variety of sizes between the standard and scrapping dimensions of bearings. To bore out one of these bearings with ordinary methods would take a workman one hour. By use of a fixture for holding the bearing and a special type of boring bar, a floor to floor output time was made possible of ten minutes on each bearing.

The fixture for holding the bearing accurately is clamped to the lathe carriage. A bearing placed in this fixture is held securely by two clamping bolts. The work is then moved toward the boring bar, which is fastened to the headstock of the lathe by a spring-collet chuck, the use of which chuck centers the boring bar accurately. This is held firmly in place by a retaining bar that passes through the hollow spindle of the lathe. It is supported further by the spring-collet chuck, which adds materially to the firmness of the bar. The cutter is held in an adjustable nut placed at the other end of the bar. When set to the required size for boring it is locked in place by a wedge operated by nuts.

The cutting tool is set by means of a micrometer which is gaged to one-half the journal bearing diameter plus one-half of the boring bar with an additional clearance of 0.005 in. By this method an accurate bearing fit for each axle is assured.



Boring an axle bearing with a special fixture and boring bar at the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation

Another Prize Winner Announced Next Week

JUDGES in ELECTRIC RAILWAY JOURNAL's Maintenance Contest have picked the winning article from those published in the June 18 issue and the winner of the monthly prize for June will be announced next week. The maintenance data sheet section of that issue will also contain another lot of articles submitted in the competition. From these the judges will select one to receive the prize for July, and announcement with respect to the winning contestant will be made in the Aug. 20 issue.

Aug. 1, which is the closing date for articles to be received for the three capital prizes, is approaching rapidly. There are but three weeks left. The monthly prize awards will continue throughout the year, but material to be judged for the $200, $100 and $50 prizes must be in by Aug. 1. Send in the best practices first and do not delay!

Here is a brief summary of the contest conditions:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated prior to Aug. 1, 1927. For the monthly prizes manuscripts will be received until April 30, 1928.
7. Illustration material may be in the form of drawings, sketches, blueprints, or photographs. All sheets should be marked "Maintenance Competition."
8. Details of the conditions not given above will be found in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

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New Equipment Available

Points to Be Considered When Installing Crossing Signals

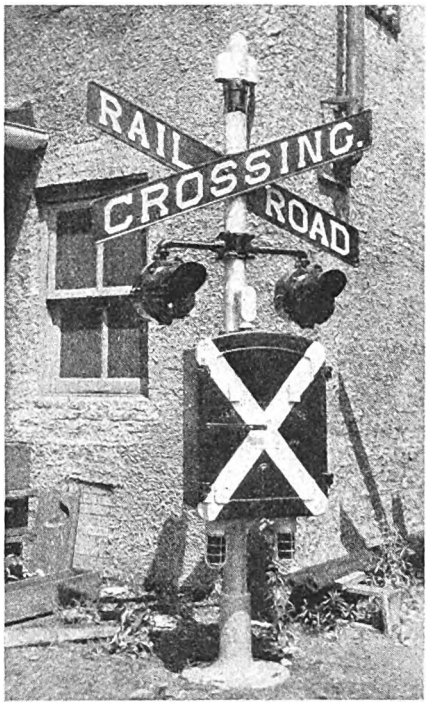
By Carl P. Nachod
President Nachod & United States Signal Company, Inc.

With the increased automobile traffic over interurban grade crossings, automatic highway crossing signals have been subject to some evolution. The overhead starting contactor of the crossing signal made by the Nachod & United States Signal Company, Louisville, Ky., should be placed at such a distance from the crossing that a warning time of 20 seconds will be given for the fastest train. If this speed is 40 m.p.h., then the distance is approximately 1,200 ft. A longer warning than this will result in its disregard by motorists, and it has been shown that 20 seconds is sufficient for a slow ox team to cross.

The motorman's pilot or indicator is an invaluable check to show the motorman that the warning signal has operated. This is a separate hooded light signal placed three or four spans ahead of the starting contactor and pointed directly at the motorman. When he sees this light flash he knows that the warning is being given at the crossing, which may be some distance ahead, or around a curve.

A number of railway commissions have favored the flashing light system of warning indication as specified by the American Railway Association, Signal Division. In New York State, for instance, this is the only official warning permitted for new installations. A bell may be used as an audible signal in connection with the flashing lights, but it certainly should not be used as a warning alone without the lights. If the automobilist drives too close to the crossing standard and stops at one side of it, he will not be able to see the flashing of the lights nor tell when they have been discontinued, but the nearer he is to the signal the louder the bell will sound to him. Moreover, in an accident case, a witness anywhere in the vicinity of the bell could testify that the warning was being given, but with flashing lights, only a witness in direct line of their beams could so testify. For residence locations, bells may be very objectionable, and they should be provided with auxiliary time cut-outs.

It is of the utmost importance that the crossing standard should be as conspicuous as possible. The design shown is striped with aluminum paint over black asphaltum. To locate the crossing at night, independently of the automobile headlight, the yellow light burns continuously in one of the marine fittings at the bottom of the case. This illuminates the base of the standard. It also serves to show that current is on the apparatus and that it is ready to give its warning. Only one of these yellow lamps burns at a time, but should it burn out, the other yellow lamp will be cut in automatically through a reserve lamp relay. The yellow lamps, however, do not burn when the car or train is approaching.



Single standard crossing signal with four projectors

The relays, including those that start and stop the indications, as well as the one which flashes the lights, are housed in a weatherproof gasketed locked relay box convenient for inspection. All wiring is brought into the standard through an outlet at the top in a cable dropped from a messenger. The projectors themselves have parabolic glass mirrors, 56-watt headlight type lamps with concentrated filament and are provided with convex red roundels, which give a spread of about 30 deg. to the beam, changing its section from circular to elliptical. These projectors are supported on pipe brackets with unions, inclosing all wiring and making them adjustable independently, so that one may be pointed for distant viewing, or toward an automobile approaching on a curve, and the other for a nearby indication. When the lamps are supplied from the 600-volt d.c. trolley circuit they are connected in series, but each is shunted separately, so that a failure of any lamp will not open the circuit to the others. A separate flasher relay of the air-break type is used to flash the lamps.

Improvements in relay construction have been made for high-speed systems, so that the car, when passing the overhead trolley contactor, has only to pick up a light relay tongue, moving it $\frac{1}{16}$ in. to make a contact through a "stick" circuit, which will apply and hold current to the main relay until that acts to throw on the warning signal. After this the main relay opens all contactor circuits. Since there are accidental low voltages on interurban systems, due to partial failure of power, the crossing signal must be designed to operate over a wide range, and is actually operative down to one-half the normal line voltage.

The accompanying illustration shows a single standard having all four projectors mounted on it. A preferable arrangement is with two standards, having two projectors each, the relay box being mounted on one of them, or else on a separate pole.

On a double-track crossing the stopping contactor may be set on the far side of the crossing at any desired distance. If this distance is such that the car might be stopped within it, as after an accident, then the warning signal would not be cut off, and all the occupants of the car could be witnesses that the warning was being given. However, if this requires too great a distance, as, for instance, more than 500 ft., the warning might be disregarded by automobilsts, since the danger condition ceases with the passage of the car, and the warning should cease with it.

For single-track crossings this placing of the contactors necessitates overlapped stopping control, the relay system being such that only the contactor on the far side acts to cut off the signal.

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Association Activities

"Getting Out of the Rut" Occupies Attention of C.E.R.A. at Detroit

Track design and maintenance, overhead line economics and methods of stimulating business are approached from the viewpoint of meeting present-day conditions

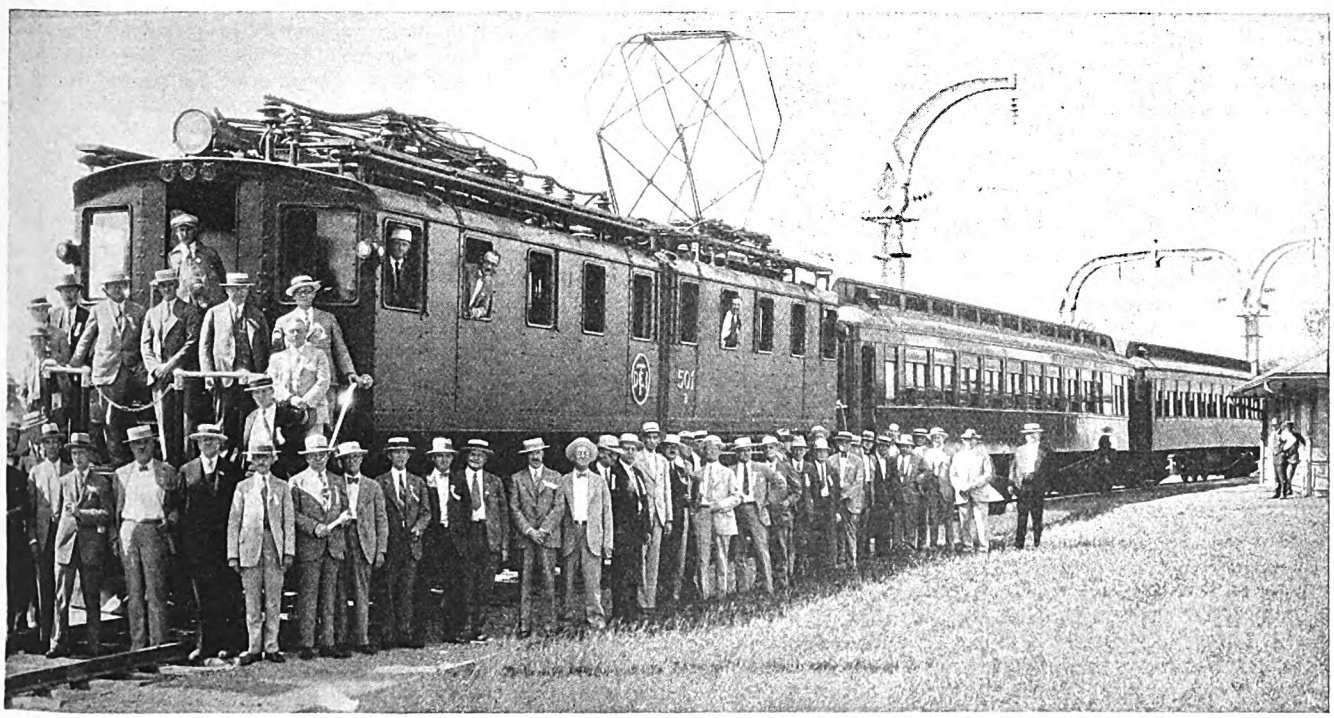
UNDER various subjects and titles the Central Electric Railway Association, at its annual summer meeting held in Detroit on June 29-July 1, discussed the general topic of "Getting Out of the Rut." The construction of electric railway track and its relation to revenue, the application of merchandising methods to the sale of transportation, and an analysis of overhead line economics were the subjects of papers and discussions—all approached from the angle of breaking down the walls of habit and precedent so as to provide better, more reliable and attractive transportation service.

The high spot in the discussion of selling methods was reached in a straight-from-the-shoulder talk by Ernest Cohn, secretary Homer McKee Advertising Company, Indianapolis, Ind. "Electric railways have been asleep," said Mr. Cohn, "while the automobile won the public ear and ran away with a goodly share of their business. Your first job is to whip your own people into line," he continued. "You need to buy hot water bottles for some of them to warm their feet and keep them from quitting in the face of difficulty," was another of his semi-humorous broadsides at the industry.

Mr. Cohn pointed out the part which co-operative advertising on a sufficiently extensive scale could be made to play in winning back public favor and patronage for transportation companies. To illustrate his views, he cited a number of examples of other industries which through concerted and effective advertising had turned the tide of popular favor when they were faced with threatening business conditions. He mentioned the success of the campaign by California grape growers to dispose of their crop by popularizing the eating of raisins when they were faced with the elimination of their market through the coming of prohibition. The "Say it with flowers" campaign by florists, and the "Send it to the laundry" campaign by the laundry machinery manufacturers were other examples cited by Mr. Cohn in support of his views.

In undertaking such work, the speaker strongly urged the importance of employing men competent to judge the proper approach to the public mind. He said that an advertising problem such as that confronting the electric railways is one which involves the state of mind of the community. He pointed out the importance of talking in a language which will penetrate the consciousness of the average man or woman by translation of the transportation sales story into appeals of popular interest.

Advertising of the type advocated is expensive if it is to be made effective, according to Mr. Cohn. He added suggestions for two other methods of reaching the public, one through the employment of trained speakers to address public groups, and the other through the use of effective signs on the cars themselves. He urged, however, that such advertising carried on the cars be made sightly by properly arranged and illuminated frames and by the use of high-grade art work.



Delegates to C.E.R.A. summer meeting inspected the new Ford electric locomotive of the Detroit, Toledo & Ironton Railroad

Better Business Methods Advocated

The subject of better business methods was introduced by President Ackerman. Closer co-operation between the connecting lines in the central interurban territory was strongly urged as a means of building both passenger and freight traffic. "Undoubtedly all of you have known, as I have known, the instances where connecting interurban carriers held off through-freight serv-

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ice for a considerable time after it became evident that freight must become a necessary and important element of the interurban railway business, simply because the executives of some of the lines could not agree upon the details of a through-freight service," he said. "In some instances they disagreed as to the division of revenue; in others as to furnishing equipment, as to the ability of some of the lines to participate because of lack of power or suitable freight-handling facilities. In many such cases, it never occurred to the fellow who sat in the most favorable position for the operation of through service by being equipped, we will say, with adequate rolling stock, track, power and freight-handling facilities, that he could help his own business by helping the other fellow not so favorably situated, through furnishing more than his proper share of the equipment, power and other requirements for a through service."

President Ackerman pointed to the improvement in relations between the connecting carriers in the Central Electric Railway Association territory as evidence of definite progress and widened opportunity. He urged, however, the need for more general attendance by chief executives at meetings of traffic officers and other groups charged with the direct responsibility of interline relations.

An open-door policy in dealings with the press was strongly urged as a means of bringing about favorable publicity. Direct co-operation by railway executives with the committees on public utility information was held to be another means of stimulating better public opinion. The part which the chief executive may play in maintaining proper contact with the press, public and employees was held by Mr. Ackerman to be one of the most important phases of building better business.

Condition of Track Affects Revenues

Types of track construction most suitable for paved streets were discussed in a paper by W. F. Graves, chief engineer Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., which is abstracted elsewhere. Some fundamentals of track design were covered by A. C. Irwin, manager railway department Portland Cement Association. The relation of track condition to interurban revenues was handled by W. L. Butler, vice-president Cincinnati, Hamilton & Dayton Railway. Abstracts of these papers are printed elsewhere. In each case, the approach to the subject was from the angle of stimulating better business through the improvement of service and facilities.

The need for better track was supported by C. H. Clark, engineer of maintenance of way Cleveland Railway. He outlined the experience with tilted rail in Cleveland during a period of twelve to fifteen years and said that this practice had entirely eliminated corrugation on straight track. According to Mr. Clark, rail laid level on Payne Avenue in Cleveland seventeen years ago had developed corrugations in the first few years, but these had been removed by grinding the rail head to a taper of 1 in 25 and corrugations had not recurred.

The general subject of track noise was commented on by Professor Ewing of Purdue University. The speaker said that the character of construction has little effect upon the volume of noise if the ear is within 3 ft. of the rail. Although different kinds of construction result in a different quality of noise, the volume is about the same at this distance. The noise on the sidewalk or in an adjacent building resulting from a given type of construction was held to depend more upon the character of the street surface than upon the track itself. The man on the street or in an adjacent building hears a reflected rather than a direct noise. If this reflection of sound did not take place, the ordinary noise of street car operation would not be undesirable. As an illustration of the effect of the street surfacing in reflecting sound, the speaker said that careful measurements of noise with special apparatus had shown that open track generates about the same noise as paved track, but since it reflects very much less the net result is a quieter construction.

Regarding the causes of rail corrugation, Professor Ewing attributed much of the existing difference of opinion to the fact that corrugations result from many contributing causes, any one of which may predominate in a particular piece of construction. He held that rail corrugation is not only a rail problem but is just as much an equipment problem. In any given instance both the character of the rail structure and the character of the load which is carried affect the final result obtained. Vertical vibration of moving cars and wheel slippage were cited as contributing causes to corrugation which depend upon the equipment design. Elimination of rail corrugation, according to Professor Ewing, involves two lines of procedure, one of which is the control of the track construction and the other the control of the loads imposed on the rail. Adequate co-ordination of track and equipment construction involves fitting the load and supporting structure to each other so as not to cause deformation resulting from excessive localized stresses.

As a result of the discussion arising in this session devoted to the relation of track to railway business, a special committee was appointed on motion of H. A. Nicholl, general manager Union Traction Company of Indiana, to study and promote the improvement of construction and maintenance practices. A similar committee devoting its attention to distribution and overhead line practices was authorized on motion of G. R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway.

Under the leadership of L. G. Tighe, chairman of the special committee on the promotion of more profitable business, the entire session on Thursday morning was devoted to this topic. In introducing the subject Mr. Tighe questioned the extent and effectiveness to which electric railways are merchandising their service. He held that there are many ways of promoting riding and that effective results cannot be accomplished by merely putting into service improved equipment in the hope that people will ride. "More people are riding today than ever before, but we are not getting our adequate share," said Mr. Tighe. "It is necessary to go after this business if we want it on our cars."

C. L. Van Auken, vice-president and general manager of *Electric Traction*, listed and discussed some of the methods which have been applied by various properties in the effort to increase revenues. Among the practices mentioned by Mr. Van Auken were the better business campaign conducted by the Chicago, Milwaukee & North Shore Railway through its employees, use of 5-cent passes in Fort Worth by the Northern Texas Traction Company, the house-to-house canvass carried on by the Grand Rapids Railway, the selling of rides wholesale to department stores that has been tried in a number of cities, bonuses given to agents Cleveland Southwestern Railway & Light Company, parlor car service operated by the Interstate Public Service Company and various methods used by a number of properties that have actively endeavored to build up chartered bus service. Development of freight business by the Interstate Public Service Company, use of advertising in Birmingham, the development of a golf course for attracting railway riding in Evanston, installation of a bargain fare rate during off-peak hours in East St. Louis, sale of bathing and dancing privileges with interurban rides on the Galveston-Houston Electric Railway, and the sale of coupon books through its employees by the Chicago, South Bend & Northern Indiana Railway were among some of the other efforts to stimulate business listed by Mr. Van Auken.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***July 11-14*—American Society Civil Engineers, convention, Denver, Col.**

***July 22, 23*—Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

***July 27-29*—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Biltmore Hotel, Atlanta, Ga.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, South Bend, Ind.**

***Sept. 13-15*— International City Managers Association, Dubuque, Ia.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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In the discussion of this subject, L. M. Brown, vice-president Interstate Public Service Company, said that intense personal solicitation is necessary to the development of transportation business in this day and age. Success demands that service be kept right, that equipment be up to date and employees inspired with the need of selling their service. Close personal touch between the management, the employees and the public is essential to success, according to Mr. Brown.

Pick-up and delivery in connection with freight service was held by H. A. Nicholls to be one of the most effective means of stimulating business for interurban lines. He held that the future of the central interurban roads is dependent largely upon the development of freight and express business.

In speaking on the practice of the Chicago, South Bend & Northern Indiana Railway of selling coupon books at a 25-cent reduction over the regular fare, Mr. Green said that this had not resulted in increasing revenues materially but had effectively stopped a decrease which had previously set in. The practice results in the sale of 1,800 books a month and greatly stimulates the interest of both men and superintendents in the welfare of their property. Mr. Green maintained that every new effort to stimulate business is worth while. He said that the general result of such efforts is to improve the morale of men and officials.

The trend of overhead construction was covered in a paper by L. W. Birch, line material engineer Ohio Brass Company, which is abstracted elsewhere in this issue. Written discussions were read by W. L. Margetts of the General Electric Company and L. F. Brahmer of the Westinghouse Electric & Manufacturing Company.

During the afternoons, inspection trips were made by the delegates to various points of interest in Detroit, including the River Rouge plant of the Ford Motor Company and the electrified section of the Detroit, Toledo & Ironton Railroad.

At the evening dinner on Wednesday, W. L. Wilkie, attorney Northern Ohio Power & Light Company, was the principal speaker. He pointed out the need, in dealing with public officials, of recognizing their responsiveness to the public they represent. He explained that public officials are powerless to act in accordance with what they know and believe to be right in dealing with utilities, unless the case has been adequately sold to the public itself.

Cincinnati was selected as the place for the next meeting, upon the invitation of J. B. Stewart, Jr., general manager Cincinnati Street Railway.

The Foundation of Good Interurban Service Is Good Track*

By William L. Butler
Vice-President Cincinnati, Hamilton & Dayton Railway

IN THESE days when so much thought and study is being given to the problems of the electric railways—especially how the revenues may be increased and operating expenses reduced—it is but natural that the question of the proper standards of track maintenance, both as an engineering problem and more particularly with reference to the effect on gross and net revenues, should receive prolonged consideration.

The cost of track maintenance must be reduced to the minimum consistent with true economy. By this is meant not only the lowest attainable cost for the proper maintenance of track, considered by itself, but especially as regards the correlation of that cost to attainable net revenues. We all recognize that it would be poor economy to maintain track at a standard too low to produce a maximum net return and conversely it follows that a management, if challenged, would have difficulty in justifying a standard of maintenance higher than would be warranted to produce the maximum net return, all things being considered.

I am convinced from a number of years of contact with this problem and rather extensive observation of the electric railways of the country—particularly the interurbans, to which I will largely confine myself in this discussion—that a large number of the electric railways are operating at the present time with a subnormal standard of maintenance, a standard that is too low to produce the maximum attainable net return.

Abstract of address before summer meeting Central Electric Railway Association, Detroit, Mich., June 29-July 1, 1927.

Times Have Changed

The financial vicissitudes of the electric railways during the last decade are too well known to all of you to require any extended comment. Most companies are too poor, or feel themselves too poor, to support a very high standard of maintenance. In addition, we have not all realized that the determination of proper standards of maintenance is not entirely an engineering question but varies with the changed conditions under which we are required to operate.

Today we are operating under entirely different conditions than those existing when most of our present interurban lines were built. The horse and buggy have given way to the private automobile. The dirt or poor macadam road has been replaced by modern hard-surfaced highways. Operating over these improved highways a new competitor, the motor bus, has sprung up and in many sections offers formidable competition to the interurbans.

The standard of track construction and maintenance that would provide a reasonably satisfactory transportation service in the days of dirt and poor macadam roads and horse-drawn vehicles will not suffice at the present time in competition with smooth, hard-surface roads and private automobiles whose riding qualities are being improved from year to year with astonishing rapidity. It is not an accident that the automobile manufacturers have spent so much time, energy and money in perfecting the riding qualities of their cars—both the low-priced light car and the more expensive large automobile—through the development and general use of balloon tires, shock absorbers, longer and better designed springs, improved principles of spring suspension, reduction of unsprung weights in automobile chassis and other like improvements. All these improvements are in response to the insistent, popular demand for a more comfortable riding car.

What have the interurban railways done during a like period to meet the public demand for more comfortable service? With a few notable exceptions they have done little or nothing. Their tracks are in no better condition, and in many instances they are in worse condition than they were a decade ago. The Electric Railway Journal has for some years made an annual compilation of data concerning the mileage of track extensions, track abandonments and track reconstruction. Confining ourselves to the matter of track reconstruction, as compared to competitive highway reconstruction, and first calling your attention to the fact that the first data with reference thereto was printed by the Journal in 1917, we find that there were reconstructed 5,637.78 miles of track in the United States in the ten years from 1917 to 1926, both inclusive. According to the federal census of 1922, the total mileage of track operated by electric railways was 43,931.86 miles. The change in track mileage from 1922 to 1926 was not material, the extensions, reported by Electric Railway Journal, approximately offsetting the abandonments. It would thus appear that in the decade ending with 1926, of the total track mileage of the electric railways of the country 12.8 per cent was rebuilt or approximately 1.28 per cent per annum on the average. At this rate it would require approximately 78 years to rebuild all of the electric railway track operated at the present time.

113-Year Reconstruction Schedule

The first data reported by Electric Railway Journal for interurban track mileage reconstruction (as distinguished from city track mileage reconstruction) was for the year 1919. In the eight years from 1919 to 1926, both inclusive, there were reported to have been reconstructed 1,254.58 miles of the total interurban track mileage of 17,807.93 reported by the 1922 federal cen-

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sus. The annual reconstruction during this period averaged .0.88 per cent per annum. At this rate it would require over 113 years to reconstruct all the interurban track mileage operated in 1922 without regard to the fact that in this period of reconstruction of over a century it would be necessary to rebuild some of the mileage reconstructed in the earlier years.

It may be that the data and comparisons herein set forth are advisory rather than mathematically accurate. It is quite possible that these data, although compiled by ELECTRIC RAILWAY JOURNAL with care and thoroughness, do not reflect all track mileage reconstructed. Even though the error were considerable, the showing is so shockingly inadequate as to leave no doubt in any one's mind that most of the interurban electric railways are wearing out their tracks without adequate provision for reconstruction.

It will, of course, be argued that interurban track differs from city track in that it is not rebuilt in its entirety, but is usually renewed piecemeal year by year. This piecemeal reconstruction work consists almost entirely of the renewal of ties, ditching and lining and surfacing, which is in the nature of track maintenance. If the data were available, we would find that very little ballast was renewed on the interurbans of the country as a whole and that rail renewals were an insignificant percentage of the total rail tonnage in the tracks. All that the interurbans are doing is to maintain, after a fashion, the same track which was constructed 20 or 30 years ago. In other words, the interurban highway, which is fighting a losing battle in competition with concrete and other hard-surfaced roads, is at best the same highway that was built and operated in old Dobbin's day.

INTERURBAN TRACK PROGRESSIVELY DETERIORATING

As a matter of fact, the interurban highway of today is not as good as it was twenty years ago. Insufficient maintenance and neglect, whether forced by inexorable economic or other conditions, has irreparably damaged a large percentage of the rail. It has become battered and surface-bent and in most cases cannot be put into satisfactory condition except by complete renewal. The situation as regards such trackage is quite similar to that confronting the highway engineer called upon to restore to good condition a neglected hard-surfaced road full of holes, waves and depressions.

Turning for a moment from the condition of interurban railway tracks to that of the rolling stock, according to statistics compiled by ELECTRIC RAILWAY JOURNAL, there were built during the twenty years from 1907 to 1926, 10,044 interurban cars, of which 2,705 were constructed during the last decade. From the same authority we learn that there were all told 14,752 cars in interurban service at the end of the year 1924.

It thus appears that slightly more than two-thirds of the interurban cars of the country have been built within the last twenty years. Only 18.3 per cent of the interurban cars, however, have been constructed during the last ten years. It is very clear that the replacement of interurban cars has fallen below a reasonable level during the last decade. At the rate at which new cars were constructed during that period, it would require almost 55 years to replace the interurban passenger equipment now in use.

In the light of these comparisons, which seem to indicate that interurban track reconstruction is proceeding upon the basis of a 113-year cycle and that interurban car replacements are being made on the basis of a 55-year cycle, assuming a stationary volume of traffic, is there any wonder that the public is being weaned away from the use of the interurban as a means of passenger transportation? All too many of us are in the position of a merchant doing business with fixtures which were modern in his father's day and selling merchandise which was in vogue in the days of the bustle, long trains and leg-o'-mutton sleeves.

NEW CARS NOT ALONE SUFFICIENT

Many are prone to forget that that foundation of good service is good track. New cars are quite necessary, but they do not constitute a panacea for all ills. A new car will prove no more satisfactory to the traveling public when operated over poor track than a 1927 automobile if operated over poor highways, full of holes and ruts. It may not be as fashionable, but it is certainly more comfortable and less aggravating to ride in a rattling "Lizzie" over a smooth concrete road than in a luxurious, expensive limousine over a rough highway. It is a matter of common, every-day observation that automobile drivers shun a highway in poor condition and will go miles out of their way to use a road in perfect condition. A part of this phenomena is to be explained by the desire for speed, but the basic reason is the insistence upon a comfortable ride.

Viewing the interurban situation as a whole, there are some properties that should never have been built and which will drag out their existence to an inglorious end. Others are on the border line where there is serious question as to whether sufficient business can be developed to justify the new capital required. But a large percentage of the interurban mileage in the country has a real field of usefulness. A large proportion of these properties at the present time are making very disappointing financial showings. The question that is uppermost in our minds is whether the results would justify whatever sacrifice might be involved to the present owners, if these properties were modernized and thoroughly rehabilitated. With properties that have potentialities there appears to be no question but that every dictate of self-interest should prompt their owners thoroughly to rehabilitate and modernize trackage and to re-equip the properties with equipment and power facilities of the most modern type.

MODERNIZATION PAYS

My association with the Chicago, Aurora & Elgin Railroad from 1922 to 1926 permitted me to witness the result of an experiment demonstrating the results which follow the thorough reconstruction and modernization of an interurban property possessing economic potentialities. In the spring of 1922 an extensive track rehabilitation program was inaugurated. While it was announced at that time that additional new equipment had been ordered, new substations were about to be constructed and other extensive changes were to be made, the fact was that until August, 1923, the only substantial change in the physical condition of the property was the execution of an ambitious and thorough program of track reconstruction and betterment.

Almost immediately after this program was launched a marked increase in passenger revenues occurred. In the year ended July 31, 1922, prior to the track rehabilitation work, the increase in passenger revenues was only 0.4 per cent over the previous year. In the twelve months ended July 31, 1923—the first year following the completion of the track rehabilitation program—the passenger revenues were 15.3 per cent in excess of those of the corresponding period of the preceding year. In the succeeding twelve months, when additional new rolling stock was in operation throughout the period, an additional passenger revenue increase over the preceding year of 7 per cent was obtained.

This track rehabilitation program did not merely consist of the replacement of ties and the realignment and resurfacing of track. It involved an almost complete reconstruction of track. Old ballast was used to provide a firm subgrade and on top of this new ballast of ample depth was placed. All necessary tie renewals were made. Rail joints were replaced on a large percentage of the property, and a considerable mileage of rail, which was so battered and bent as to be incapable of further satisfactory use, was relaid.

We found, some two years after this rehabilitation program was completed, that our maintenance of way expenses in the twelve months ended May 31, 1925, were 19.9 per cent less than in the twelve months ended May 31, 1922, despite the fact that in this period our car-miles had increased almost 20 per cent. This emphasizes one of the lessons which happily we can all learn concerning the advantages of high track standards—that it is actually less costly in most cases to maintain in first-class condition a well-constructed track than it is to maintain in indifferent condition present-day average interurban track.

We also found on the Chicago, Aurora & Elgin that despite higher wages we were able to reduce the cost of maintaining equipment per car-mile to 65 per cent of what it had cost three

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years previously before track and equipment had been rehabilitated. In the same period car failures per 100,000 car-miles were reduced from 9.6 to 7.9 or 18 per cent. A substantial part of this reduction in maintenance of equipment costs—which please bear in mind occurred while a vastly improved standard of maintenance was established—must be attributed to the lesser wear and tear on equipment with track in first-class condition.

It may interest you to know that the increase in railway operating revenues in 1925 over those in the twelve months ended June 30, 1922, was 65.8 per cent; that the increase in net railway operating revenues for the same periods was 154.4 per cent, and that the balance remaining for the stockholders, after fixed charges and larger deductions for depreciation, increased in these periods from $126,487 to $319,966, or 153 per cent.

Within the last few days, the Cincinnati, Hamilton & Dayton Railway has put into service new interurban and urban types of equipment, and in preparation therefor, and as a means of further stimulating business, has been steadily at work for the past year and intends to continue progressively to improve its interurban and city track standards to the end that it may be in a position favorably to compete with parallel hard-surfaced highways. We feel confident that this expenditure will be productive of a substantial increase in passenger revenues—resulting from the constantly increasing attractiveness of our service. During the calendar year 1926 passenger revenues were more than 6 per cent above 1925.

All of the interurban properties that have made progress during the last few years have given proper attention to the establishment and maintenance of high track standards. The only properties which are successful are those that are modern and in first-class condition. In my opinion, the foundation of good interurban service is good track, and that without good track it is, generally speaking, impossible to make a financial success under present conditions of operation.

Some Fundamentals of Street Railway Track Construction

By A. C. Irwin
Railways Bureau, Portland Cement Association

DEVELOPMENT of most of the appliances that have done most to further the upward progress of humanity has usually started and reached considerable proportions before any scientific analysis or rational design of them has been attempted. This is true, particularly, of that most important portion of the physical property of railroads, namely, the track structure. Only recently has the problem been approached as something that could be evaluated in engineering terms, and at the present time there is very little in print to indicate that engineers have undertaken to solve the question of track construction in the same way that they would design a bridge or a building.

It was early in the history of track construction when cross-ties carrying rails became the only type in use. The cross-ties served two obvious purposes, namely, to distribute the load to the earth and to hold the rails or contact lines to proper gage and in proper position. We thus have the two fundamentals of track construction, first, the line of contact for the wheels and, second, a supporting structure to distribute the load on these contact lines to a more or less yielding base or foundation. If the contact lines (rails) were perfectly smooth, perfectly straight and perfectly level, supported throughout their length by an unyielding base, and if the wheels of the rolling stock were perfectly round, cars would pass without vibration or swaying or bumping. This condition might be likened to that of a perfectly smooth and perfectly round ball rolling over an absolutely plane surface. An approach to these ideal conditions is practicable, and the following requirements are fundamental if what may be termed good track is to result:

1. The entire track structure must be supported on a foundation that will hold it to proper surface.
2. The line of contact (rail) must be hard and strong.

There is only one reason why railroad track gets out of surface, and that is that the foundation is not strong enough to support the loads put upon it. In other words, track construction is not given anywhere near the stability that is demanded for a bridge or a building of even minor character. The fact that the rails of a car track become low with respect to the adjacent pavement surface proves just one thing, that there is an inadequate engineering structure supporting those rails. Ties spaced at customary distances under rails and supported on loose stones or gravel or earth or what not can never be expected to furnish a construction that will not need a great deal of maintenance if subjected to heavy traffic. Such maintenance results simply because the ballast and ties do not spread the loads over a sufficient area to prevent settlement.

The first and fundamental of street car track construction is a foundation of adequate strength to spread the load over a sufficient area of the subgrade so that the bearing power of that subgrade will not be exceeded. This is especially necessary where track is in paved streets. Sometimes with exceptionally favorable subgrade conditions such a foundation can be had by the use of the ordinary wood tie and ballast, but in paved streets such construction can be justified only where previous experience has shown it to be adequate. Even then it may not prove successful because of increased loads and unusual weather conditions.

No marked increase in weight of cars or of wheel concentrations may be expected in the near future, but the load placed upon the pavement and, hence, the track by trucks is another matter. Ordinarily, street car tracks are not laid in boulevards, from which heavy trucks are excluded, but in those streets that are open to them. The loads on motor truck wheels often exceed those of the electric cars. Many city and state regulations for the design of bridges require the design to be made for 20-ton trucks with 80 per cent of the load concentrated on the rear axle. It is easy to see that 16 tons on a motor truck axle produces more load on a car track than does a 40-ton car whose weight is distributed among four axles. Moreover, when motor trucks cross tracks there is always a bump that greatly increases the load effect on the track substructure. This substructure must therefore carry not only the electric car loads but also the greater ones of motor trucks.

Rigidity and Strength Necessary

A corollary to the need of adequate strength in the track substructure is rigidity. Regardless of who maintains the paving in the car track zone, sound engineering demands that there be no movement in the car track sufficient to destroy the paving. Rigidity, therefore, results from satisfying the fundamental of adequate strength and is also necessary for preservation of the pavement. It has always seemed to us that whatever disadvantages attend the use of a strong, rigid type of car track construction must be put up with in so far as they cannot be mitigated without violating the fundamentals of strength and rigidity.

Noise and rail corrugation have been charged to rigid construction. Testimony as to how much of these objections are chargeable to rigid track is conflicting. A low, steady rumble can be scarcely less objectionable than the metallic bang at low joints, the squeak of brakes, grind of the gears, the clang of wheels set in vibration by sidewise swings against the rails. So long as there are metal wheels on metal rails and a volume of air between the car floor and pavement surface there will be noise. If this noise merely changes to a deeper tone, lower in the pitch scale, it does not become more objectionable on that account.

Rail corrugation has sometimes been

*Abstract of a paper presented at the summer meeting, Central Electric Railway Association, Detroit, Mich., June 29-July 1, 1927.

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charged to rigid construction. However, such evidence as we have does not support this conclusion. Corrugation occurs without apparent rhyme or reason —sometimes on ballast supported track, sometimes on rigidly supported track. Very often it is worse at rail joints. Whether corrugation is started by very small ridges in new rail left by the rolls or whether it is started by vertical vibration or bumping of the wheels along the rails induced by something other than surface imperfections of the rail is a moot question. Perhaps the answer will be found in unsprung loads of equipment or in the car wheels themselves. Perhaps the application of brake shoes to the tread of the wheel produces flat spots that induce corrugations.

In the light of the fundamental requirement of stability in car track construction, such features as ties, rail joints, joint filler, etc., become details, important of course, but always dependent for their successful use on their addition to the strength of the track structure.

When an engineer designs the foundations for a bridge or building he gets together all available information about the bearing power of the material that must carry the structure and then easily works out the width and depth of the foundations from the load they will have to carry. Do we design a street car track structure in the same way? Of course, the problem of how wide the base of a street car track should be depends not only on the bearing power of the subgrade but on the loads and their distribution longitudinally as well. If we knew these things for a given case the design would be simple. We believe that this association, in order to be of most service to its membership, should have a committee investigate and report on the design of street car track structure from a theoretical and practicable standpoint.

Some Problems of the Track Organization*

By W. F. Graves
Chief Engineer Terre Haute, Indianapolis & Eastern Traction Company

ONCE a track is constructed in a paved street its maintenance resolves itself into one of paving maintenance. Concerning the type of track which is best suited for use in paved streets there is as much divergence of opinion as there is divergence of types. Some believe in a foundation which may absorb shocks of moving loads, others in a type that is as near rigid as a monolith can make it. Some engineers are advocates of steel ties, combinations of steel and wood, concrete, etc., and many more of a substantial wood tie. I do not believe the design of modern types of track has advanced a great deal over those in use many years ago. In the United States Patent Office there are filed 895 patents on substitute ties of various kinds. Of this multitude three or four are being marketed, commended by some and condemned by others. The rail for track in paved streets has been fairly well standardized already by the A.E.R.E.A. and American Railway Engineering Association during the past five years. Of the grooved girder type the American Electric Railway Association has several very excellent standards, but while the work of the way committee of that association was being done on these standards, a period of perhaps five or six years elapsed, and in that time came the practical disappearance of the horse-drawn, steel-tired vehicle, which had a very large influence in the adoption of the grooved girder rail design. The growing preponderance of automobile rubber-tired vehicles made the practicability of those designs of questionable value. Also the perfection of concrete pavements, the very much more desirable type of joints on the T type of rail and elimination of opposition on the part of the public to the T-rail led many larger properties to use the low T-rail instead of the more expensive grooved girder rail.

Throughout the Middle West most of the large city street railway properties are also operating interurbans. The tendency of street car design is toward lightness but owing to necessary high speeds the weight of the larger interurban cars has changed very little. In fact, in some localities the introduction of sleeping, parlor and dining cars has tended to increase the weight. But the track foundation, rail design and particularly the design of special trackwork has undergone very little change, and we track engineers and, I might add, the managements, of these street and interurban properties are apathetic toward this situation. There is even a tendency to go to the lighter types of track in paved streets, probably due to first costs. These remarks are particularly applicable to the territory of the Central Electric Railway Association.

Relief from Paving

There is a tendency among state and municipal authorities to relieve the electric railways of the burden of paving the track space; in fact, on our property we do no paving of any nature and only maintain a reasonable surface where necessary to make repairs on account of track troubles. This paving matter has been the subject of many bitter controversies with the municipalities, but we have maintained a firm stand in spite of any provision to the contrary in our original franchises, which were surrendered when taking advantage of the public utilities indeterminate permit act in Indiana, and in all our contact with the public, public bodies, chambers of commerce, city councils, etc., we have taken pains to make our problem perfectly clear, and I believe in almost every case have convinced them of the injustice of the paving burden on the railways. Many court decisions have recently been rendered on this subject, mostly favoring such relief. Attention is called to an article in *Aera*, on page 507 of the May, 1927, number, which contains a digest of recent court actions. But the Supreme Court of the United States in a recent decision concerning the Fort Smith Light & Traction Company of Arkansas, in a paving case, rather took the opposite stand.

We advocate no particular type of paving, but construct the track which we feel is best suited for railway purposes and not paving, except that we do advocate concrete track foundation. A large part of the time of the speaker and of the general superintendents, general manager and general attorney is taken up with the various municipalities combating the imposition of this extra tax and trying at the same time to maintain, at least, a respectable feeling toward us.

Unfortunately in many cases the railways oppose public improvements without sufficient excuse, and some municipalities cannot help wondering why we can and do reconstruct track in the neighboring town and not in theirs. This feature is sometimes hard to explain, and as we are usually on the defensive in these matters, we sometimes make ourselves ridiculous. The important answer is always to maintain friendly and frank relations with the public and public bodies.

Improving Labor Conditions

Much may be said of the relations with the labor employed in maintenance of way and construction departments. The ideal track organization for both street and interurban railways is sectionalized; that is, the property is divided into small units, each with the proper number of men and proper supervision so that the foreman or supervisor becomes familiar with the smallest detail of his unit, as it is the small troubles with both track and overhead that annoy the operating departments. Any work of major proportions to be taken care of by floating extra gangs. Coupled with adequate supervision on up the line, this makes for smoother and more efficient operation and has a marked tendency to be pleasing to the general public by lessening the cause of noise, dust delays and other complaints, which are all too numerous. I can assure you that in these days of keen competition and too much transportation good public opinion looms large.

As to efficiency in the track maintenance organization, excessive labor turnover due to tearing down in the fall and building up in the spring is a large factor. As to labor output per man it

*Abstract of a paper read at the summer meeting Central Electric Railway Association, Detroit, Mich., June 29-July 1, 1927.

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would be both economical and tend to efficiency and individual interest to maintain throughout the twelve months a regular and trained force of men and supervisors, as the training each year of new and untried men is a matter of serious financial cost, but unfortunately not susceptible of being shown in dollars and cents.

Another thing which would make for economy and efficiency would be the grading of rates of wage. Under the present general practice a man starts as a track laborer at a fixed starting rate of wage. At the end of the term of service he is still at the starting point, regardless of his interest in or ability to do the particular work assigned to him, unless perchance he, through push, personality or favoritism becomes a foreman or supervisor. We are too apt to consider labor as a purchasable commodity. But each of these men is a force in his own community and can make friends for the corporation or otherwise as he is satisfied or dissatisfied, and it is particularly among this class from which the majority of our revenue comes.

On our property the grading of the rate of wage is based not only on length of service but on efficiency and output. Giving continuous employment throughout the year would result in an estimated increase in payroll of $12,000 or 5½ per cent, which might be applied to the cost of training men and obtaining loyalty and efficiency. We reward our foreman and supervisors each year with a small bonus, based on an annual inspection by the general officers, to which we devote three or four days. This inspection is of considerable value in acquainting the general officers with what has been going on during the year as well as permitting the men to become acquainted with the officers and what they have been doing, but there is no reward or recognition of the rank and file except an inherent pride in doing a thing well enough to warrant bringing recognition to his foreman or supervisor, and we are now working on a system that we hope will overcome this fault.

Minimizing Street Dangers

Another thing is the safety of our track employees. Accidents are in large measure due to excessive labor turnover. A couple of years ago we began teaching and preaching safety at our trackmen's meetings, of which we have one each month on each divison, and a supervisors' meeting twice a month. These meetings were attended by the claim agent and addressed by him, with the result that the track department showed a decrease in accidents of 30 per cent from the preceding year.

Our property being mostly interurban, our men are not so subject to street accidents, but even in the cities in which we operate the men suffer, some from being struck by passing automobiles in spite of precautions to protect them, such as red lights, flags and on busy streets a watchman maintained to warn the workers. The marked reduction in accidents is directly the result of the teachings in these trackmen's meetings and constant surveillance on the road.

Co-operation and interest should be maintained among the men and it is really surprising how readily they respond to a little individual attention and recognition. Their loyalty is fostered and strengthened. They like to know in a general way what becomes of their daily reports, tool inventories, various individual reports and complaints, the operation of other departments with which they come in contact, how and why they have so many accounts and job or work order numbers to do with. Once each month a meeting of the division foremen is held at the supervisors' headquarters and twice each month we bring the division supervisors to Indianapolis, give them all a luncheon and usually discuss track and maintenance subjects. These meetings are attended at specified times by the auditor, the general and division superintendents, and the claim agents. Matters common to those departments are fully and freely discussed as well as track matters. We also have joint meetings between the line and track supervisors. We conduct also a school of applied electricity presided over by a professor from Rose Polytechnic Institute, which has been largely attended because it is conducted in language the layman can comprehend. By these meetings we believe we have raised the morale and interest of the men.

Distribution of Costs on Automotive Equipment*

By M. Zass
Assistant Superintendent of Rolling Stock
Milwaukee Electric Railway & Light Company

TO BE proper an automobile and motor truck accounting system must necessarily accomplish two things: First, it must provide for the accurate and simple accumulation of all costs of operation; second, it must provide a means of properly distributing such costs over the various accounts which have received the benefit of the operation of the various pieces of equipment.

In order that costs can readily be accumulated we should have a special account into which is charged all costs of operation and maintenance of automobile equipment. So that we may know at the end of the month, in general, what expenditures have been for, and thus gain better control of the account, as well as aid in the management of the maintenance and operation of the fleet, the costs should be classified into several components of similar nature. For ordinary operating conditions the following divisions ought to be sufficient:

1. Superintendence.
2. Maintenance and Repair of Equipment.
3. Gasoline and Oil.
4. Tires and Tubes (replacements and repairs).
5. Cleaning and Washing.
6. Tools and Miscellaneous Expense.
7. Power, Light, Heat, Water, etc.
8. Maintenance of Buildings, Fixtures and Grounds.
9. Fixed Charges.

These divisions of the automobile special account are merely arbitrary and can be added to or combined as local conditions and the size of the fleet may require. For each of the divisions which we find necessary and expedient to make, we should, of course, carry a sub-account, so that charges for labor and materials can be properly classified and allocated.

Sub-account No. 1, Superintendence, is rather self-explanatory. To this sub-account should be charged all supervisory labor, such as garage foreman's salary, assistant foremen, clerks, stenographers, timekeepers, etc., and office expenses. Where the fleet is small, naturally the supervisory force is likewise small, and in some cases perhaps only a portion of one man's time would be properly chargeable.

Charges to Maintenance

Into Sub-account No. 2, Maintenance and Repair of Equipment, should be charged all labor and material expended in the inspection, repairing and overhauling of equipment. This subaccount will, undoubtedly, show the bulk of the total cost in the account, and if further refinements are desired it may be split up to show, for instance, cost of engine and chassis repairs, body repairs, painting, etc. This is entirely optional and local conditions and size of fleet again govern.

The purpose of the next five classifications, namely, No. 3, Gasoline and Oil; No. 4, Tires and Tubes; No. 5, Cleaning and Washing; No. 6, Tools and Miscellaneous Expenses, and No. 7, Power, Light, Heat, Water, etc., are so self-evident that they perhaps do not require any further detailed explanation.

Sub-account No. 8, Maintenance of Buildings, Fixtures and Grounds, should be charged with the maintenance of garage buildings and equipment usually considered a part of the building, such as the heating plant, steam, water and air piping, plumbing, etc. If the building is owned, a rental charge should be set up, and if the building is a rented one, then, of course, the rental cost should be charged to this account. If the building is owned, the rental charge set up should be adequate to cover in-

*Abstract of paper presented before a meeting of the accounting section, Wisconsin Utilities Association, Green Bay, Wis., June 17, 18, 1927.

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terest, depreciation, taxes and insurance on the building. If it is a rented building, then the rent paid, naturally, covers such fixed charges.

Sub-account No. 9 covers fixed charges. This has reference to fixed charges on the automobile equipment only, and not on buildings, fixtures and grounds, as covered in the previous sub-account. Under this title of "Fixed Charges" are included:

(a) Interest on the investment.
(b) Depreciation.
(c) Taxes.
(d) Insurance.
(e) Injuries and damages.

Thus far we have an outline of an automobile special account that would give us a cost of a fleet of automobiles and trucks divided into nine general subdivisions or classifications indicating the nature of the expenditures made. With the operation of but a fleet of cars all of the same make and capacity it would be a relatively simple matter to determine the average cost of operation and maintenance per car, either on the basis of cost per mile or cost per hour or per day. But where we have more than just a few pieces of equipment, we will usually find a number of different kinds and capacities of automobiles and trucks, each best suited for the particular kind of work for which it is especially required. This, then, makes our accounting problem more complex, and especially so where there are a large number of different kinds of equipment.

Allocating Maintenance Costs for Individual Equipment

It is necessary, for a number of reasons, to know what it is costing us to operate and maintain a certain piece of equipment, or a group of certain similar kind of equipments, and our special account must produce this information. In order that this may be accomplished, it will be necessary further to subdivide our special account so that a cost will be found for each vehicle, or each group of vehicles of similar make and capacity. With a small fleet of cars it can readily be arranged to show the cost of each individual piece of equipment, and, where this is done, the results should prove, over a period of time, a good index as to whether or not such a vehicle is economical to continue in service, or whether it should be scrapped or traded in for new equipment. This will work out all right with a small group of cars, not exceeding 25 or 30. Where the number of cars is greater, this method becomes somewhat cumbersome because of the large number of sub-accounts and the resultant amount of clerical work necessary to the detail posting.

In a large fleet there will usually be found a number of similar make and size of vehicle which may be grouped together, and we can arrange our account to show a cost for a certain group of similar cars or trucks, rather than for each individual car or truck. It is very true that some particular unit in a group, by reason of age or condition of service, may cost more or less to operate than others in the same group, and by keeping a group cost, we lose the advantage, previously pointed out, of being able to determine the operating efficiency of a particular unit. However, where a large fleet is operated, some other means is usually provided by which the operating efficiency and economic life may be determined. From the accounting standpoint, and for the purpose we have in mind, it should be sufficiently accurate to use an average cost of a group of cars or trucks. Such an average cost would be determined either on a mileage basis and expressed as a certain cost per mile operated or it may be determined as a cost per hour or per day operated. Whatever method is used is contingent to some extent on how we intend to make our distribution of costs, and that leads us into the consideration of the second requirement of our special account mentioned at the beginning of our paper, namely, that it must provide a means of properly distributing costs over the various accounts which have received the benefit of the operation of the various pieces of equipment.

Distribution of Items in Special Accounts

There are several methods by which the accumulated costs in our special account may be distributed over the accounts which are properly chargeable and which received the benefit of the operation of the equipment.

Theoretically, our object should be to distribute exactly all costs of operation and maintenance into the various accounts receiving the benefit of the service rendered by the equipment and in exact proportion to the amount of service rendered. This would be ideal, but it would require entirely too much bookkeeping and clerical work to accomplish. We must, therefore, find a more simple way of doing this and yet have the ultimate results reasonably correct.

One method would be to distribute the costs as an overhead. While this method may be the easiest one to do, it is by far the least accurate or desirable and is not recommended.

Another method would be to distribute the costs on the basis of cost per mile operated. This is a great improvement over the previously mentioned method, but it still has some undesirable features, as, for instance, take two trucks of similar make and capacity. The cost of operation and maintenance would naturally be very nearly the same for each truck, and consequently the rate per mile at which the service of these trucks would be charged out at would, likewise, be the same for both trucks. One truck may be assigned to a job on which it would be employed continuously throughout the day but would make but very little mileage, while the other truck would be assigned to a job on which considerable mileage is made. It will be seen, then, that if the use of the trucks were charged out on a mileage basis, the charge for the use of the one truck making the small mileage might be considerably under the actual cost, while the charge for the other truck might be too high.

A more equitable method of distribution will be found in the hourly or daily basis, making a charge of so much per hour or so much per day for the use of the automobile or truck. This is by no means proposed as an absolutely accurate and perfect method, as it can be argued that such costs as repairs, gasoline and oil, and tires are governed entirely by mileage actually made by the vehicle. On the other hand many of the other component costs in our special account are measured on a time basis. Trucks hired on the outside are usually charged for on the hourly or daily basis and, all things considered, I believe you will find the hourly basis as the one most satisfactorily serving the purpose.

The determination of the rate per hour to be charged for the various pieces of equipment is perhaps the most difficult thing in the whole proposition. To obtain a reasonably accurate figure it is necessary to use at least a year's cost figure as a basis where possible. If you have decided to keep your costs by groups of similar equipment, then, of course, the total cost for the whole group should be the basis for determining the cost per hour and such a cost per hour would apply to each vehicle in the group whether it be new or old.

Hour Rates Should Be Checked Periodically

The rates per hour ought to be checked at least every six months to determine whether they are adequate to cover actual costs and to adjust any rates which may be found to be either too high or too low, the idea being, of course, that the charges made for the use of the automobiles and trucks, and which are entered as a credit in the special account, will be sufficient to balance the charges for operation and maintenance. It is impossible, of course, to balance the charges exactly each month for the reason that some months may show rather high maintenance charges due to considerable overhauling work, or other reasons, while other months may be lower, while the charges for the use of the trucks (which would appear as credits in the special account) would be a fairly constant figure, as it should be.

There is but one thing further that the accountant will have to have to complete the mechanism of this special account and that is a monthly report or statement from the operating department which will indicate the number of hours each truck or automobile was used and the particular work or job on which it was used, together with the charge account number for such work, so that the proper completing entries may be made. The form and manner in which this information is gathered will have to be left to you, as conditions and circumstances on your properties will govern the method used.

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1,500 at New York Railroad Club Outing

BASEBALL, golf, tennis, running and track events occupied the attention of nearly 1,500 persons who took part in the annual outing of the New York Railroad Club on June 30 at Travers Island, N. Y. A special train on the New York, New Haven & Hartford Railroad took members to the grounds of the New York Athletic Club. A buffet lunch was served on the arrival of the train and in the evening over 1,000 persons enjoyed a shore dinner.

The electric railways in the New York district were well represented in the delegation. William G. Gove, president of the Railroad Club, being an electric railway man naturally drew out a good representation of his associates. Those who played golf went out early in the morning and played at the Wing Foot Golf Club at Mamaroneck until noon. Rain in the morning dampened the clothes of some of them, but did not dampen their ardor. The baseball game, which started at 2:30 p.m., was won by the publicity department team of the New York Central Lines. Their opponents were a team from the New York *Times*. Sixty-one men entered seven track events and several heats were necessary in almost every event. Perhaps the most hotly contested event of the day was a meeting at quoits between Frank Hedley, president of the Interborough Rapid Transit Company, and W. S. Menden, president of the Brooklyn-Manhattan Transit Corporation. It was reported that the B.-M.T. president was in the lead when the game was adjourned for dinner.

Model for Municipal Traffic Control to Be Drafted

PREPARATORY to drafting a model municipal traffic ordinance eighteen members of a national conference representing all classes of highway users, as well as enforcement officials named by Secretary of Commerce Herbert Hoover, met in Detroit on July 6. The movement was instituted on June 17 last when William E. Metzger, Detroit, was appointed chairman of the National Conference on Municipal Traffic Problems. The purpose of the meeting was to name chairmen and vice-chairmen, and to advocate work to be carried on during the summer months. Active work toward the preparation of the code is to be carried on through six sub-committees, each of which will draft sections of the code pertaining to specific subjects for discussion the latter part of the year at a meeting of committee chairmen in order to eliminate duplication in recommendations. After this meeting the reports will be published in tentative form for constructive comment by interested parties. In addition to suggestions for wording of the various sections of the ordinance, these reports will contain much information that can be used for educational purposes in helping to stimulate interest and show the necessity for the recommendations made. This educational work can be of much help in showing the necessity for uniformity in handling local traffic in widely separated cities even though within the same state.

Special study will be given to the question as to the extent to which exact or substantial uniformity in the traffic provisions is possible and desirable, and in what features of the traffic ordinances and regulations there must be flexibility to meet local conditions. Other questions to be considered pertain to what matters should be left to the state law and what should be covered by neither state law nor municipal ordinance but by supplementary regulations that can readily be changed as traffic conditions require. Chairmen and vice-chairmen of committees named are:

Vehicle Movement and Regulation, Dr. Miller McClintock, Cambridge, Mass., chairman, and H. D. Brown, Detroit, vice-chairman.

Pedestrian Facilities and Regulation, James L. Madden, New York, chairman, and C. W. Stocks, New York, vice-chairman.

Traffic Signs, Signals and Pavement Markings, W. B. Powell, Buffalo, chairman, and B. W. Ryark, Chicago, vice-chairman.

Parking Terminals and Garages, Robert E. Hooper, Philadelphia, chairman, and F. L. Wetland, Cleveland, vice-chairman.

Public Motor Vehicles, Including Street Cars, Buses, Taxicabs and Fire and Ambulance Emergency Vehicles, A. C. Godward, Minneapolis, vice-chairman.

Traffic Organization and Enforcement, S. J. Williams, Chicago, chairman, and G. W. Elliott, Philadelphia, vice-chairman.

Electric railway men named include E. J. McIllraith, staff engineer Chicago Surface Lines, on the committees on traffic signs, signals and markings and on parking, terminals and garages; R. J. Senter, president Philadelphia Rapid Transit Company, and H. B. Flowers, president New Orleans Public Service, Inc., on the committee on parking; Lucius S. Storrs, managing director American Electric Railway Association, and Arthur M. Hill, secretary and treasurer Charleston Interurban Railroad, on the committee on buses, street cars and emergency vehicles.

American Association News

Engineering Nominations

NOMINATIONS for officers of the American Electric Railway Engineering Association for the association year beginning October, 1927, have been made by the nominating committee as follows:

President—R. H. Dalgleish, chief engineer Capital Traction Company, Washington, D. C.

First Vice-President—Frank H. Miller, vice-president and general manager Louisville Railway, Louisville, Ky.

Second Vice-President — Willard F. Graves, chief engineer Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Third Vice-President—W. W. Wysor, chief engineer United Railways & Electric Company of Baltimore, Baltimore, Md.

Secretary-Treasurer—J. W. Welsh, executive secretary American Electric Railway Association, New York, N. Y.

Members of the Executive Committee—L. D. Bale, superintendent of power Cleveland Railway, Cleveland, Ohio; Charles H. Jones, general manager Chicago, South Shore & South Bend Railroad, Michigan City, Ind. P. V. C. See, superintendent car equipment Northern Ohio Power & Light Company, Akron, Ohio; F. McVittie, electrical engineer New York State Railways, Rochester, N. Y.

The report is signed unanimously by the nominating committee, consisting of Charles R. Harte, A. T. Clark, H. H. George, H. A. Johnson and C. A. Smith.

Wood Preservation

ON JUNE 8 a meeting of the committee on wood preservation of the Engineering Association was held at association headquarters in New York. The following were present: C. A. Smith, chairman; W. H. Fulweiler, E. F. Hartman, M. J. Curtin.

The report of sub-committee No. 1 on "Review of Existing Manual Sections for Revision and Correction" recommended a number of changes in Manual Section WP120-26. Other changes were recommended in Manual Sections WP106-26 and WP104-26. A new specification for the open-tank treatment of poles will be submitted. The committee approved the entire sub-committee's report. Progress reports of each of the other sub-committees were considered and commented upon. In some cases suggestions for changes were made and these will probably be incorporated in the final report.

Metro Section Will Go to Luna

WHEN the third annual outing of the Metropolitan Section, A.E.R.A., is held on Tuesday, Aug. 16, one of the features of the program will be an evening trip to Luna Park, Coney Island. Members of the section will be guests of Barron Collier at the park. Athletic events will be held during the day at the grounds of the Crescent Athletic Club, Bay Ridge, Brooklyn. The program includes an eighteen-hole golf putting contest at 9 a.m. and other events during the afternoon. There will be a hundred-yard dash for thin men, and a fat man's race for those weighing 220 lb. or more, a tug of war between the railway and supply men, a hop, skip and leap competition, as well as wheelbarrow and sack races. A baseball game will be played between the railway men and supply men. Old timers can amuse themselves pitching quoits. Dinner will be served at the club at 5:30 p.m. After distribution of the prizes for the athletic events, transportation will be provided from the club grounds to Luna Park.

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News *of the* Industry

Chicago Still Hopes

City Council calls first meeting to speed new plans for traction settlement —Need for temporary grant

Willingness of both local transportation executives and city officials of Chicago to accept the offer of Governor Len Small to call a special session of the Illinois Legislature next fall if the city and companies can agree on an ordinance and the kind of legislation they want was indicated during the week commencing July 5 by the response to a call issued by Chairman Joseph B. McDonough of the City Council local transportation committee to begin work immediately on a new traction settlement program.

Realizing that the only hope for the bills lay in the support of the Governor, proponents of the measures turned to Governor Small at the eleventh hour. He expressed the belief that the enabling legislation is needed, but refused to make any promises about a special session. He appeared to desire a public referendum on the question of franchise duration in advance of the passage of the indeterminate permit bill, instead of after the legislation was obtained as proposed by the companies.

With the 33 amendments attached in the House committee on municipalities, it is understood that the bills were no longer acceptable to the Chicago transportation companies. Representatives of the surface and the elevated lines had not been at the capital since June 25 and in the closing hours of the session no one in the House or among those who backed the bills seemed concerned with their progress.

The program which will probably be followed in the new negotiations will first require that the city and companies come to a full agreement on the fundamental principles of a settlement. Following this, an ordinance will be drafted and submitted to the voters for a referendum with the explanation that if they approve it the enabling legislation will be obtained. The purpose behind the recently defeated company bills was first to obtain this legislation before negotiating an ordinance.

Further evidence of the desire of traction officials to co-operate with the city in working out a plan to take the place of the lost bills was revealed in a letter dispatched on July 1 to holders of the Chicago City & Connecting Railway collateral bonds by B. E. Sunny, chairman of the protective committee.

"The demand for a settlement," said Mr. Sunny, "is so universal and urgent as to amount to a guarantee that a new program of procedure will be promptly arranged."

The letter also informed the security owners that pending settlement of the $39,458,000 principal of the first mortgage bonds of the Chicago City Railway and Calumet & South Chicago Railway, which has been in default since Feb. 1, dividends on the companies' stock will not be paid.

With only a little more than three weeks remaining before the six-month franchise extension granted last February to the Chicago Surface Lines, anxiety is again being expressed for the future of the lines. It is considered probable, however, that a new extension for six months will be granted on terms similar to the one now in effect with either the city or the companies having the right to terminate it upon 30 days notice.

New Ordinance to Be Drafted in Toledo

Terms of operating agreement, long under negotiation, are referred to committee of Council for drafting— Many changes made in Milner grant

SUBSTANTIAL concessions affecting the capital account of the Community Traction Company, Toledo, have been agreed to by the Henry L. Doherty & Company group in an effort to provide a basis for a new exclusive railway and bus franchise for Toledo.

The general plan of the present Milner service-at-cost ordinance will be followed, but numerous important changes which are aimed to provide better streets, improved service and which may lead to more reasonable fares are included in the recommendations.

$1,300,000 of New Money

The greatest concession made by owners of the property is the bringing in of $1,300,000 of new money against which no securities will be issued. Of this amount $1,050,000 will be required for carrying out the Riggs plan of rehabilitating, rerouting and building up the entire system of co-ordinated bus and railway service, $50,000 will be for added working capital and $200,000 will be placed to the credit of the stabilizing fund.

In addition to this new capital the Community Traction Company will be relieved of $400,000 of floating debt which was incurred when the management borrowed funds to pay interest on outstanding bonds and $240,000 of accumulated dividends on preferred stock. Dividends on preferred stock sold to small investors in the city will be paid regularly under the basis of settlement. These dividends have been paid in the past by Henry L. Doherty & Company, which has taken up receipts pending the resumption of dividends.

The deficit in the stabilizing fund is slightly more than $1,000,000. The effect of the new arrangement will be to relieve the fund of $640,000 of debt, provide $200,000 in cash and $50,000 of new working capital, or a total of $890,000. This, together with possible adjustments in the power contract, would start the new franchise off with a clean slate.

Under present conditions and the new basis of settlement the company would begin with $6,594,000 of 6 per cent bonds outstanding and $96,000 of 8 per cent preferred stock in the hands of the public. However, $140,000 more of bonds will be retired through sinking fund on July 31. This will further reduce the amount of earnings to be applied to capital charges. Under the change proposed in the ordinance interest on retired bonds would not have to be paid into the sinking fund. This has been a big drain on current revenues.

In return for all these concessions the company will be granted an exclusive franchise for ten years and with renewals possible in ten-year periods, together with a final fifteen-year amortization or city-purchase plan as provided under the Milner ordinance. The exclusive privilege shall apply only to the territory in the city adequately served by the company and all territory within ½ mile of any transportation line shall be considered adequately served. Strengthening of the forfeiture clause to cover both bus and railway service is provided.

The Board of Street Railway Control will have added powers of right of inspection, with reasonable discretion to be used by it in approval of terms of contract respecting wage scales and major purchases of equipment, materials and supplies. These rights it must exercise so as not to interfere with the expeditious operation.

The company is also required to prepare and submit to the board an annual budget in which yearly earnings and expenditures are to be estimated.

The $1,300,000 to be provided by the management is not to be capitalized and it must not be amortized or ever considered a liability. However, the $400,000 from which the company is to be relieved is to be funded in the event that the franchise is renewed and extended, without interest and paid without interest at the rate of $16,000 a year. No such payment is to begin earlier than ten years from the date of the proposed new ordinance.

The basis of settlement has been referred to the rules, by-laws and ordi-

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nance and railroads committees of City Council and the city authorities will now proceed with the work of drafting the ordinance. It is not considered possible that the measure will be ready to submit to voters for approval for several months.

The terms of the new settlement were negotiated by the Board of Street Railway Control, members of which have had close contact with the operation during more than six years.

Old and New Equipment in Independence Day Parade

The first electric car ever operated on Springfield, Mass., streets, the first bus and the latest type of carrier to be installed, the model car embodying many bus features, were all exhibited in a street parade in that city July 4. The occasion was to celebrate the 75th anniversary of the incorporation of Springfield as a city.

You May Be Victimized Next!

An impostor is at work in the electric railway field. Part of the time this man has been using the name of Walter A. Draper of Cincinnati, and so glib is the story he tells that he has succeeded in victimizing a number of people in the electric railway supply field. His story is a plausible one and the manner of the man carries conviction. In one of the cases in which he operated in New York, the impostor represented himself as a friend of a man formerly in the Chicago office of the company he was seeking to victimize. The story he told ran like this:

His wife, her sister and his boy were automobiling from Cincinnati to New York. He alone made the night run from Philadelphia to New York. His family took the train. He was held up between New Brunswick and Metuchen. There everything was taken from him—cardcase, letters, automobile, etc. As evidence that he had been held up he showed his empty pockets. He said he had gone to the police at New Brunswick and reported to them, but had trouble in getting money to come to New York. He threatened to see the Mayor of New Brunswick, as he purported to be well acquainted with the Mayor of Cincinnati. He professed to have made a mistake in not returning to Philadelphia and seeing a prominent official of the P.R.T. whose name he mentioned, or certain equipment people there. His family was due in New York at 5 o'clock. They were to stay at the McAlpin. The burden of his lament was that he would like to be helped out. His promise was that he would return the next day and reimburse the lender. He was profuse in his thanks and extended an invitation to the good samaritan to call on him in Cincinnati.

The man is described as being about 5 ft. 10½ in. high and weighing 170 lb. He is well built, has brown eyes, a rather round face with a complexion slightly red. One of those he victimized described him as wearing a brown suit, a brown hat and a light overcoat. On this occasion there was a gold ring around his tie.

$4,000,000 Job Completed by Long Island Railroad

Interchange of through freight traffic among the Long Island, the Pennsylvania and the New Haven Railroads, by means of electrically operated freight trains commenced on July 8, when electric locomotives replaced steam locomotives in the movement of freight cars from Bay Ridge, Brooklyn, to Port Morris, in the Bronx, via the Bay Ridge division of the Long Island Railroad, and the Hell Gate Bridge Route of the New York Connecting Railroad.

The complete electrification of the Bay Ridge division, between the float or transfer bridges at Bay Ridge and Fresh Pond, is now nearing completion, and within a few weeks the electric operation will be extended to include the entire freight service of the Long Island Railroad on the Bay Ridge division.

In April the Long Island started partial operation with electric locomotives between the New Lots classification yard, located west of East New York, on the Bay Ridge division, and Fresh Pond, and on June 29 a test train was operated between Bay Ridge and Port Morris, with an electric locomotive.

Now all through freight service between the waterfront at Bay Ridge and points on the New Haven Railroad as far east as New Haven, Conn., is operated by means of electric locomotives, eliminating entirely the use of steam motive power between the Long Island Railroad float bridges at Bay Ridge and the existing electrified system of the New Haven Railroad at Port Morris.

The Bay Ridge division of the Long Island Railroad and the Hell Gate Bridge Route of the New York Connecting Railroad serve as connecting links for the interchange of through freight traffic between the Pennsylvania and the New Haven Railroad systems.

Electrification of the Bay Ridge division covers more than 85 miles of main track.

Fourteen electric locomotives were purchased by the Long Island Railroad to carry on the electric freight train operations on the Bay Ridge division.

In conjunction with the electrification of the Bay Ridge division of the Long Island Railroad, the New York Connecting Railroad electrified its freight tracks between Fresh Pond and Port Morris, known as the Hell Gate Bridge Route. This is the first step taken by the Long Island Railroad to electrify its freight lines in Greater New York.

The estimated cost of electrifying the Bay Ridge division exceeds $4,000,000.

St. Paul Southern to Be Extended

An extension of the St. Paul Southern Railway from Hastings, Minn., to Zumbrota, 52 miles, is assured by Rice Associates, Minneapolis, which has acquired an option on all holdings of the company. The road now extends from St. Paul to Hastings. It has been operating under a receivership. This will give a new short route to Rochester, Minn., from the Twin Cities, with train service to inland points. To reach Minneapolis existing rail lines will be tapped at Inver Grove, just south of South St. Paul.

Westchester Road in Harrison

The New York, Westchester & Boston Railway's extension of its eastern division to a new terminal at Harrison, N. Y., was completed on July 2 and opened for regular service on July 3. With the opening, Harrison became the eastern division terminal, which since March, 1926, has been at Mamaroneck. For fourteen years prior to that time the terminal was at Larchmont. The joint station nearing completion at Harrison is of permanent fireproof construction and is one of the largest on the line, but it probably will not be a terminal for more than a year, as the Dwight P. Robinson organization, under contract, already is cutting through rock and erecting bridges for a further extension to Rye which will mark another step toward the projected establishment of a permanent terminal at Port Chester, at the Connecticut State line.

Chicago Surface Lines Wage Arbitrations Still in Deadlock

Efforts to break the long-existing deadlock in negotiations for a new wage scale for Chicago Surface Lines employees were renewed at a conference on July 6, but the session was adjourned without any real progress. The men's demands for a wage increase of 15 cents an hour over the present maximum rate of 75 cents an hour, together with $1,000 insurance policies and sick benefits of $20 a week, have been rejected.

Rumors current last week that the Surface Lines was considering a compromise adjustment of 5 cents an hour wage increase with sick benefits were denied by William Quinlan, president of the local union, at the close of the meeting on July 6.

Company officials have indicated a disposition to grant the men's demands for the free insurance and sick benefits, a concession which they estimate would amount to a 2 cents an hour increase, but they have made it clear that a wage increase is out of the question at the present time unless fares are increased.

Officials of the Chicago Rapid Transit Company and Chicago, Aurora & Elgin Railroad and representatives of the 5,000 trainmen of the former and 800 of the latter road who likewise met on July 6 to consider demands for a 15-cent increase in hourly wages, appear to have encountered the same difficulties as the Surface Lines wage conferees. The elevated men were granted free insurance and sick benefits a year ago last month and are now receiving a maximum rate of 77 cents an hour. It is believed that the elevated trainmen, who have also voted strike powers to their representatives, will support the Surface Lines employees in any action taken. Another meeting with elevated officials will be held July 12.

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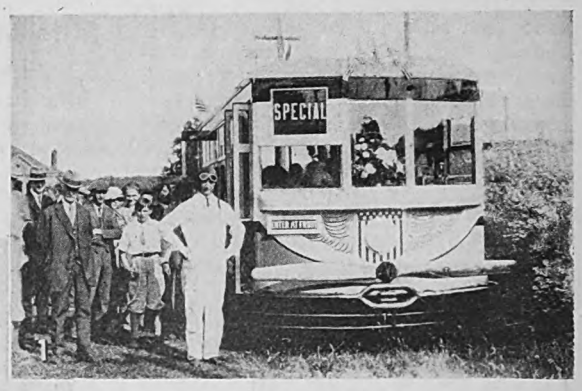
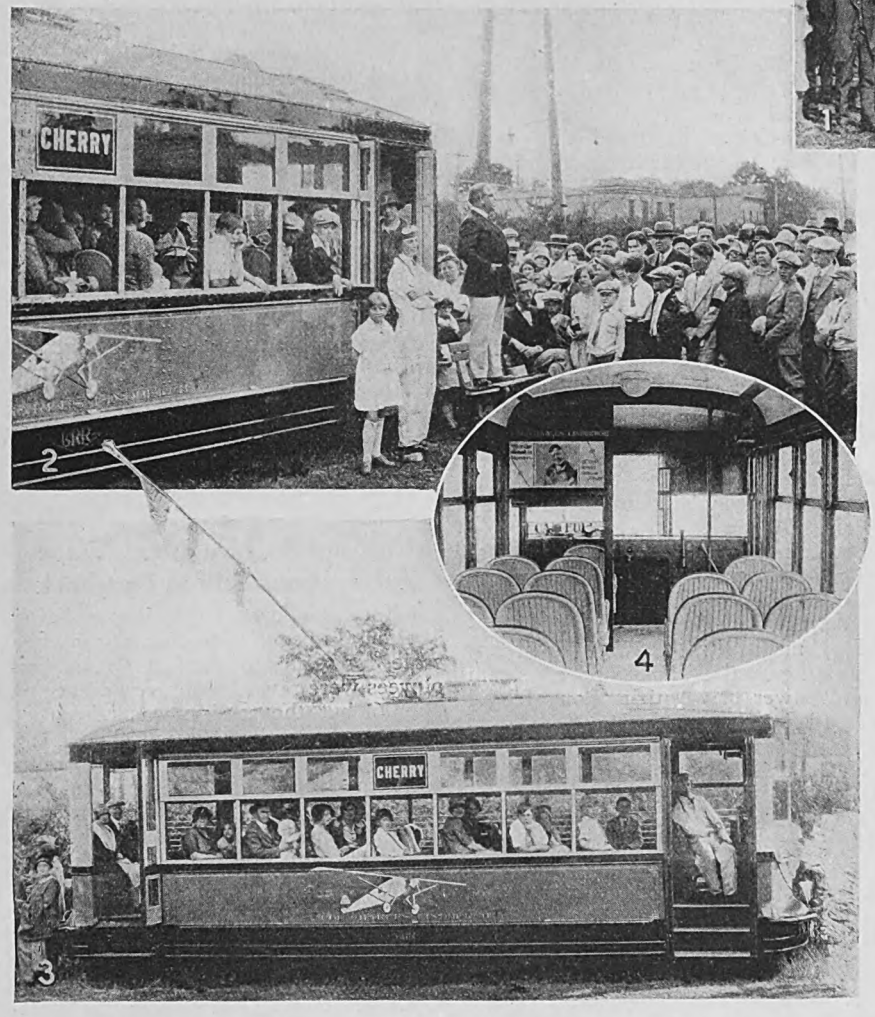
Col. Lindbergh Honored by the Grand Rapids Flying Club





No. 1

Front view of the coach with "Pilot" William Meinke of the Grand Rapids Railway

No. 2

Secretary Bierce of the Grand Rapids Chamber of Commerce speaking at the dedication of the Lindbergh coach

No. 3

Broadside view of the Lindbergh rail coach

No. 4

Front interior view of the Lindbergh coach taken in the shop

No. 5

Dense crowd at the dedication address indicating the interest of the listeners in the Grand Rapids Railway's celebration

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Coach at Grand Rapids Named After Col. Charles Lindbergh

Public ceremony attends dedication of car to flying colonel by Michigan railway. The historic vehicle now in active service

IMMEDIATELY after Col. Charles A. Lindbergh made his historic flight across the Atlantic Ocean L. J. DeLamarter, vice-president and general manager of the Grand Rapids Railway, Grand Rapids, Mich., conceived the idea of a timely dedication of a rail coach in honor of the colonel. This thought was conveyed to the officers of the Grand Rapids Flying Club, in the belief that in the spirit of aviation the club's efforts to gain greater public support of the local airport could be realized and also that the public ceremony which would attend such an event would not only be fitting but profitable. The club agreed. Accordingly a request was made by the Flying Club, through its president, Carl Batts, to Mr. DeLamarter to permit the club to sponsor such a coach at a public dedication. Immediately Mr. DeLamarter ordered a new rail coach built by the company's workmen in the company's shops and it was equipped, painted and completed in record time. Then came the public dedication of the coach on Sunday, June 19, in honor of the New York to Paris flier.

News stories and advertising informed the public of the event, held at the railway's amusement park loop at 5 p.m. This hour was chosen so as not to conflict with a public band concert in John Ball Park, at which, during the afternoon, the Elks band played for the first time in Grand Rapids the selection "Spirit of St. Louis," dedicated to Colonel Lindbergh. At 2 p.m., however, the Lindbergh rail coach was placed on public exhibition and inspection on the loop. More than 3,000 persons passed through it during the hours until the dedication, in spite of the counter attraction at the other park.

In the dedication speech, delivered by Mr. Batts, he sponsored the coach in behalf of the Grand Rapids Flying Club and thanked the railway for its cooperation in aiding both the local airport and the club by building the coach.

Lee H. Bierce, secretary of the Grand Rapids Association of Commerce, was introduced by Mr. Batts as the principal speaker. He made an inspiring talk on Colonel Lindbergh's achievements and praised and thanked the railway for its enterprise in being the first city to dedicate a railway coach to the flying colonel. He said that news of the coach dedication had been carried to all the leading newspapers of the country by the Associated Press, in addition to which the story was broadcast by the local radio station, WOOD.

During the dedication several thousand people crowded the loop as airplanes from the local airport swooped from the sky and flying low dropped floral tributes upon the attractive coach.

Telegrams telling them about the Grand Rapids coach dedication were sent by the local flying club to Colonel Lindbergh and his mother in St. Louis, Mo., where at that very hour the colonel was being welcomed home. An attractive album of photographs of the event, autographed by Mr. Batts, Mayor Swarthout, Mr. Bierce, Association of Commerce officials and Mr. DeLamarter, was sent to the colonel.

As a feature of the dedication one of the car operators, who will be known as "pilot" instead of chauffeur of the coach, was attired in the regulation one-piece flying uniform with goggles and helmet, in keeping with the atmosphere of the coach.

The new coach harmonizes with the quality of the railway's new equipment. It is made unusually attractive by the outside decorations, which include the name of Colonel Lindbergh and the flying insignia with American shield and gold star signifying a senior aviator. The coach panels are illuminated with artistic reproductions of the famous Lindbergh airplane, "Spirit of St. Louis." An unusual but very appropriate decoration is an 8-ft. airplane propeller that graces the full front of the coach. It is placed on a standard midway between bumper and illuminated dash. Small models of airplanes with revolving propellers are placed at the two front corners of the coach roof, and small American flags adorn the rear.

In the interior of the coach in the bulletin board rack is a crayon portrait of Colonel Lindbergh, with these words in gold letters: "This car named in honor of his world famous flight." Over the portrait in a bulkhead panel in gold letters is this inscription: "This car is sponsored and dedicated to Col. Charles A. Lindbergh by the Grand Rapids Flying Club."

The Lindbergh coach was placed in regular service the day after the public dedication. It is painted in desert sand color, with red and black trimmings, lettering being in gold. The seats are an innovation, being round-top reed, upholstered with leather, with air cushions.

Offer for Bridge Line Made by Philadelphia Rapid Transit

The Delaware River Bridge Joint Commission has received from the Philadelphia Rapid Transit Company an offer to pay to the Joint Commission a toll of ¾ cent per passenger for the exclusive right to operate over the proposed trolley car line on the Delaware River Bridge. The offer was sent by President R. T. Senter of the P. R. T. to General Manager Joseph K. Costello of the Joint Commission.

In the first suggestion Mr. Senter said that if the Joint Commission should issue bonds to cover the costs of construction the railway would guarantee that in each year the total payments for toll should equal interest and sinking fund charges on the bonds. In the second, Mr. Senter said that if the railway were to finance the costs of construction the company would collect the tolls and pay to the Joint Commission the balance remaining after the deduction of 8 per cent per annum and 1 per cent per annum sinking fund, both cumulative, upon the actual costs of construction.

If the latter plan is accepted, Mr. Senter wrote, the company will agree that the Joint Commission shall have the right to take over the track, overhead and carhouse by paying to the railway its original expenditure, less accumulation in the sinking fund, "and substituting the arrangement as outlined above." In either event, Mr. Senter added, the improvements are to become part of the bridge and the property of the Joint Commission, "and the license or lease shall cover the full period until the costs of construction, whether represented by our expenditure or your bonds, are fully amortized through the sinking fund payments named."

The route of the proposed trolley line will be from the loop in the underground station at the Philadelphia bridge plaza, thence over the bridge to Fourth Street, Camden: thence to Mickle Street, to Fifth Street, to Linden Street, to Fourth Street and over the bridge to the Philadelphia station. The round trip length is 4.42 miles.

Suggests City Take Rockaway Lines

Purchase by the city of the Rockaway Beach and Far Rockaway divisions of the Long Island Railroad and the inclusion of these lines in the city's rapid transit system were suggested on June 28 by the Chamber of Commerce of the Rockaways in a letter to John H. Delaney, chairman of the Board of Transportation. The letter declared that the time was favorable for the purchase because the railroad was faced with an expense of millions in eliminating grade crossings on these divisions and set forth three offers to sell or lease the lines made by George Le Boutillier, vice-president Long Island Railroad, in recent talks with members of the chamber.

A letter from Mr. Le Boutillier was quoted to the effect that the Rockaway peninsula was the only part of the city not tapped by rapid transit facilities, although it had a permanent population of 70,000 and a summer population of 250,000, and that its transit service was unsatisfactory, inadequate and discriminating against the residents in the matter of fare. The letter added that the chamber did not ask any stipulation regarding the rate of fare to be charged if the city should take over the lines, and least of all would attempt any agitation that would jeopardize possibility of operation at a profit.

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St. Louis Must Not Invade Commission Territory

The Missouri Supreme Court decided *en banc* on June 27 that the city of St. Louis was without the power to regulate to any extent, directly or indirectly, the rates of a public utility, or to prescribe regulations or practices which affect such rates. This decision was handed down in the test case by Victor Packman and Jesse Bishop, young St. Louis attorneys, who had been fined in the City Court for violation of a city ordinance which prohibits the selling or giving away of street car transfers. The court held this ordinance invalid on the grounds that it invades the province of the Missouri Public Service Commission, which has sole authority to regulate rates and charges and practices of public utilities, including street railways. The ruling reasserts previous decisions by the same court on public utility rate matters. The court, however, held that the city could require individuals in their dealings with the railway to observe the company rules and regulations affecting rates, because of the public interest involved in maintenance of just, reasonable and non-discriminatory rates, but this was the limit of the city's authority.

Service Resumed

After a lapse of two months, service on the Rockford-Belvidere Elgin line of the Rockford Traction System, Rockford, Ill., was resumed on July 2. During the suspension rehabilitation of the line, necessitated by the devastating storm which swept the district in April, was completed. Old lines and poles have been replaced by new ones, new ties laid and several sections of track replaced. The line was purchased from Bion J. Arnold by Milton J. Ellis, Rockford. Some of the eight new cars ordered for the Ellis lines will be placed in service on this property. Interurban schedules will be so arranged as not to conflict with the bus service maintained by the Ellis line along this route.

Contract for Operation Renewed in Minneapolis

The City Council of Minneapolis, Minn., has made a contract for another year with the Minneapolis Street Railway to operate the city's Columbia Heights filtration plant trolley line at a cost of $3,300. This line connects with the Columbia Heights car line of the railway.

Houston People Seek Election on Fare Ordinance

Petitions are being circulated requesting an election at an early date at which the people of Houston, Texas., can vote on the recent ordinance granting an increase in fares to the Houston Electric Company. Under the referendum provision of the Houston city charter the ordinance must be submitted to the voters if petitioned by a certain per cent of the qualified voters of the city. It seems assured that the required number of signers can be secured. Robert Brewer, secretary of the Houston Automobile Club, is in charge of the movement.

Free Service Increases Traffic

It is estimated that 50,000 persons in Springfield and vicinity availed themselves of the free service privilege granted between 9 and 12 o'clock in the morning of July 1 through an arrangement between the Chamber of Commerce and the Springfield Street Railway, Springfield, Mass. The purpose was to promote publicity for store windows exhibiting the products of Springfield industries and also to increase the store trade. Extra receipts on the regular fare basis offset the operating expenses incurred.

Omaha Company States Its Franchise Problem

Under date of June 17 the Omaha & Council Bluffs Street Railway, Omaha, Neb., addressed a letter to the Mayor and City Council directing their attention to the following conditions:

The bonded indebtedness of the company matures on Jan. 1, 1928, and we have been engaged for several months in negotiations for the refinancing of this indebtedness.

We find that it is impossible to obtain the funds to meet these maturing bonds until we receive franchise rights that are unquestioned.

From our negotiations up to this time we have been convinced that a franchise period of 30 years will meet the requirements of investors in this class of securities. This, however, we feel to be the minimum period which would meet their requirements.

We therefore ask that you call a special election for the purpose of submitting to the electors a franchise in ordinance form to be prepared in the manner provided by the statutes of the state.

It is highly desirable, we think, from the standpoint of the city and the car riders, as well as from the standpoint of the company, that the franchise be submitted as long in advance of the maturity of the bonds as careful and orderly procedure will permit.

We shall be pleased to meet with you for discussion and conference when and as you may desire.

It is understood that upon the new franchise becoming effectual we will waive all claims to a perpetual franchise.

This communication was read in the Council meeting on June 21 and referred by that body to the Corporation Counsel with instructions to prepare an ordinance and report it back to the Council at a future meeting.

The hope is publicly expressed by the company that a franchise which will fully protect the rights of the public and at the same time deal fairly with the company may be agreed upon at an early date, in order that the latter may be enabled to serve the community in the best possible manner.

Legal Preliminaries in Boston Explosion Case

Litigations involving the Boston Elevated Railway, Boston, Mass., growing out of a film explosion in the subway on Jan. 3, 1925, are about to start. The case is to be tried before a jury and Judge Williams in the Suffolk Superior Court. The jury has been chosen and the case temporarily suspended. Eighty-eight law suits, with a total damage claim of more than $1,000,000, have been entered as a result of that explosion. The defendants are the Boston Elevated, the Famous Players-Lasky Corporation and John F. Bowditch. At the outset only three cases, brought by one plaintiff, Madeline F. Guinan, are to be tried, on the question of liability. They are test cases.

Films carried by a passenger on a street car exploded in the subway and hurt several passengers. At the time of the accident it was contended that the elevated had no knowledge of the presence of the films in the car and that the transportation was not in conformance with the rules and regulations.

No Decision in Jersey Case

Pending a decision by the Board of Public Utility Commissioners of New Jersey, it is understood the Public Service Railway will not avail itself of its right under the law to put into effect its fare zone adjustment on eleven bus lines and one railway line.

The proposed adjustment of fares was to have been effective as of Jan. 1, but the commission has twice suspended it for three-month periods, which it is authorized to do under the law.

The adjustment in fare zones, it was estimated by Public Service witnesses during the hearings, will bring in additional gross revenue of $600,000 annually. The municipalities affected are Irvington, Bloomfield, Elizabeth, Roselle, Kenilworth, Hawthorne, Clifton, Passaic and Rutherford, as well as Newark. In most instances, the effect of the readjustment in fare zones, if approved, will be to increase fares.

Johnson City Agrees to Fare Increase

The Board of Trustees of Johnson City has approved a written stipulation with the Binghamton Railway, Binghamton, N. Y., agreeing to withdraw the village's objections to the railway's petition for a fare increase providing the company sells four tickets for 30 cents. This provision already had been accepted by the railway. The trustees directed their attorney to withdraw the objections before the Public Service Commission and send that body a certified copy of the stipulation. The fare agreed upon permits a charge of 10 cents for a single ride with four tickets for 30 cents. By purchasing tickets, the fare will be increased one-half cent as the rate now is 7 cents.

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Recent Bus Developments

Shore Line Officials Take Over Carey & Leach Bus Lines

At a meeting of the stockholders of the Carey & Leach Bus Lines, Inc., held in Kalamazoo, Mich., recently, the name of the company was changed to Southwestern Michigan Motor Coach Company. Operation of the company is now under the direction of J. C. Johnson, general manager of the Shore Line Motor Coach Company, who became general manager of the Carey & Leach line several weeks ago. A. B. Carey, who resigned as president and general manager, continues as a member of the board of directors and will serve the company in an advisory capacity. Walter C. Loy of Michigan City, Ind., has been appointed assistant general manager. The Southwestern Michigan Motor Coach Company will continue to operate the same service formerly rendered by Carey and Leach between Chicago and Detroit and between Kalamazoo and Benton Harbor, South Bend and Sturgis.

The Shore Line Motor Coach Company is owned jointly by the Gary Railways and by the Chicago, South Shore & South Bend Railroad.

Jersey Coast Bus Fares Discussed

Commissioners of Long Branch, Allenhurst and Deal, N. J., are objecting to the three 10-cent fare zones which the Coast Cities Railway demanded as the basis of the proposed substitution of buses for the present railway line between Long Branch and Asbury Park. The commissioners favored five 5-cent zones instead. The matter was deferred until a future meeting, when the 5-cent zone proposal is expected to be passed. The railway operates buses south of Asbury Park as far as Manasquan, through Belmar, Avon and a number of other Atlantic Coast resorts, and north of Asbury Park to Long Branch.

Terminal Project Proposed in Providence

Eugene J. Phillips, vice-president of the New York, New Haven & Hartford Railroad, has proposed to the Council of Providence, R. I., a plan for the construction of a bus terminal on Railroad Street, behind the Union station, by the New England Transportation Company, a subsidiary of the railroad, and for the use of this terminal only by the buses of the New England, United Electric Railways, Interstate Limited Motor Coach Company, Newport Electric Corporation, Interstate Buses Corporation and "quite likely" another line operating between Boston and Providence. A clause in the plan provides that companies in the combination be protected against competition in the center of the city by the creation of an area in which all highway motor stops, excepting those of the United Electric Railways, which operates both local railway and bus lines, shall be forbidden. The restricted area is roughly bounded on the east by Benefit Street, on the south by Crawford Street, on the west by Empire Street and on the north by the New Haven Railroad property.

Co-ordination Essential

Minnesota state body passes upon fares and comments on the need for unification

The Minnesota Railroad and Warehouse Commission has ordered a charge of 12 cents for local fares on the Selby-Lake interurban bus line in St. Paul. Minneapolis was not represented and the order does include local fares in that city. Passengers must use tokens to get this half rate. The through interurban rate continues at 25 cents and in Minneapolis the local rate will continue to be the same as the through rate, or 25 cents. The company is equipping itself with tokens and special fare boxes.

A petition of the city of St. Paul for half fares for local travel on the other two interurban bus lines of the Twin City Motor Bus Company, subsidiary of the Twin City Rapid Transit Company, has been denied on the ground that where bus lines parallel railway lines a higher charge should continue. The Selby-Lake line therefore will be rerouted via Smith Park to Minneapolis. The order is to be effective in the near future.

Twin City Rapid Transit Company officials and the bus committee of the St. Paul City Council reached an agreement for this reduction in local bus rates at a conference on May 13. This followed the suggestion by the commission at a hearing earlier in May on a petition by the city for reduced local bus fares on all lines of interurban travel. Commissioner Ivan Bowen said he did not believe buses along car lines should be placed in competition with trolley cars and recommended that the Council and the railway agree on a plan for rerouting bus lines to avoid this competition. This may be considered further in relation to the Como interurban bus line, which could compete with the Como-Harriet interurban railway.

In reporting on a study of electric railway and bus transportation in Philadelphia, Washington, Indianapolis and other cities the statement read in part:

In all of these cities efforts have been made and are now being put forth to co-ordinate local transportation systems under one operating company. This commission is convinced that the proper co-ordination of bus and railway transportation is essential to protect the interests of the street car riding public who are particularly concerned with the low cost of transportation.

Duplication of Service Protested by Oklahoma Railway

The Oklahoma Corporation Commission on June 20 heard an application of the Yellow Cab Transit Company for a permit to extend its Oklahoma City-Sapulpa bus service to Tulsa, with the understanding that it should not carry local passengers between Sapulpa and Tulsa.

The Yellow Cab Transit Company operates small passenger cars from Oklahoma City to Bristow and buses from Bristow to Sapulpa, transferring to the interurban line of the Oklahoma Union Railway at the latter point passengers who desire to go on to Tulsa. The applicant says that there is a demand on the part of the traveling public for through passenger service between Oklahoma City and Tulsa and that many of its passengers object to the necessity of transferring at Sapulpa.

J. A. Frates, vice-president of the Oklahoma Union Railway and president of the Union Transportation Company; R. V. Miller, general manager of those companies, and others opposed granting the permit. Mr. Frates stated that there was absolutely no necessity, in his opinion, for additional service between Sapulpa and Tulsa, and that the proposed through service would not be practical until the roads are paved the entire way between Tulsa and Oklahoma City. He expressed the opinion that the immense investment of his company in rails, cars and bus equipment should be protected against direct competition so long as his company stands ready and is able to furnish any additional service needed. He stated that his company has furnished the Yellow Cab Transit Company terminal facilities in its Sapulpa depot, answered all telephone calls and handled other business of the motor transportation company. Mr. Miller supported Mr. Frates' testimony with figures showing that daily passenger transportation service between Tulsa and Sapulpa now constitutes nineteen interurban trains, two through buses, six other buses and nine Frisco trains, a total of 36 trains or buses each way daily. He expressed the belief that this was sufficient transportation facilities to meet present requirements and that additional competing service would immediately result in loss of business to his company and would probably ultimately result in curtailment of service or discontinuance entirely of interurban service between Tulsa and Sapulpa.

The hearing was continued to a later date to be set by agreement of counsel when testimony will be taken at Tulsa.

Employees Selling Chartered Bus Service in Baltimore

Since it was announced that a commission would be paid to employees of the United Railways & Electric Company, Baltimore, Md., who aid in the leasing of chartered buses and de luxe motor coaches many employees have

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earned these commissions. As far as convenience is concerned, the Baltimore company arranges to take members of a tour party from any gathering place they may select and to the very gateway or door of the point they wish to visit. Not only that, but the coach will pick up each member of a party at his or her door, and at the end of the trip deliver them home in the same manner. This applies, of course, to chartered coaches or buses, and not to the company's scheduled tours, for which individual seats are sold.

In the matter of equipment for this service, the railway has two major types of vehicles — one it designates as "buses," and the other as "coaches." The difference is in the construction and the character of furnishings of the vehicles.

Of their respective types the vehicles of the company are the best procurable. They are ample in size, provided with roomy seats, and in every way built and maintained to afford comfort. These points are stressed by the company to stimulate the employees to still greater efforts in selling this service.

Coast Coach Service Out of Los Angeles

De luxe motor coach service between Pershing square, Los Angeles, and Castellammare, on the coast above Santa Monica, has been started by the Pacific Electric Railway. The new line is known as the Beverly Boulevard Motor Coach line. It operates over the new scenic Beverly Boulevard via Beverly Hills, Holmby Hills, Bel-Air, U.C.L.A. site, Brentwood Park and Pacific Palisades. Service is hourly in both directions, leaving Los Angeles at 6:30 a.m. and 11:30 p.m. on Hill between Fifth and Sixth Streets, and leaving Castellammare at 6 a.m. and 10 p.m.

When Is a "Restricted" Area Restricted?

A new interpretation is sought by bus interests in Massachusetts of the law under which the State Department of Public Utilities issues licenses or certificates of public convenience and necessity for certain bus lines. A test case is being made of the complaint against Alphonso Roberto, who operates a bus through Revere. He is charged with taking on and discharging passengers in a restricted area—an area in which, under his license, he was not permitted to do a local business. The defence, as outlined by Herbert Parker, his counsel, is that a passenger cannot be held a prisoner in a bus, but must be permitted to get out when he desires, even if it is in a restricted area. Mr. Parker takes the position that the Public Utilities Commission cannot even grant express or non-stop permits between two points. "I do not believe," he says, "that you can grant express rights through a territory and prohibit the holder of those rights doing a local business."

Financial *and* Corporate

Railroad After Interurban

Western Pacific Railroad would purchase stock of 100-mile California road

Bondholders of the San Francisco-Sacramento Railway will be asked to take concerted action to obtain the remaining common and outstanding preferred stock of their company unless the shareholders accept the offer of $5 a share on the common and $20 a share for the preferred by Western Pacific Railroad interests. Action by the bondholders is expected to mean foreclosure after Aug. 1 if the offer for the purchase of the stocks to straighten the line's tangled finances is unsuccessful.

Some time ago interests identified with the Western Pacific Railroad agreed to advance funds to pay bond interest and to redeem the payment of bonds of the San Francisco-Sacramento Railroad, Oakland, Cal., operating about 100 miles of electric railway. At the same time they offered $5 a share for the common stock of the railway.

For some time past the condition of the San Francisco-Sacramento Railroad has been critical. Its income has not been sufficient to meet bond interest and redemption payments upon its bonds, not to mention necessary capital expenditures. On Jan. 1, 1927, there came due $23,640 of bond interest, with $42,000 additional needed for bond redemption. The company did not have funds sufficient to meet these demands and a committee pointed out that unless they were met the bondholders would foreclose with a resultant wiping out of both preferred and common stock issues.

To the end that foreclosure might be averted the officers of the company succeeded in interesting the Western Pacific Railroad owners in the future possibilities of the road. These interests then agreed to advance $75,000, a sum sufficient among other things to meet the January bond interest and redemption. These advances, together with past advances, are now secured by a second mortgage on the road. Coupled with this loan the officers of the interurban also succeeded in procuring an offer of $5 a share for 40,000 shares of the outstanding common stock provided, of course, that the holders of at least 40,000 shares of the common stock avail themselves of the offer. The committee that acted in connection with this deal are members of the board of directors of the San Francisco-Sacramento Railroad. It recommended the acceptance of the $5 offer for the shares because considering the financial condition of the road the members of the committee regarded the offer as liberal and because the Western Pacific interests in making any offer at all did so in order to secure operating control of the road so as to effect economies by joint operation and protect their loans.

It was explained that if the Western Pacific interests could not secure the stock through ownership they would undoubtedly have to resort to collection of their loan through foreclosure, a position particularly unpleasant. It was suggested to the stockholders that in order to avail themselves of the offer, they deposit their stock with the Wells Fargo Bank & Union Trust Company, San Francisco.

This proposal lapsed, and was succeeded by the purchase of 40,000 shares of common by Arthur Curtis James. Then an additional offer was made to save the road from foreclosure, and unless this offer succeeds shareholders seem likely to be wiped out.

Traffic Fare and Wage Figures

The decrease in the number of passengers carried by electric railways noted in the month of April compared with April of 1926 was continued in May. The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 202 companies for the latter month, compared with the similar month of 1926, is as follows:

May, 1927	789,050,061
May, 1926	806,061,648
Decrease, per cent	1.00

Average cash fare in cities of 25,000 population and over:

	Cents
June 1, 1927	7.8488
May 1, 1927	7.8304
June 1, 1926	7.6946

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913 = 100 Per Cent
June 1, 1927	57.12	209.61
May 1, 1927	57.10	209.54
June 1, 1926	56.82	208.51

Legal Railway Bonds Certified in Massachusetts

The Department of Public Utilities of Massachusetts has transmitted to the Bank Commissioner its annual list of Massachusetts public utility securities that have met the requirements of law relative to legal investments for savings banks. A long list of gas, electric and water companies have earned at least 4 per cent on their capitalization for the past three years, with gross income in 1926 of at least $100,000, making their bonds legal investments for Massachusetts savings banks. In addition, the bonds of the following electric railways are legal investments through the companies having earned and properly paid, without impairment of assets or capital stock, dividends equal to 5 per cent on all outstanding stock in each of the five preceding years: Boston Ele-

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vated, Boston & Revere Electric Street Railway, Holyoke Street Railway, Union Street Railway, New Bedford, and Eastern Massachusetts Street Railway series "A" bonds—the latter being those issued in exchange for the old Bay State Street Railway bonds under terms of the special act.

Gain in Traffic in Cincinnati

During May 11,447,372 passengers were transported by the Cincinnati Street Railway, Cincinnati, Ohio, an appreciable increase over May of last year, it is set forth in a report submitted to Edgar Dow Gilman, Director of Public Utilities. Walter A. Draper, president of the company, pointed out that the $1,505 surplus, as in previous months, was less than it would otherwise have been by reason of the use of available funds for paying as large a part as possible of the cost of track replacements.

The increase in the number of revenue passengers on cars alone over the corresponding month of last year was approximately 500,000. Mr. Draper said this indicated the tendency on the part of the public to use the improved facility offered by the street car.

Decrease in Baltimore Traffic

The number of revenue passengers carried on the lines of the United Railways & Electric Company, Baltimore, Md., in May decreased 777,440, compared with the similar month in the year previous, totaling 19,001,550 against 19,779,990. In the first five months of 1927, 1,761,984 fewer revenue passengers were transported than in a similar period a year before, the figure being 93,381,855, against 95,143,839 in 1926. For the five months period the net income was $305,758, against $386,569 for the firve months period ended May, 1926.

Line in Batavia to Suspend

Stephen W. Brown, president of the Batavia Traction Company, Batavia, N. Y., said on June 12 that although the company had made every effort to keep up the service it was useless to continue, as the receipts would not warrant any further effort on the part of the officers of the company.

About two months ago the company asked the Common Council to permit operation of buses under sanction from the Public Service Commission, but the officers were not in a position to promise the Councilmen that they would furnish such a service. As yet the Common Council has taken no action on the request.

The line in Batavia is part of the project begun about 25 years ago to build an electric railway from Buffalo through Williamsville to Rochester, of which the line in Batavia was to have been a link, but the proposition never went through. There are only 2½ miles of line in Batavia.

Surplus of Midland Utilities Up $250,068 for Year

Total income of the Midland Utilities Company, Chicago, in 1926 was $4,096,498, compared with $2,985,781 in 1925. Surplus earnings were $1,385,908 after payment of dividends on the prior lien and preferred stocks, interest on loans and funded debt, contingency reserve appropriations, administration expenses and miscellaneous charges. This figure shows a gain of $250,068 over surplus earnings in 1925. Total surplus account of the Midland Utilities Company on Dec. 31, 1926, was $1,951,579.

Operating revenue and other income of the Midland Utilities Company and subsidiaries for 1926 was $20,191,060. Net income for the year, after deductions for rentals, interest on funded debt and other charges and expenses and contingency reserve appropriations, was $4,127,867, which after dividends and earnings accruing to outside subsidiary stockholders to the amount of $845,669 were deducted left $3,282,198 available for Midland Utilities Company dividends.

Gross earnings of the subsidiary companies for the year from electric utility were $7,179,244, from gas utility $7,400,673 and from railway utility $4,928,937.

The consolidated balance sheet of the Midland Utilities Company and subsidiary companies as of Dec. 31, 1926, showed total assets of $113,854,494. Assets of the Midland Utilities Company alone, as of the same date, were $43,558,022, an increase of $11,102,844 over the preceding year.

Passenger traffic in 1926 on the Gary Railways, Gary, Ind., increased 14.4 per cent over the volume handled in the preceding year. The total number of passengers was 17,843,470, compared with 15,597,784 in 1925. During the month of December, always the heaviest month, 1,588,276 passengers were carried, the largest number handled in any month in the history of the company.

Approximately $410,000 was expended by the company during 1926 for the betterment of its present facilities and for extensions required by the transit needs of the district that is served.

The total mileage of the local and interurban railway system of the Indiana Service Corporation, Fort Wayne, Ind., amounted to 282.4 miles at the close of 1926. Car mileage figures for 1926 show an increase of more than 300,000 over the total for the year preceding. Total car-miles for 1926 were 6,766,522. The total number of passengers carried on all lines in 1926 was 25,677,845, compared with 18,403,811 in 1921, or an increase of 39.4 per cent in six years.

INCOME ACCOUNT OF MIDLAND UTILITIE COMPANY

	Year Ended Dec. 31 1926	1925
Total income	$4,096,498	$2,985,781
Total expenses including administration and other charges	508,000	333,779
Interest on loans and serial gold notes	310,368	214,089
Income for year	$3,278,130	$2,437,912
Appropriated as reserves for contingencies	150,000	150,000
Net income for the year	$3,128,130	$2,287,912
Dividends declared	2,391,905	1,747,997
Proportion of subsidiary companies' aggregate undistributed surplus for the year accruing to Midland Utilities Company	155,090	376,877
Combined surplus earnings of the Midland Utilities Company and subsidiaries	1,385,908	1,135,840
SURPLUS ACCOUNT		
Surplus Jan. 1	$1,115,607	$638,228
Net income for the year	3,128,130	2,287,912
Dividends paid	2,391,905	1,747,997
Surplus Dec. 31	$1,951,579	$1,115,670

Receipts and Traffic Increase in Winnipeg

As a result of the continuance of good business conditions in Winnipeg, Canada, in 1926 the railway utility of the Winnipeg Electric Company registered further improvement. This fact was disclosed in the annual report of the president and directors.

The railway carried 57,985,000 revenue passengers, compared with 55,096,000 in 1925. Its gross receipts increased $179,000. Operating or working expenses of the railway end of the business showed an increase of $97,000

INCOME ACCOUNT OF THE SUBSIDIARY COMPANIES OF THE MIDLAND UTILITIES COMPANY FOR YEAR ENDED DEC. 31, 1926

	Indiana Service Corporation	Chicago, South Shore & South Bend Railroad	Gary Railways
Operating revenue	$4,345,946	$1,056,858	$1,349,331
Operating expenses	2,626,216	1,001,232	1,009,785
Net operating revenues	$1,719,729	$55,626	$339,546
Taxes	236,239	32,466	49,848
Net operating income before providing for retirement expense	$1,483,489	$23,160	$289,697
Retirement expense	273,406	16,611	64,335
Net operating income	$1,210,083	$6,548	$225,362
Other income	9,366	35,952	.....
Total income	$1,219,450	$42,501	$225,362
Deductions from income	58,816	85,583	16,289
	$1,160,633	$43,082*	$209,072
Deduct: Interest on funded debt	739,670	33,196	72,182
Net income available for dividends	$420,963	$76,278*	$136,889
Dividends on preferred stocks	119,076	.....	57,268
Net income available for dividends on common stocks	$301,886	$76,278*	$79,621

*Deficit.

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over the preceding year. This increase was due to several factors, among which are the operation of a greater number of street cars and buses to take care of the increased traffic and extensions to service required by the city of Winnipeg and municipalities served, a wage increase for trainmen, which was made effective May 1, and increased expense for fuel to heat street cars and removal of snow from tracks on account of the severe climatic conditions experienced in November and December.

The company did considerable extension work during the year, including the construction of a new double track on Osborne Street and Memorial Boulevard, construction of a single track extension on St. Anne's Road to the extent of 8,200 lineal feet, laying a second track of 1,100 lineal feet in East Kildonan, alterations and equipping with treadles 60 of the street cars to make them adaptable for one-man, two-man operation. Four new buses were purchased.

The retiring of the outstanding balance of 5 per cent first mortgage bonds of the Winnipeg Street Railway which matured Jan. 1, 1927, amounting to $468,000, was largely taken care of by selling an equal amount at par value of first refunding 30-year 5 per cent sinking fund gold bonds, due Jan. 1, 1935.

In line with its policy of enlisting as many local shareholders as possible, the company conducted its second customer-ownership campaign on Dec. 13, 1926. Only 2,500 shares of the company's 7 per cent cumulative preference stock were offered and the campaign was advertised to run for ten days, but so great was the demand that the sale closed within 48 hours, with 11,377 shares applied for by 2,222 customers and cash receipts of more than $635,000.

At a meeting of the shareholders held on Jan. 20, 1927, an increase in the 7 per cent preference shares from $3,000,000 to $10,000,000 was authorized. The stock is not to be offered for sale at one time, but is to be held in the treasury and sold from time to time as the company requires funds for extensions and improvements. The call price of the existing $3,000,000 of preference stock, as well as the additional $7,000,000 authorized, was increased to 105 and accrued dividend.

One-Car Road Would Suspend

George Tunnell, manager of the Milledgeville Railway, Milledgeville, Ga., recently filed with the Georgia Public Service Commission a petition asking for authority to discontinue the passenger car between the Georgia depot and the State Sanitarium. The car has been in operation since the charter was granted permitting the railroad to run its tracks through the city. At the hearing before the commission Representative McCluney argued that the franchise provided for both passenger and freight service, and the company should be required to stop both if it stopped either. Judge E. R. Hines, G. E. Barnes, C. E. Yeomans, an engineer, and Mr. Tunnell appeared in behalf of the petition to stop passenger service, undertaking to show that it was unprofitable, because of bus and other competition.

Line to Mount Clemens Dropped by Detroit United

Direct service between Detroit and Mount Clemens on the Lake Shore line of the Detroit United Railway, Detroit, Mich., ceased at midnight on June 22 with the expiration of its 30-year franchise. According to W. S. Rodger, general traffic agent of the line, the service will be discontinued only in Grosse Pointe Shores and Harrison Township. The line will continue to operate from Alter Road at the city limits to Gaukler Point, near Defer Road. The discontinuance of the schedule through Harrison and Grosse Pointe is being made at the requests of the residents in those sections.

According to the Mount Clemens dispatches a request by the railway for a day-to-day permit to operate would be refused by Harrison Township, where objections to the line and service have been prevalent for some time. Negotiations are under way now in Mount Clemens and St. Clair Shores to start a bus service in both places and connect the two. The change by the railway will not affect passengers going directly from Detroit to Mount Clemens, as the company has a direct line on Gratiot Avenue. In fact, the shore line has not offered this service in the last two years, as the cars have only come to the city limits.

Railway Service in Maine Curtailed

Further curtailment in service by the York Utilities Company between Sanford and Biddeford, Me., via West Kennebunk, Kennebunk and Kennebunkport, became effective on July 1. The new schedule cuts down the number of trips to Sanford to four, while cars to Biddeford, from West Kennebunk, will run on a two-hour schedule. About fifteen men, including motormen, conductors and mechanics employed in the carhouse, will be affected by the curtailment. This reduction in service has come about through lack of patronage.

While during the year 1925 and 1926 the revenue from railway service between Sanford and Biddeford remained about the same, during the first six months of this year there has been a decrease of about 20 per cent, and this in spite of the fact that the company has run cars frequently and at convenient periods. A few years ago the company was forced to abandon its line to Wells, and on April 30 of this year the line to Cape Porpoise, at one time a well-patronized section of the road, was discontinued. Last year the company made the Kennebunkport branch a freight line, providing buses for passenger service to that town and Cape Porpoise.

Earnings Record of Third Avenue Railway Continues Good

The report of the Third Avenue Railway, New York, for the eleven months ended May, 1927, shows record high operating income of $14,017,662, an increase of $627,421 over the corresponding period of last year. After all deductions, including liberal allowances for maintenance of way and equipment and allowance for full interest on the adjustment 5 per cent bonds, there was a surplus of $263,186, an increase of $233,827 over last year. With the company in a strong current position and income steadily increasing, the *Wall Street Journal* anticipates payment of the regular 2½ per cent interest on the adjustment 5 per cent bonds, due on Oct. 1.

Santa Monica Line to Go

The Pacific Electric Railway, Los Angeles, Cal., has been authorized by the Railroad Commission to discontinue service and remove its track on Broadway and Third Street in the city of Santa Monica on the following routes: A single-track railway commencing at the switch points of the turnout in the northerly track on Ocean Avenue, easterly of Broadway, thence northerly across Ocean Avenue to Broadway, thence northeasterly along Broadway to Third Street, thence northwesterly along Third Street to the switch points of the turnout in said Third Street west of Santa Monica Boulevard, also the curve at the south corner of Santa Monica Boulevard and Third Street, connecting the tracks on Santa Monica Boulevard with track on Third Street.

MISSOURI COMPANIES MERGE.—The Springfield Gas & Electric and the Springfield Traction Company, Springfield, Mo., both under the same ownership, have been merged as the Springfield Electric Company.

NET INCOME LOWER.—For the eleven months period ended May 31, 1927, passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $10,503,453, against $10,430,556 for a similar period of the year previous. Operating expenses and taxes were $9,166,999, against $8,892,381 for the 1926 period. After the consideration of income deductions a net corporate income remained of $1,041,750, against $1,321,424 for the period ended May 31, 1926.

ABANDONMENT PETITION HEARD.—Decision on the proposed abandonment of part of the service of the Geneva, Seneca Falls & Auburn Railroad, Seneca Falls, N. Y., is under consideration by the Public Service Commission following a hearing conducted at Seneca Falls on June 20 by the Public Service Commission. The railway is in the hands of a receiver and foreclosure proceedings are pending. The Seneca Falls branch from Fall and Cayuga Streets east is operated at a loss and the company seeks to cut it off.

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Book Reviews

Public Utility Finance

By Walter E. Lagerquist. Chicago and New York: A. W. Shaw Company. 671 pages. Price, $7.50.

Another important accession has been made in this volume to the growing list of titles on utility subjects. In fact, Mr. Lagerquist's book is the first of several volumes to be sponsored by the *Institute* for Research in Land Economics and Public Utilities to be entitled "Materials for the Study of Public Utilities," which contemplates a closely co-ordinated series in which each volume will be devoted to a particular subject, yet represent only a part of a unified whole. These volumes will include works on public utility economics, regulation, labor, accounting, operation and management, and rate making.

"Public Utility Finance" really grew out of the need the author met in searching for material in connection with a special purpose in the field of public utility finance. This search covered the technical periodicals on utilities, the proceedings of all the technical societies, and financial periodicals of the past fifteen years which might have any bearing on the field, together with innumerable pamphlets, all of the important financial books, and a considerable number of technical publications. Of such superior character was the material thus unearthed that it seemed desirable to offer the results for publication.

Many short paragraphs on finance dealing with rates, regulation, etc., could not be used, as no practical sequence could be developed out of the material. Only such complete articles or excerpts were selected on respective topics as would fit into the scheme of the author's outline. The author frankly says that differences of opinion will arise among those familiar with the fields of literature mentioned as to the selections made, but this is a responsibility the collector of materials assumes. In certain controversial matters an effort has been made to include each side of the controversy.

It is, indeed, difficult properly to appraise a book like "Public Utility Finance," but whatever the defects inherent in a compilation of this kind from the point of view of coherence, there can be no question about the wealth of material contained between its covers or its value and availability to every one seriously concerned with public utility management. The very diversity of the subjects is at one and the same time both distressing and pleasing. This is made true by the dissimilarity of the styles of the authors of the articles. The book cannot be taken at a gulp. Such books are never so intended, but the volume is not without its leaven of sweetness, best instanced, perhaps, by the recollection of F. B. H. Paine's quotation of a sentence from a rate case as presented by *Life* to this effect:

To determine a fair price for any commodity or service take one dozen investigators at a large salary, 57 lawyers, eighteen statisticians, and any desired number of detectives, experts, stenographers, and so forth. Mix in a large hall. Add the testimony of a couple of dozen buyers as to the amount they want to pay for the commodity or service. Sprinkle in 400 absurd and insulting questions to sellers of the same. Stir briskly; boil six weeks, allow to simmer 14 months, and divide the product by 2. The result may not have any sense in it, but it will have as much as by any other way of getting at the matter, and it will please more voters than it will immediately ruin.

Or, as the *Wall Street Journal* more recently said about a contemporary who took itself very seriously, that it did not know any better than Joe Eastman or Will Rogers what the invested capital of the railroads is.

Of course valuation is only a part of the problem, but, as Mr. Paine says, it is for all of us, now, to eliminate the travesty which amounts always to a tragedy; to do so the closest analysis is essential of what constitutes a "valuation." "Public Utility Finance" is a source book, and a very valuable one.

Experimental Electrical Engineering

Third edition, revised. By Vladimir Karapetoff. New York: John Wiley & Sons, Inc. 620 pages. Price, $5.

More than 100 teachers of electrical engineering and many of the leading engineers in industry have helped in the preparation of Vol. II, new revised third edition of Professor Karapetoff's book. The book represents the culmination of more than 25 years of studies in electrical literature in various languages; theoretical research, experimental work, practical work in industrial concerns, designing and teaching. Besides a table of contents, the text has a list of experiments, with an extensive index to all subjects mentioned and to the keywords as well.

Universal Directory of Railway Officials

Westminster, London, S.W. 1: The Directory Publishing Company, Ltd. Price, $5.

The 33d annual edition, 1927, of the Universal Directory of Railway Officials has been compiled. There are sections on Great Britain, Ireland, Europe, Asia, Africa, Australasia, North America, Central America, Mexico, West Indies, South America. It also includes the personal index of railway officials. Many engineering firms doing business with railways at home and abroad use this book.

Captains in Conflict

By Robert R. Updegraff. Chicago & New York: A. W. Shaw Company. 286 pages. Price $2.

If American big business were ever afflicted with a fit of self-complacency or smugness a few doses of "Captains in Conflict" would prove an efficacious cure. For a reading of this book would awaken the business generation of today to a realization of its noble heritage which has been the main subsidy in the present day spectacular ventures.

For 25 years business pioneers sailed uncharted waters. Many a gale had to be weathered, many a rough wave buffeted and countless ventures foundered before serenity replaced anxiety. But that business generation which set sail in 1900 had the attributes of the pioneer—courageous, long suffering and resourceful. Disguised as a novel, this recital of a business struggle is both entertaining and enlightening. John Rowntree struggles to play the business game fairly. His competitor, H. B. Lockhart, a former employee of Rowntree's father and an absconder of the latter's stove patent, is a hardened, unscrupulous money-hound who overcapitalizes his corporation and cares not a tinker's dam for widows and orphans. The indomitable courage of young Rowntree, a noble scion of a still nobler father, continues over a period of 25 years. Through many anxieties, unfortunate breaks and heart-breaking defeats he comes up smiling on a platform of honesty, service and progress. When the hour struck for him to make a spectacular condemnation of his opponent, the epitome of sordidness and chicanery, he passes up the chance and unostentatiously puts the screws on the business wrecker.

But "Captains in Conflict" does much more than tell the story of the Rowntree stoves versus the Consolidated ranges. Herein is enfolded an epoch in the business drama, human and stirring. The era of great business combinations and industrial consolidations had dawned; the quintessence of selling was in the product and not in the personality of the salesman. Business promoters typified by Rowntree talked of simplification, of a human attitude in building up business and of the trend toward capital "fast coming to represent savings of the working millions."

Business leaders today will find inspiration in Mr. Updegraff's portrayal of business in the making. They will profit by this tale of rivalries and legerdemain to the end that they too may become Rowntrees in an effort to keep business on the ascendent scale it reached at the turn of the century. It should teach the leaders of today that severance with the past is neither possible nor desirable, for who would gainsay that the future stability of business is not dependent upon the wise moves of today as the courageous undertakings of a quarter of a century ago made clearer sailing for the present day promoters. "Without the learning of the past, there can be no future" should be an important part of big business philosophy.

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Personal Items

H. S. Robertson Denver President

Former vice-president and general manager of Colorado property selected to succeed the late Mr. Stenger

Howard S. Robertson, vice-president and general manager of the Denver Tramway, Denver, Col., was named president of the company by the board of directors on June 30. Mr. Robertson succeeds Ernest Stenger, who died May 28. He will continue to act as general

H. S. Robertson

manager in his capacity as president. Mr. Robertson made this brief public statement:

There will be no change in policies. I shall try, as Mr. Stenger did, to give the people of Denver a first-class street car service.

Mr. Robertson knows Denver, and he certainly knows the Denver Tramway. He has been connected with the property for 26 years. Just about two years ago he was made general manager, following the resignation of Edward A. West as general superintendent to join the Utah Light & Traction Company, Salt Lake City. Of course, his initiation into that office was a little more formal than the newspaper account of it at the time made his promotion appear, but in sum and substance it ran like this: "Mr. Robertson, you are thoroughly familiar with the policies of the company, and as our general manager you will please direct us." That's how the vacancy was filled. His advancement to the presidency was largely a repetition of this procedure, with its implied vote of confidence in the man.

For about twelve years previous to his appointment as general manager, Mr. Robertson had been secretary of the company and a member of the board of directors. While he did not take an active part in the operating details, he knew what was going on. Because of this and his untiring devotion to duty, his advancement to the general managership followed. Exercise of the same attributes has won for him the place of president.

Up to the time of his appointment as general manager, Mr. Robertson had worked so silently for so many years at Denver as to escape the attention of practically all but his friends and immediate associates. He was born in Cheyenne, Wyo., on May 23, 1878. When he was only three years of age the family moved to Denver, and he has been there ever since. After finishing in the public schools he was graduated from West Denver High School, and in due time walked from the University of Colorado's Law School carrying his sheepskin. This was in 1901. He lost no time in having a gold-lettered sign printed, but went to work in the claim department of the Denver Tramway. Two years later he joined the legal department as an assistant to C. J. Hughes, Jr., the general counsel. In 1908 he was appointed general attorney, serving with Gerald Hughes, who had succeeded his father as general counsel.

Those who know the man well realize that he will do just as he says, namely, try to give the people of Denver a first-class service. Mr. Stenger was never able to do for Denver all that he had hoped to do, but nobody will ever accuse him of not having tried. Neither is it ever likely to be said of Mr. Robertson that he did not try. Not all of us realize our ideals. It is not fair to hold a man to accountability for that, but it is reasonable to hold a man to accountability in so far as he does not apply his talents to the fullest extent in the effort to attain the ideal. Judging the man from past experience, Denver will never have cause to complain about Mr. Robertson on this score.

C. A. Babtiste Retires from "Journal"

Carl A. Babtiste has resigned as New York district manager of the ELECTRIC RAILWAY JOURNAL and *Bus Transportation* at the suggestion of his physician and the solicitation of his family so as to rest for a period and then devote himself to his avocations. Mr. Babtiste has been actively associated with the McGraw-Hill Publishing Company, Inc., without interruption for 28 years. Up to the very day of his resignation he had always been a consistent business builder and, what is even more important, an institution builder. With him the company always came first. Perhaps that is why he was always so happy and so successful in his work. One thing is sure. For perseverance, loyalty and capacity to produce, he has always upheld the very highest ideals of the McGraw-Hill organization.

Associates of his on the ELECTRIC RAILWAY JOURNAL, officials of the McGraw-Hill company and a few intimates gave expression to these sentiments at a farewell luncheon at the Engineers Club, New York, on July 7. About four years ago, at the completion of 25 years of service with the company, James H. McGraw tendered a dinner to him, at which his services were substantially recognized.

Effective July 15 T. F. Mueller, long associated with the business staff of the ELECTRIC RAILWAY JOURNAL, will take over the sales territory, or its equivalent, made vacant by the resignation of Mr. Babtiste.

Friends Honor R. T. Senter

In a testimonial dinner at the Ritz-Carlton Hotel in Philadelphia on July 7 friends of R. T. Senter, president of the Philadelphia Rapid Transit Company, gathered to congratulate him upon his

R. T. Senter

elevation to the presidency of the P.R.T. and to wish him well in his new post of broadened responsibilities. Prominent railway executives, leading citizens of Philadelphia and officials of his own organization joined in extending their good wishes.

E. A. Ballard, chairman of the dinner committee, acted as toastmaster. Among other things he said:

The greatest asset in the world is friendliness—the power to make and to hold friends. Among his many technical and executive qualities, Ralph Senter makes friends wherever he goes and draws them close with bonds that strengthen with time.

By his own chief, T. E. Mitten, president of Mitten Management, Mr. Senter was characterized as the "pinch hitter" of P.R.T. Mr. Mitten said:

We depend on him to deliver when others fail. Though one of the country's greatest engineers, Mr. Senter is practically self-educated. He has grown up with us. While possessing technical knowledge and judgment surpassed by few men, he has at the same time the human qualities of executive ability and friendship which make him the logical man to head P.R.T. at this period, when the primary object of our company is to establish closer bonds of friendship with our patrons and our public.

Other speakers included L. S. Storrs, W. G. Gove, C. C. Pierce, Judge W. J. Conlen, R. P. Hooper and Mr. Senter.

Mr. Storrs said that "Mr. Senter's background of technical and disciplinary training furnished an ideal foundation for his present position of executive responsibility." Mr. Gove expressed satisfaction at the appointment of a

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technical and mechanical man to the post of chief executive. He testified also to the ability and sterling qualities of the new president. Mr. Pierce, Mr. Conlen and Mr. Hooper joined in attributing Mr. Senter's elevation to sheer merit. "He has paid the price of his success in hard work," was the keynote of their remarks.

Mr. Senter has been associated with Mitten Management for 28 years. He was born in 1876 in Columbus, Ohio. He was educated in the public schools of that city, Michigan Military Academy and the University of Michigan. His engineering education was obtained at Armour Institute of Technology and his practical experience with the Twin City Rapid Transit Company, International Railway, Chicago City Railway and Philadelphia Rapid Transit Company.

Paul D. Cravath Acting Chairman of Westinghouse

Following the annual stockholders' meeting, the board of directors of the Westinghouse Electric & Manufacturing Company met on July 6 for organization. The board re-elected the existing officers, except that, in view of the death of its late chairman, General Guy E. Tripp, it elected as acting chairman Paul D. Cravath, a director and for upward of thirty years general counsel of the company, to serve until the election of a permanent chairman. It was stated on behalf of the executive committee that it had no one at present in view for that office. The following resolutions were adopted in memory of General Tripp:

It is with profound sorrow that we record the death on June 14, 1927, of our friend and chairman, Guy Eastmann Tripp. General Tripp was elected chairman of the board of directors of the Westinghouse Electric & Manufacturing Company on Jan. 10, 1912, and served continuously in that capacity until his death. The qualities of leadership, courage, judgment and human sympathy which he possessed to such an extraordinary degree created for him a place in the esteem and affection of his associates and friends which it is given few men to enjoy. The company has lost a great leader, and we, together with all who have been privileged to know him and work with him, have lost the inspiration of a helpful, firm and loyal friend.

As a tribute of respect to his memory, which will always remain a most cherished possession, and in token of sorrow for his decease, the board of directors order this minute entered on the records and a copy thereof, suitably engrossed, sent to the family of General Tripp with an expression of deep sympathy in their loss.

J. W. Howard, general superintendent of the Galveston-Houston Electric Company, which operates the interurban line between Galveston and Houston, Tex., has gone to Lowell, Mass., to become sales manager of the Lowell Gas Light Company. This is the third promotion for Mr. Howard within the last six years. He is now only 28 years old. In 1921 Mr. Howard was graduated from Stevens Institute at Hoboken, N. J., with a degree in mechanical engineering. He started as a student engineer with Stone & Webster and his rise has been rapid. His first important post was as industrial engineer of the Pawtucket, R. I., Gas Company. From Pawtucket he went to Houston as general superintendent of the Galveston-Houston Interurban.

E. A. Cordell has assumed his new duties as traveling passenger and freight solicitor for the Illinois Traction System in St. Louis, Mo. He formerly was in a similar position at Bloomington, Ill. The latter post has been filled by Harold U. Jolly, who was with the I.T.S. at Peoria for eighteen months prior to moving to Bloomington.

OBITUARY

Percy Warner

At dawn on Sept. 20, 1863, an old blind mule was hitched to a covered wagon near Chattanooga, Tenn., so the story goes, and the Warner family, hearing the strains of "Yankee Doodle," started out on a perilous journey. One occupant of that vehicle was Percy, then two years old. The hardships of that immemorial peregrination revealed the courage and forbearance of the travelers, yet the arrival in Nashville was quiet and unceremonious. For one of the principals in that early migration the final lap of the journey was completed on June 21, when Percy Warner was conducted to his final resting place at Mount Olivet Cemetery. The same simplicity attended the final journey and the same flair for courage was somehow discernible in his descendants. Nashville mourned quietly for the man who played so active a part in the commercial and civic life of the community, who had left his impress on the very contours of the country and the compass of whose heart had stretched into many and varied Southern circles. Electric railway cars were halted, flags were at half mast and ball players stood in reverential silence to give a last tribute.

One of Percy Warner's notable successes was the Nashville street railway property. He became receiver of the company in 1902, effecting a reorganization in 1903. Later the present Nashville Railway & Light Company was to emerge with Mr. Warner as president. He retained this post until 1914. From a utility company of 60 cars and 62 miles of track he converted it into a public service system of 125 cars and 105 miles of track. He seemed to anticipate the present-day slogan for better and more comfortable cars and improved track. Other railway properties, namely those in Birmingham and Chattanooga, also claimed his attention.

Since 1914 Mr. Warner had been connected with utility development over the entire South. He was interested in hydroelectric power. But that again was only one of the many interests of the man. Early in his career he devoted his energies to the mining and furnace business with his father and elder brother. He became general manager of the Aetna Iron Company and the La Grange Furnace Company.

In 1925 he was elected a member of the city board of park commissioners. He had already built up Glendale Park, a project owned by the Nashville Railway & Light Company. His idea was to surround the city of Nashville with a chain of parks linked by a scenic roadway.

News of his death brought tributes from all over the South, from the lowly negro to the aristocratic Tennesseean. As one of the old-timers on the cars put it, "He's been the inspiration for dozens of improvements that people will never know of, and if he lived, there's lots of things he would have done yet. . ." It was only after his sudden death that a few friends who were with him at the recent convention of the National Electric Light Association at Atlantic City recalled that he had complained of a slight affection of the heart. But with his usual habit of self-effacement he declined to talk of it. He had gone to New York after the Atlantic City convention to confer with an anonymous donor of $50,000 in paintings and art pieces for the Parthenon in Centennial Park. He had returned on June 16 and he died on June 18, before he could inform the other members of the park commission at Nashville of the results of the journey.

William Charles Kidd

William Charles Kidd, sales representative of the Ramapo Ajax Corporation, Hillburn, N. Y., and secretary-treasurer of the Track Supply Association, died at his home in Suffern, N. Y., on July 5 following several months' illness. Mr. Kidd had been known intimately for many years by many railway and supply company representatives. He was born on April 23, 1858, in Burnley, England. In 1881 he went with the Ramapo Iron Works, now the Ramapo Ajax Corporation, at Hillburn as a machinist, in which capacity he was instrumental in the development of the Ramapo automatic switch stands. Later he was taken into the sales organization of the company, where he had been for more than 25 years. Mr. Kidd was particularly active in the Track Supply Association, an organization of supply concerns which exhibits at the Roadmasters' annual convention. In 1921 he was instrumental in organizing the Metropolitan Track Supervisors' Club of New York, and until early this year was secretary-treasurer of the club. At the time he relinquished this office he was made honorary secretary and treasurer of the club for life.

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Manufactures and the Markets

110,032 Sq. Ft. Sold by A.E.R.A.

Exhibit to open Saturday noon, Oct. 1, and it is predicted that it will break all records

SINCE the exhibit committee of the 46th annual convention of the American Electric Railway Association met in Cleveland on June 22 and assigned 108,272 net square feet to 226 exhibitors, reports from Fred C. J. Dell, director of exhibits, have raised these figures to 110,032 net square feet to 235 exhibitors, which are exclusive of any track space for the display of street cars. The space demand has exceeded all expectations.

Three months still remain before the opening of the convention. Experience has shown that space applications pour in at association headquarters all summer—in fact, until just a day or two preceding the opening. There are always the last minute applicants to be cared for, if possible. When the 1926 convention opened there was a waiting list of more than twenty concerns that had applied and which it had been impossible to care for. Present indications point to a similar condition this year, except that the list will be larger.

When discussing the situation Direc-

List of Exhibitors Assigned Space for A.E.R.A. Convention by Exhibit Committee, June 22

Name	Booth Number
Adams & Westlake Co.	407
Ahlberg Bearing Co.	674
Aluminum Company of America	143 - 145
American Brake Materials Corp.	½ of 226
American Brake Shoe & Frdy. Co.	½ of 226
American Brass Co.	122, part of 123
American Car & Foundry Co.	½ of 120
American Car & Foundry Motors Co.	620 - 625
American Hammered Piston Ring Co.	411
American Steel & Wire Co.	631, 633
Anaconda Copper Mining Co.	½ of 123
Appleton Electric Co.	637
Art Rattan Works, Inc.	602
Association of Manufacturers of Chilled Car Wheels	268
Baker-Raulang Company	452-455
Baldwin Locomotive Works	266
Bender Body Co.	669-673
Bendix Brake Co.	481
Bethlehem Steel Co.	246-252
Blackhawk Manufacturing Co.	436
Black & Decker Manufacturing Co.	429, 431, 433, 435
Bonney Forge & Tool Works	410
Bosch Magneto Co., Robert	483
Bragg-Kliesrath Corporation	403
Bridgeport Brass Co.	269
Brill Co., J. G.	½ of 120
Brown Body Corp.	667,668
Brown-Lipe Gear Co.	439
Buda Co.	202, 203
Budd Wheel Co.	482
Bus Age	520
Bus Transportation	102
Carborundum Co.	463
C. G. Spring & Bumper Co.	516, 517
Carey Co., Philip	239, 241
Carnegie Steel Co.	½ of 626
Chase & Co., L. C.	603
Cheatham Electric Switching Device Co.	236
Chilton Class Journal Co.	504
Chillingworth Manufacturing Co.	616
Christensen Air Brake Co.	402
Cinch Manufacturing Corp.	656
Clark Equipment Co.	612
Clark-Williams Engineering Co.	210, 211
Cleveland Fare Box Co.	270
Cleveland Frog & Crossing Co.	245
Cleveland Pneumatic Tool Co.	477-480
Cleveland Tanning Co.	501
Collier, Inc., Barron G.	104
Consolidated Car Heating Co.	118, 119
Continential Motors Corp.	502, ½ of 503
Dayton Mechanical Tie Co.	238, 240
Dayton Steel Foundry Co.	521
De Laval Separator Co.	408, 409
DeVilbiss Company	460
Dixon Crucible Co., Joseph	683
Dot Lubrication Division (Carr Fastener Co)	413
Drew Elec. & Manufacturing Co.	253
Duff Manufacturing Co.	681
Eagle-Ottawa Leather Co.	½ of 500
Earll, C. I.	615
Eaton Axle & Spring Co.	½ of 500
Eberhard Manufacturing Co.	440
Eclipse Railway Supply Co.	242
Economy Electric Devices Co.	½ of 117
Edwards Co., Inc., O. M.	506
Egyptian Lacquer Mfg. Co.	524
Eisemann Magneto Corp.	505
Electric Railway Equipment Co.	692
Electric Railway Improvement Co.	319, 321, 323
Electric Materials Co.	636, 638
ELECTRIC RAILWAY JOURNAL.	101
Electric Storage Battery Co.	518, 519
Electric Service Supplies Co.	139
Erie Malleable Iron Co.	201
Feralite Corp.	635
Ferodo & Asbestos Inc.	522, 523
FitzJohn Manufacturing Co.	406, ½ of 405
Flower Co., D. B.	243
C. B. Forbes Publishing Co.	121
Fuller & Sons Manufacturing Co.	484
Garford Truck Co.	665, 666
General Carbonic Co.	318
General Electric Co.	113
Glidden Co.	450
Globe Ticket Co.	212, 213
Godwin Co., Inc., W. S.	214
Gold Car Heating & Lighting Co.	222, 224
Graham Brothers	425-428
Gramm Motors, Inc.	663
Griffin Wheel Co.	106
Guide Motor Lamp Mfg. Co.	679
Hale Kilburn Co.	204-206
Haskelite Manufacturing Corp.	401
Hercules Motors Corp.	498
Heywood-Wakefield Co.	263-265
Houde Engineering Corp.	499
Hunt-Spiller Manufacturing Corp.	508
Hyatt Roller Bearing Co.	651, 653
Illinois Motive Equipment Co.	654
Illinois Steel Co.	½ of 626
Indianapolis Switch & Frog Co.	317
Ingersoll-Rand Co.	301, 303, 305, 307
International Harvestor Co.	422-424
International Motor Co.	448
International Register Co.	128
International Steel Tie Co.	300, 302, 304, 306, 308, 310, 312, 314, 316
Invincible Vacuum Cleaner Co.	680
Irving Iron Works	693
Jeandron, W. J.	225
Johnson Fare Box Co.	655
Johnston Paint Co., R. F.	124, 125
Johnston & Jennings Co.	507
Karpen & Brothers, S.	451
Kelton-Aurand Manufacturing Co.	½ of 503
Kenfield-Davis Publishing Co.	103
Lang Body Co.	449
Leece-Neville Co.	613, 614
Lorain Steel Co.	627-630
Lupton's Sons Co., David	207
Mack-International Motor Truck	443, 445, 447
Mack Motor Truck Co.	442, 444, 446
Mack Trucks, Inc.	441
Malleable Iron Research Institute	646, 648
Malleable Screw Products Co.	649
Martindale Electric Co.	254
Massachusetts Mohair Plush Co.	684
Massillon Steel Castings Co.	219
Metal & Thermit Corp.	244, 309, 311
Miller-Schorn Rapid Transit System	618
Money-Meters, Inc.	688
More-Jones Brass & Metal Co.	220, 221
Morrison Jack Co.	438
Motor Products Corp.	461
McCloskey Torch Co.	320
Macdonald Manufacturing Co.	690, 691
Nachod & U. S. Signal Co.	235
National Brake Co.	685
National Carbon Co.	237
National Cash Register Co.	645, 647
National Lead Company	223
National Malleable & Steel Castings	650, 652
National Pneumatic Co., Inc.	107, 109, 111
National Railway Appliance Co.	½ of 116
National Tube Co.	632, 634
New Departure Manufacturing Co.	640, 642
Nichols-Lintern Co.	677
Norma-Hoffmann Bearings Co.	664
North East Electric Co.	609, 610
Northern Granite & Stone Co.	134
Nuttall Co., R. D.	110
Ohio Brass Co.	115
Ohmer Fare Register Co.	227-233
Okonite-Callender Cable Co.	½ of 208
Okonite Co.	½ of 208
Pennsylvania-Ohio Electric Co.	145
Perey Manufacturing Co., Inc.	686
Petry Co., Inc., N. A.	675
Pittsburgh Plate Glass Co.	218
Protex Glass Co.	529
Pyrene Manufacturing Co.	639
Radel Leather Mfg. Co.	676
Rail Joint Co.	½ of 262
Railway Age	487, 489
Railway Materials Corp.	256, 258
Railway Purchases and Stores	689
Railway Track Work Co.	216, 313, 315
Railway Utility Co.	217
Reo Motor Car Co.	404, ½ of 405
Robertson Co., H. H.	261
Rollway Bearing Co.	641
Ross Gear & Tool Co.	611
S. K. F. Industries, Inc.	½ of 262
Safety Car Devices Co.	½ of 108
Safety Equipment Service Co.	643
Sattley Co.	127
Saums Co., George W.	215
Selden Truck Corp.	476
Six Wheel Co., The	600, 601
Smith Heater Co., Peter	126
Snap-On Wrench Co.	458
Splitdorf Electrical Co.	432
St. Louis Car Co.	105
Standard Johnson Co., Inc.	½ of 116
Standard Steel Works Co.	267
Standard Underground Cable Co.	678
Stevens-Walden-Worcester, Inc.	434
Studebaker Corp. of America., The	473, 475, 474
Swartwout Co., The	260
Templeton, Kenly & Co., Ltd.	617
Texas Co, The	129, 130
Tickometer Co., The	682
Timken Detroit Axle Co., The	400
Timken Roller Bearing Co., The	607, 608
Toledo Pressed Steel Co., The	325
Tool Steel Gear & Pinion Co.	½ of 117
Tuco Products Corp.	644
Twin Coach Co.	468-472
Una Welding & Bonding Co.	131
Union Metal Mfg. Co.	619
Universal Crane Co.	694
Universal Lubricating Co.	257, 259
Van Dorn Coupler Co.	234
Van Norman Machine Tool Co.	527
Vichek Tool Co.	430
Wadell Engineering Co.	456
Walker Manufacturing Co.	457
Wallace & Co., J. D.	509
Walter Motor Truck Co.	604, 605
Waukesha Motor Co.	606
Westinghouse Companies	144
Westinghouse Electric & Manufacturing Co.	112
Westinghouse Traction Brake Co.	½ of 108
Wharton, Jr., & Co., Inc., Wm.	209
Wheel Truing Brake Shoe Co.	255
White Co., The	657-662
Wilkening Manufacturing Co.	459
Willard Storage Battery Co.	412
Will Motors Corp., C. H.	495-497
Wood Conversion Co.	511
Yellow Truck & Coach Manufacturing Co.	414-421
Zenith-Detroit Corp.	437

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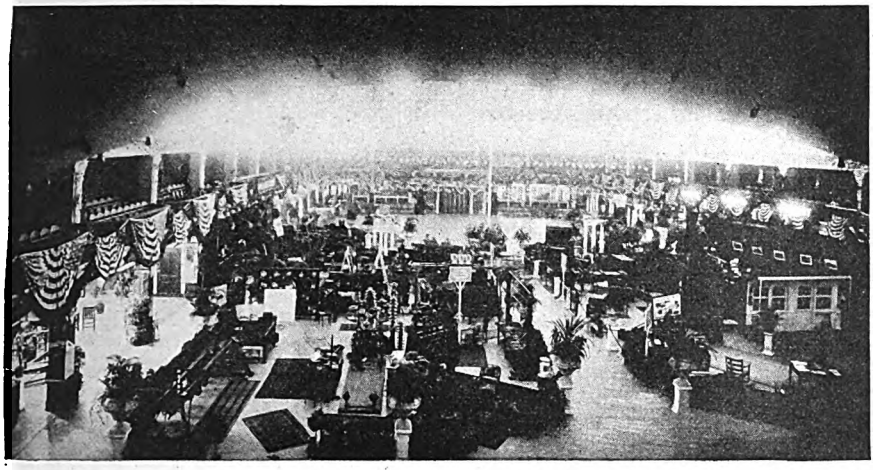
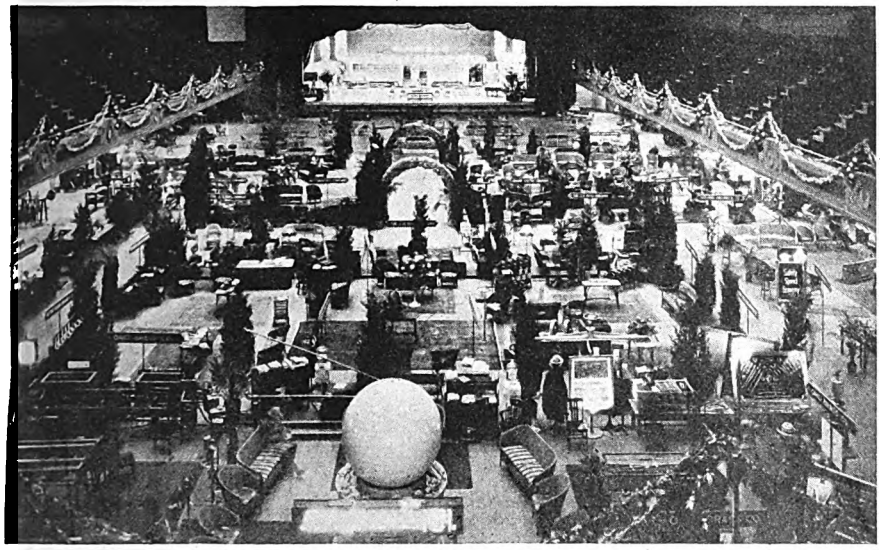
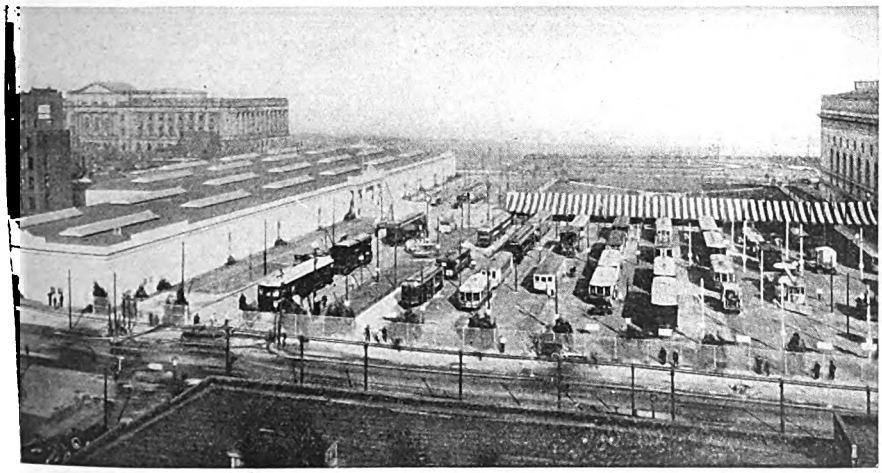
COMPARISON OF ATTENDANCE AT EXHIBIT CONVENTION OF A.E.R.A.

Year	Location	Convention Registration	Manufacturer Company Members	Number of Exhibitors	Total Space Sold, Sq.Ft.
1916	Atlantic City	3,271	208	125	57,329
1919	Atlantic City	3,166	206	157	62,219
1920	Atlantic City	3,300	200	136	59,529
1921	Atlantic City	1,189	225	No exhibit	No exhibit
1922	Chicago	4,200	244	141	61,895
1923	Atlantic City	4,404	274	162	75,681
1924	Atlantic City	5,804	330	192	86,349
1925	Atlantic City	7,147	371	204	100,030
1926	Cleveland	8,623	423	271	119,007

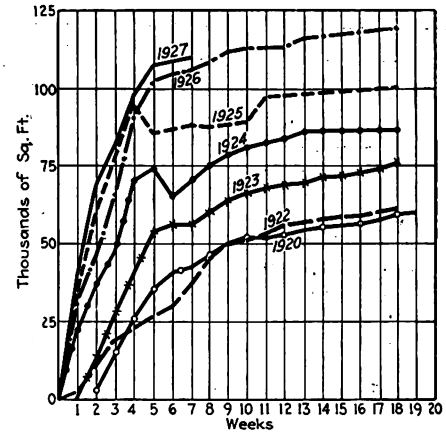






Ten years of progress!

The upper view shows the Atlantic City exhibit of 1916. In the two other pictures will be seen what the manufacturers exhibited at Cleveland in 1926. It is a story of 57,329 sq.ft. against 119,007 sq.ft. Here is conclusive proof of the growth of the industry during an epoch as tense and disquieting as any in American history. Producer and consumer alike have expressed their faith through the years.



A graphic illustration of what exhibit committees have wrought in seven years

tor Dell pointed out that "many a sales manager has questioned the advisability of participating in exhibits. The convincing argument to his question is found in the facts: A.E.R.A. attendance records at conventions with exhibits as compared to registration figures at conventions where no exhibits were held is the answer. The tabulation given elsewhere is a most eloquent argument for exhibits. In making up this tabulation the war years of 1917 and 1918, when only conferences were held, have been excluded."

Westinghouse Favors Newspaper Publicity

J. C. McQuiston of the Westinghouse Electric & Manufacturing Company in an address before the International Advertising Association convention at Denver, June 28, said that his company favors the newspapers to get its story before the public and to secure the good will of the people, which is of paramount importance. He said, in part:

Take, for instance, the electric railway business, which is an important branch of the electrical industry. It is quite as important to Westinghouse to have the public in friendly sympathy with the street railway companies as it is to the street railway companies themselves, for our prosperity depends upon the prosperity of the electrical industry in its entirety. The street railways have a wonderful story to tell the public. Many of us remember the old horse-drawn street car with straw on the floor to keep the car warm. Transportation was slow, distances traveled were short; of comforts there were none, and still the price was a nickel a ride. Then came the cable car with longer hauls, faster time and somewhat more comfort, and still the fare was a nickel. Then came the advent of electricity, until now the cars offer great distance, rapid speed and every convenience of travel and still the public is inclined to complain if the fare exceeds the proverbial nickel.

He mentioned other innovations in the electrical industry, and while the public may take exceptions to charges now and then, it will be inclined to receive increases or decreases more gracefully when it is fully and properly advised about them.

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Six One-Man, Two-Man Cars for East St. Louis Railway

As reported in ELECTRIC RAILWAY JOURNAL for May 28, the East St. Louis Railway, East St. Louis, Mo., has ordered six one-man, two-man, double-end, steel units. Contract was placed for these cars on May 24 with the St. Louis Car Company. Subjoined are preliminary specifications. These units are a part of the company's program for modern rolling stock and they will augment the units recently rebuilt and placed in service on May 11. Full details of the rehabilitation program were presented in the JOURNAL of June 4, page 1,000.

Number of units	5
Type of unit	One-man, two-man, motor, passenger, city, double-end, double-truck
Number of seats	48
Builder of car body	St. Louis Car Co.
City and state	St. Louis, Mo.
Date of order	May 24
Date of delivery	October, 1927
Weight	Approximately 32,000 lb.
Bolster centers	22 ft.
Length over all	47 ft. 3 in.
Length over body posts	31 ft. 4 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. 6 in.
Window post spacing	2 ft. 6 in.
Body	All steel
Roof	Arch
Doors	End, folding
Air brakes	Westinghouse
Axles	Heat treated
Car signal system	Faraday
Compressors	DH-16
Control	K 75-low level
Curtain fixtures	National Lock Washer
Curtain material	Pantasote No. 86
Destination signs	Hunter
Door mechanism	National Pneumatic
Energy saving device	Economy meters
Finish	Enamel
Floor covering	Linoleum
Gears and pinions	Tool Steel Gear & Pinion Co.
Glass	Plate in side windows; non-shatterable in vestibule
Hand brakes	St. Louis Car Co.
Hand straps	Electric Service Supplies No. 26572
Heaters	Consolidated
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain, 3¼ in. x 7 in.
Journal boxes	St. Louis Car Co.
Lamp fixtures	Safety Car Lighting, dome fixture
Motors	General Electric No. 264, inside hung
Sash fixtures	Dura
Seats	St. Louis Car Co., leather reversible
Seat spacing	30 in.
Seating material	Genuine Spanish leather
Steps	Folding
Step treads	Feralun
Trucks	St. Louis Car Co. EIB 64
Ventilators	Nichols Lintern
Wheels, type	Rolled steel, diameter 26 in.
Special devices	Oakelite; National Pneumatic treadles; variable load brake

Roy Hauer Made Mack Vice-President

Roy A. Hauer, manager of the general bus department of the Mack-International Motor Truck Corporation, New York City, has been elected a vice-president of the company. He will continue as general manager of the bus department. Mr. Hauer has been with the company many years and has filled various positions in the field and at the head office.

The Mack company announces also the election of A. C. Fetzer, assistant general sales manager; J. N. Bayne, Newark branch manager; K. M. Blake, New York branch manager, as vice-presidents. Mr. Bayne and Mr. Blake will head the North Jersey division and Greater New York division respectively. O. J. Evers was also elected a vice-president. The elections were effective July 1. William R. Rhoades has been appointed branch manager of the Scranton sales and service branch. The Albany, N. Y., branch of the company has moved from 135 Ontario Street to 1062 Broadway, a new building constructed and owned by the Mack company. This is the fifteenth branch to occupy its own building since this real estate policy was put in force by the company some time ago. The new building on Broadway occupies 56,414 sq.ft. of floor space. F. F. Staniford is manager.

Una Sells Bond Business to Ohio Brass

The Una Welding & Bonding Company, Cleveland, desiring to concentrate its efforts in the commercial and industrial welding field, has sold its rail bond business to the Ohio Brass Company. This includes the entire rights in and to all patents covering the various types of bonds and bond welding processes developed by the Una company and the exclusive right to sell and use the Una welding rods in connection with rail bonding. The patents covering rail joint welding were not included in the sale nor the Una dynamotors.

It is understood that the Ohio Brass Company will continue to supply the field with the various types of Una bonds. This will enlarge the line of bonds available from the Mansfield manufacturer.

Copper Moves in Dull Market

Until July 6 the non-ferrous metal markets had been generally dull, with tendencies toward weakness. On Wednesday, however, an unusually large business was done in copper at 12.50 cents and producers seem confident that a buying movement has started. Lead has been quiet and prices are lower than a week ago. Much the same situation exists in zinc, silver, tin and quicksilver.

Copper producers, according to *Engineering and Mining Journal*, who have been virtually out of the market, quoting nominally 12.625 cents or higher, with one or two possible exceptions, came to the 12.50 cent level July 6. On the other hand, consumers who had hoped to break through the 12.50 cent figure have had little success, although at least one good-sized sale was made at 12⅜ cents for delivery in the New York district and a still larger tonnage was booked for delivery in the so-called Middle West at 12.50 cents. With excellent buying for Connecticut delivery at 12.50 cents today, it seems as though the events of last February and April, when bottom was touched at this figure, have been repeated. Most of the orders today have been for August and September delivery, with a lesser quantity for July.

Five successive days of lower lead prices in London made it necessary for prices on this side to be cut also if foreign ore lead were to be kept out of the country, so the American Smelting & Refining Company reduced its contract price of New York lead from 6.40 to 6.30 cents on Friday, July 1.

Sales of zinc in the domestic market have been in less than normal volume and prices are easier than a week ago. At the same time producers have not endeavored to force an unwilling market, and the decline in price has been comparatively small. There is little profit to be made in smelting $41 and $42 concentrate and selling slab zinc at 6.10 cents and 6.15 cents, and for this reason producers prefer to hold their metal. Mine production in Joplin should be particularly small this week, for the reason that many of the largest properties were closed down for four days or more over the holiday.

The premium on spot and prompt tin continues to decline, October deliveries being quoted July 6 at only about 1¼ cent below spot Straits. The visible supply of tin in the United States was 8,724 long tons at the end of June, compared with 7,709 at the end of May; and in the world, 15,638 long tons, compared with 14,655 a month before. The June shipments of 10,681 long tons were divided as follows: Straits, 7,607; Banka, 1,418; Standard, 1,251; Chinese, 291, and Australian, 114.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	July 5, 1927
Copper, electrolytic, cents per lb.	12.20
Copper wire, cents per lb.	14.50
Lead, cents per lb.	6.30
Zinc, cents per lb.	6.47
Tin, Straits, cents per lb.	64.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.32
Somerset mine run, Boston, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	2.02
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.67
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15-5.20
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.1
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.57

TRADE NOTES

MARSHALL ELECTRIC COMPANY, formerly of St. Louis, is occupying its new factory at Elkhart, Ind., removing its assembling plant and main offices to the Indiana location, where the headquarters, as well as the factory, will be housed. The company is only five years old, but claims the distinction of being the pioneer manufacturer of constant potential battery charging equipment. Thomas Marshall, Chicago, is president. G. H. Fournier, an electrical engineer, is vice-president and general manager.

SHOPS AND BUILDINGS

SPRINGFIELD STREET RAILWAY, SPRINGFIELD, MASS., is remodeling its building in Bond Street, formerly used as a freight terminal, into a garage for its buses. A repair shop and laundry will be included in the establishment. The improvements on the building will cost $15,000.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
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CHARLES GORDON, *Editor*

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An Exhibit for the Maintenance Man

INTEREST in this year's exhibit at Cleveland increases apace. Each day's development points more clearly toward the greatest convention and the most impressive electric railway exhibit of all time. But for the maintenance man this year's convention holds a particular appeal.

During the year discussion of car improvements has become transformed into action. Within the period of the past few months there have been formulated by practically every car builder in the industry plans for developing and exhibiting radical changes from conventional designs. New manufacturers have come into the field and, in addition, many operating companies have gone ahead with experimental work in the improvement of cars. Practically every outstanding development of this kind is expected to be in the exhibit.

Interest in the improvement of cars has been reflected to track and overhead line. In fact, there is considerable evidence that the track manufacturers have been the most alert of all to identify themselves with the demand throughout the industry for better transportation. Improvement of line practice is also entitled to careful study and attention.

For the maintenance man in particular this year's convention should prove a literal mine of ideas and suggestion. It is important that the cost of staging such a stupendous exhibit as this be capitalized to the limit by every man who has the opportunity to attend.

Making Questions Help Standardization

QUESTIONS are being asked so frequently by maintenance men regarding details of repair shop practice, particularly on such subjects as tolerances of refinished parts, that it would appear sufficient attention is not being given to the work of the American Electric Railway Engineering Association. This body, through its technical committees, has done and is doing much to standardize the methods employed in the maintenance and repair of cars, track, line and all other elements of the electric railway plant.

That acceptance of the practices recommended by the association is not universal is indicated by the diversity of replies given by various operating men. Some of them, of course, have practices which have been established over long periods and do not feel that it is necessary or desirable to change. Others, however, are not familiar with the work of the committees and the range of subjects covered in the Engineering Manual, and for that reason are not conversant with the best and latest developments. It is to be noted in this connection that the personnel of the committees includes many men connected with small and moderate-sized properties as well as the largest ones, so that the recommended practices promulgated by them are almost invariably suited for railways large or small.

The association has progressed much in its work. It is even now planning for greater effectiveness, so that standardization of materials, methods and practices can be carried along and always brought up to date as the industry progresses. Questions dealing with practices not already standardized can be of great help to the committees, as they should bring out answers from many operating men that will put before the industry the diversity of methods and will suggest the best means of standardizing.

There Are Many Causes for Flashing of Railway Motors

MANY master mechanics remember the time when the lathes in electric railway shops were kept busy turning out flat spots in commutators. Slotting of commutators and the use of higher grade carbon brushes have overcome this condition. Now that commutator slotting is used so universally, it is difficult to believe that its desirability was ever questioned. The issues of ELECTRIC RAILWAY JOURNAL 25 years ago, however, contain many articles in which the question is debated. Even the engineers of railway motor manufacturers were against the practice of slotting, the argument being that the slots would be sure to collect carbon dust soon and cause short circuits and more trouble than the flat spots that resulted from high mica.

Slotting of commutators has not overcome all railway motor flashing, however, as is pointed out in the article by Jesse M. Zimmerman in this issue. Flat spots sometimes occur on commutators, but now they are the result of poor maintenance. Carbon dust does accumulate and cause trouble, but ordinarily there is no excuse for such conditions, as motors and brush-holder mechanisms can be blown out with compressed air as a part of regular inspection if necessary, and so be kept clean easily.

Poorly maintained brush-holders are responsible for many present-day motor troubles. Sparkless commutation requires that the brushes and commutator keep in continuous contact, with sufficient pressure to permit carrying the maximum current that results from an overload. Dirty brush-holder mechanisms, tight carbon-brush boxes, weak spring tension and shortness of the carbon itself cause sluggish action of the brushes so that they hit the high spots of the commutator only.

The other extremes of worn carbon boxes, loose brushes, heavy brush tension or brushes too long to act properly cause just as much trouble. Looseness permits the brushes to swing off neutral and sparking results. Improper alignment of the brush-holders or incorrect spacing has the same effect.

This is the issue in July that is devoted essentially to maintenance and construction subjects

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Commutator troubles and flashing do not always come from an improper condition in the motor. Anything that produces motor vibration will result in poor commutation. Flat wheels, poor track, improperly adjusted or faulty brake rigging, poor motor suspensions and loose bearings are some of the contributing causes, but all can be overcome easily with proper attention to the maintenance of all car equipment parts.

Contact Lines, Too, Need Modernization

WITHIN the past few years much has been published about modernization of cars and service. Occasionally an article has dealt with modernization of the track. The overhead contact line, on the contrary, has received little or no consideration from the engineers and operators who are preaching the doctrine of fitting the electric railway to present-day conditions. For this reason, if for no other, the article by L. W. Birch appearing in last week's issue of this paper is worthy of study.

Close scrutiny of Mr. Birch's article reveals that it is possible to revamp the trolley system and fit it for high-speed operation at slight expense. It may be surprising to line engineers of the old school to learn that half of the poles of an existing direct suspension overhead system can be removed to the benefit of the line. The cost of material for conversion to the catenary system is surprisingly small, as the article brings out; in fact, the annual cost may be reduced after the change is made.

As to the merits of the catenary suspension there is little argument. It has been developed so that it is suitable for much higher car speeds than was the direct suspension. Hard spots in the wire are absent and hence trolley wheel wear is lessened. The maintenance of the trolley wire should be reduced for the same reason. When one reads of the advantages it seems the more surprising that all the interurban lines and many city properties have not adopted the plan. To say the least, it merits careful scrutiny by every operator of an electric railway with an overhead contact line.

To Be Attractive, Service Must Be Competitive

WHILE on a recent motor trip the writer drove his automobile for a considerable distance along a highway paralleling an interurban electric line. The railway track was on a private right-of-way and was laid with rail of fair weight. There were no grade crossings. Stopping places were not so close together that moderately high speed would have been impossible. The car was modern and should have been able to make good time. Yet its speed, as measured by the speedometer of the automobile alongside, never exceeded 30 m.p.h. The automobile could have been driven considerably faster, even though there was a great deal of traffic on the highway.

Inquiry developed that there is a second rail route between the terminal cities which the company adopted as its high-speed line, reserving the one in question for local traffic. The curves on the latter are not banked for high speed and the track is not maintained well enough to make high speed practicable. But that must be looked on more as an excuse than a reason for the slow speed. If the track maintenance is not good enough to permit of high speed under conditions such as this it is not acceptable to the patrons who must use the road, nor is it good enough to obtain economy in operation, as the slight saving in repairs will be eaten up in higher car maintenance cost. Certainly there was an opportunity to make better speed if the car had been accelerated and braked quickly, even though higher maximum speeds could not be attempted. While the public conveyance which must stop for passengers cannot hope to make the same speed as the individually owned vehicle making no intermediate stops, it has the advantage of a private right-of-way which permits of higher speed while it does run, and the passengers at least can get a thrill out of passing the vehicles on the adjoining congested highway. By making the best speed possible, certainly no passengers will be driven away and others undoubtedly will be attracted. Operating expenses can be but little higher and if the schedule can be adjusted so that a car is saved costs will be materially reduced.

When interurban railway managements learn to understand better the public's desire and demand for getting somewhere quickly, and make it appear that they are straining every nerve to make speed, eliminate waste time and get the patron to his destination on the minute, there is likely to be a change in the belief that the interurban is doomed. Those few roads that have such a policy of appealing to the public have found that it pays.

Another Interurban Stops Drifting

ON APRIL 27, 1926, the Cincinnati, Hamilton & Dayton Railway acquired, through foreclosure, an interurban property that had been in continuous receivership for ten years. To be exact, it acquired 72.95 miles of interurban trackage running through the Miami Valley, from the outskirts of Cincinnati to the heart of Dayton, Ohio, and 13.8 miles of trackage used in giving local street car service in Hamilton, Ohio, a city of approximately 50,000 population. Beyond this and the traffic possibilities of the rich Miami Valley—which have existed for many years—it acquired little more than an obsolete, run-down and decrepit interurban infested with bus competition and ready for the scrap pile. The receiver had heroically endeavored to plow back its limited resources into tie and rail replacements needed to avoid a total suspension of service. The right-of-way had become grass grown and weedy. The cars in use were from thirteen to 30 years old. Most of them were obsolete, uncomfortable and uninviting and excessively costly to operate and maintain. The power supply was likewise obsolete, unreliable and inefficient. The shops were inadequate and crude.

In short, the C., H. & D. acquired a run-down interurban property, which if not typical of many similar properties in the country had at least much in common with them so far as general condition, history and outlook are concerned. Like many similar properties, also, it was the victim of a series of financial manipulations —leases, mergers, consolidations and "recapitalizations" —which loaded upon it a staggering burden of fixed charges and resulted in prolonged litigation among its mortgage creditors.

On June 22, 1927, the Cincinnati, Hamilton & Dayton Railway staged a mammoth civic celebration, which, as reported in the June 25 and July 2, 1927, issues of ELECTRIC RAILWAY JOURNAL, attracted a crowd of people conservatively estimated to have exceeded 25,000, and including financial, business, industrial and civic

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leaders from the entire Miami Valley, together with many leading executives of the electric railway industry. Automobiles blocked the highways for miles in a vain effort to reach the place of the celebration. Residents in all the towns along the line turned out in force to wave and cheer as the company's cars carrying civic leaders passed along the streets. Motormen and conductors alike threw back their shoulders and held up their heads with new pride in their jobs. Newspapers throughout the territory and in many other parts of the state devoted many columns to laudatory comment about the road. Congratulatory letters and telephone calls poured in on the management from prominent people in the territory and the industry.

What had happened in the short period of barely more than a year? Did some fairy wand transform this tottering and cadaverous "streak of rust" into a modern, efficient and popular transportation machine capable of playing a vital and welcome part in the development of the Miami Valley? No, there wasn't anything magical about it. There wasn't anything much different than has brought the same complete reversal of outlook on other interurban properties; on the Chicago, North Shore & Milwaukee Railroad, on the property of the Interstate Public Service Company, on the properties in the South and Southwest under the management of Stone & Webster, on the Buffalo & Erie and on the Chicago, Aurora & Elgin, where Dr. Thomas Conway, Jr., J. H. McClure and their associates, who are now engaged in rebuilding the C., H. & D., brought a tottering railway system from receivership to prosperity and financial credit in three years. A management took charge of the property which had the vision to foresee its possibilities, the courage to spend good money in developing them, and—to furnish the necessary motive and incentive—a direct financial interest in the result.

No, there wasn't any magic. It was only hard business sense. There was confidence in the transportation business. There was foresight. As a result, another interurban has stopped drifting. Those at the helm are steering the only course that lies open to a larger destiny. In their example there is something serious for those to think about who cover up their own timidity and inaction by reciting the difficulties of the interurban, instead of taking steps to surmount them.

Tragic Accidents—The Response to Summer Salvo

ONLY two weeks of the summer passing show—and observers already are turning away with horror from the diorama of tragic deaths due to careless accidents. Whether the 1927 canvass shows any more gruesome shades than in the years previous only the experts can answer. In any event, possible predictions of statisticians for the summer period ended Labor Day, based on the accident toll so far recorded, might well provoke foreboding, if it weren't for the opportunity afforded by a recent proclamation of Governor Smith of New York, and worthy of emulation by other state heads, setting aside three weeks beginning July 18 as Public Safety Period. The period was recommended for stress by teachers, public speakers and clergyman "to the end that greater success will attend the effort to reduce our accident hazard."

Though primarily addressed to automobile drivers, the appeal is really made to every operator of a vehicle in the entire transportation field. With all that has been accomplished in familiarizing the people with the safety language, in profitable rendezvous with Aunty Jay Walker and Mr. Will Livelong, it seems incredible that many people not only remain passive on this vital subject but also continue to turn a deaf ear to what is now a national entreaty. Tragedy, it appears, must make its foray onto their very hearths before preventive measures enter the process of their cerebrations.

ELECTRIC RAILWAY JOURNAL has talked "safety," and not in vain. Let the electric railways continue to make every year a banner safety year as well as a banner business year. The crucial season is on when week-enders are many and vacationists unguarded. Now is the acceptable time for every trainman worthy of his hire to assemble all his mental and physical forces in the expeditious, courteous and careful transportation of passengers to their destination. If recent tragedies in the air have provoked the question whether we are as yet prepared for such chances, no such debatable point arises concerning daring on the highway. Courage and recklessness are not one and the same. An impassable chasm separates them.

A Public Utility Should Set Good, Not Bad, Examples

DISCUSSION now raging in one of the suburbs of a large city is a warning that a public utility cannot be too careful about any acts that make it appear indifferent to the public welfare.

In this suburb growth has been very rapid in recent years. This led to a zoning act which would, as the British say, enhance the amenities of the town instead of making it less attractive. Particular care was directed toward making the business district one in which the run-down frame buildings of a past generation would be replaced by handsome, substantial structures. Much of this development is the main station and right-of-way of one of the railroads passing through the town.

With the coming of electrification it has been found possible to use part of the right-of-way for business buildings. The earlier constructions were entirely unobjectionable. Now a controversy has arisen because the real estate department of the railroad has leased space for a lunch wagon directly opposite the newest and finest building in the community's business center.

Now that protests against this cheapening of the neighborhood have been brought up to the board of directors, the apology is made that the lease was really handled through a local realtor, who might have been expected to know local sentiment. So far, however, the railway has not offered to remove the blotch by reimbursing the would-be restaurateur for his outlay. The latter, of course, has the law on his side, but the likelihood of a boycott should make him amenable to reasonable compromise.

This incident suggests how carefully a public utility should watch its step in any enterprise that contacts with good public relations. No matter how badly it may be in need of additional revenue, it cannot afford to permit itself to become embroiled with the communities through which it operates. It may "get away" with its legal rights today, but when it wants some favor tomorrow it will be astonished to find how many influential citizens have not forgotten that it set an example of bad—or at least indifferent—citizenship.

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In the Wake of the Raging Torrent

NOW the Valley of the Mississippi is in the aftermath of the flood. Desolation stalks in the far reaches of the river that ran wild for weeks. The land of Evangeline is laid waste. As recently as July 1 Secretary Hoover estimated that 59 of the 101 counties inundated were practically out of the water, 22 were mostly out, but twenty were still under water. Approximately 3,500,000 acres of crops were destroyed by the high water, and of these 1,300,000 acres are in the twenty counties still inundated. Little can be done toward producing crops this year on the land now under water. This dire peace-time disaster has claimed a total of more than 600,000 sufferers, who must bear with property damage estimated to be between $200,000,000 and $400,000,000. Of the more than 600,000 persons who became dependent on public support, 555,000 have returned to their homes, leaving only 45,000 yet to be cared for away from home. There are still some 250,000 persons receiving temporary supplies of food, together with feed for their working animals.

THESE are the cold facts reduced to terms of acreage desolated, people prostrated, and money losses sustained. Back of them is the story of the fortitude with which the people are bearing their colossal losses. No other farm lands in America are richer than those in the Arkansas Valley. In the lower Mississippi cotton that should be waist high is only a few inches out of the ground. Corn, the tops of which under normal conditions should be from 5 to 6 ft. high, is less than a foot. It is not all quite so bad as this, but in St. Martinsville not a train whistle has been heard for nearly two months, and it was not until June 30 that automobile traffic there was possible. In the parish of St. Martins, the heart of the Evangeline country, hundreds waited in file on July 9 in the bread line before a garage which the Red Cross was using as its relief headquarters. The descendants of the Acadians are proud people. They were ashamed to be there, but there was no alternative. Nearly everybody had lost his all. Out in the open Father Peeters said mass in French. Only the fortitude of faith sustains many of them. It is against his will that the Acadian has had to become a ward of the Red Cross. Even Mr. Hoover has been unable to convince him that by so doing he did not become a receiver of alms.

But the work of succor is being carried on. The resources available for relief have amounted to approximately $26,000,000. Of this total $16,000,000 came through the Red Cross funds raised by popular subscription, $7,000,000 represents outlay of the federal government in equipment and supplies, and $3,000,000 represents free railway transportation of supplies. Of the Red Cross funds some $3,000,000 remains in a reserve which is expected to be sufficient to provide until the end of October for the needs of the twenty counties still flooded. An additional sum of $1,600,000 raised from various sources will be used for a campaign against malaria and other forms of disease to which the flood has made that region particularly susceptible.

WITH the slogan "Rally for Rehabilitation," the public utilities of Louisiana and Mississippi are actively co-operating with the agricultural and educational authorities of the two states to hasten restoration in the flooded sections. The medium for this work is "Miss Lou," the information bureau conducted by the utilities to tell the people the facts about their problems and progress, and to forward the prosperity of these states in every way. To this end the committee has employed W. I. Smith, a man thoroughly acquainted with the territory by birth and breeding, a trained writer, and an experienced teacher. He is now working under instructions from Prof. W. R. Perkins, director of Agricultural Extension at L. S. U., and Superintendent T. H. Harris, head of the public school system in Louisiana. The expense of this work is completely borne by the public utilities contributing to the Miss Lou Committee, of which H. B. Flowers is chairman and C. P. Couch vice-chairman. Both these men are well known in electric railway and other utility circles. They ask the full co-operation of all newspapers in both Louisiana and Mississippi and the aid of business leaders in the communities affected, to the end that farms and schools may be successfully rehabilitated without costly delay.

GRIEF, of course, is personal. It can be made endurable and prevented from becoming tragedy only as human agencies rise to a proper appreciation of the need of the work of succor. The agencies of mercy have done heroic service in the devastated area, but much still remains to be done. This is the reason for the plea of the representatives of the public utilities, "Rally for Rehabilitation!"

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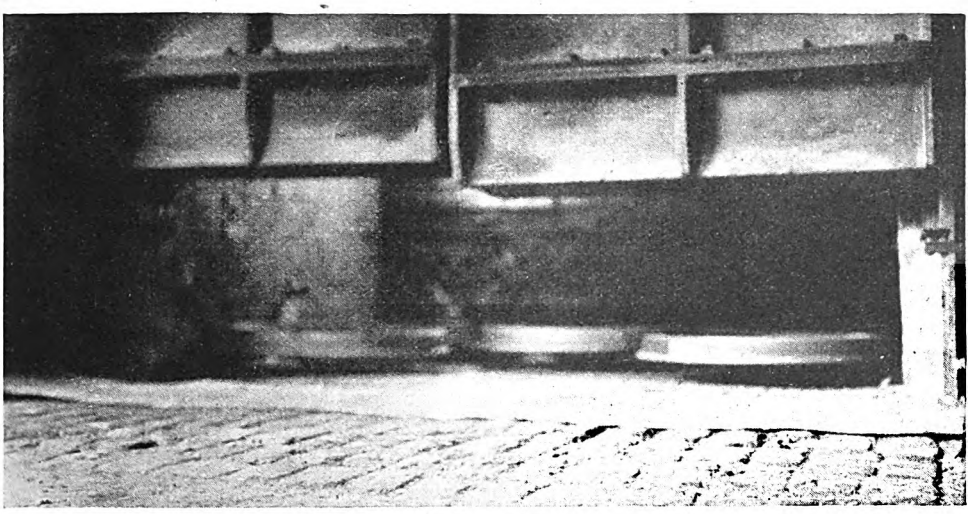


Five steel wheels are heated in the annealing furnace at once. This picture was taken by the light of the wheels and the interior of the furnace

Heat Treatment

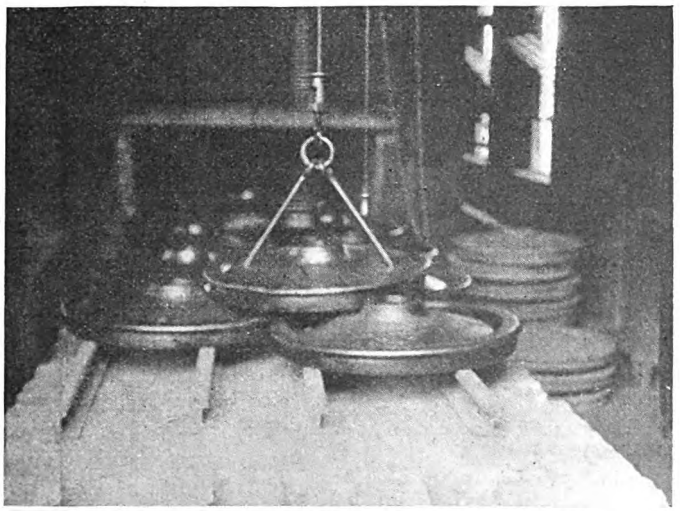
Eliminates Wheel Failures

Process of hardening and tempering rolled steel car wheels has been developed by Twin City Rapid Transit Company. Wear is reduced and so far no failures have occurred

HEAT treatment, which has been used quite extensively for car axles by the Twin City Rapid Transit Company, has within the past few months been developed for the preparation of new rolled steel car wheels. At present no wheels are being used without the treatment.

Prior to the adoption of heat treatment, there had been a certain amount of difficulty due to failures of the steel wheels, particularly during the severe winters that are experienced in Minneapolis and St. Paul. Usually a crack would begin at the periphery, extending to one of the four holes drilled in the web, after which the fracture might extend completely around the wheel unless detected during inspection. A few fractures also occurred in the hubs, although these were much rarer.

Ordinarily, the fractures in untreated steel develop soon after the wheels go into service. They become apparent at once or when the wheels are returned to the shop for truing up after the first 13,000 to 15,000 miles of operation. A few more become apparent after the second dressing at 26,000 to 30,000 miles. If the wheels have not failed at this point there is little likelihood that cracks will develop before the tread is worn out. Thus it would seem probable that failure is due to shrinkage strains set up in the metal in the process of manufacture rather than to any condition developing from operation under the car.



Ten wheels, after heating and quenching in oil, are placed on a truck and run into the annealing oven for tempering

Some four years ago the heat-treating process was worked out for axles, resulting in a marked reduction in failures and decrease of wear. Accordingly W. J. Smith, master mechanic, decided to develop a similar process for the treatment of rolled-steel car wheels. Approximately 1,000 wheels were

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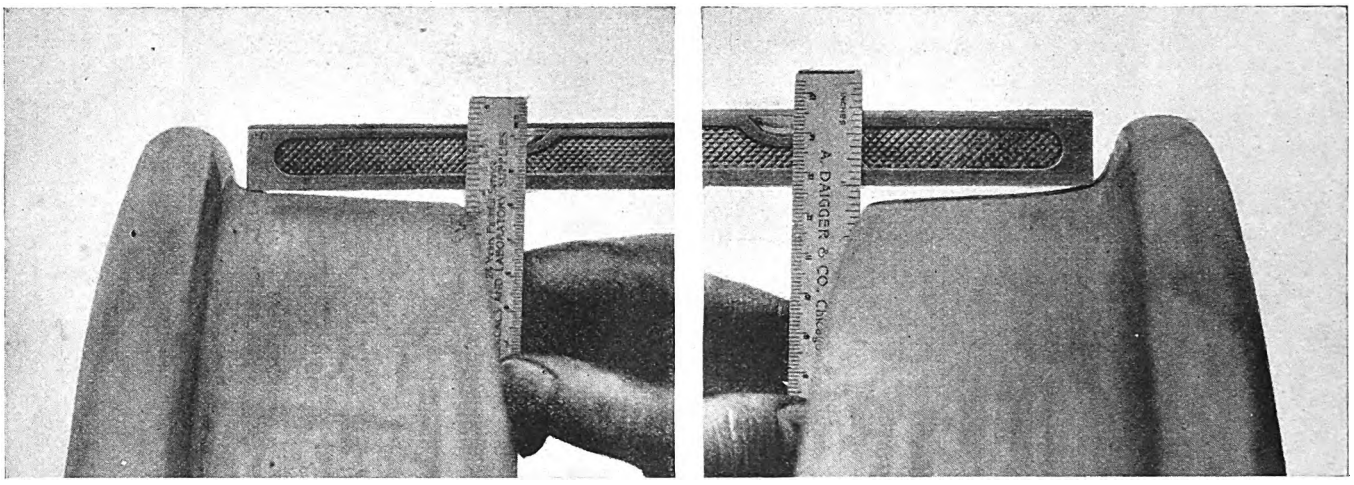
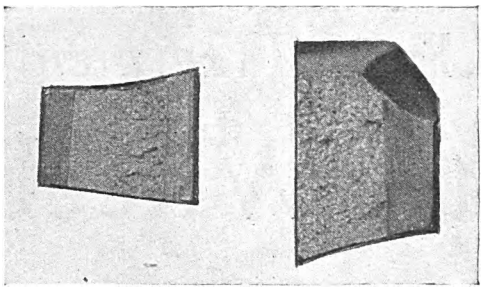


Relative wear may be seen from these illustrations of wheels mounted on a single axle. At left, heat-treated wheel; at right, wheel without treatment



Fractures of steel car wheels. At left, heat-treated metal; at right, metal without treatment

treated, and at present the first ones have seen 50,000 to 60,000 miles of service. As yet there has not been a failure of a treated wheel. This excellent record led to the decision to give heat treatment to all wheels used by the company.

A standard procedure for the preparation of wheels has been worked out under the supervision of David Tissing, testing engineer, which is as follows: The rolled-steel wheels, when received from the manufacturer, are stored in the yard adjacent to the furnace room so that they can readily be rolled in by hand. They are first placed in a furnace fired with crude oil and heated to a temperature of 1,450 to 1,475 deg. F. This takes about two hours. The temperature is watched carefully, being taken by a recording pyrometer. When the indication of the pyrometer shows that the proper temperature has been reached, the wheels are inspected by eye to see that all parts are evenly heated.

The appearance of the wheels in the furnace is shown in one of the illustrations. The wheel is quenched down to a temperature of 400 deg. in an oil bath, the oil being circulated by a motor-driven pump and cooled in a tank on the roof.

Following the quenching, the wheels are placed in an annealing oven and the temper is drawn by heating to 1,000 deg. This is controlled by a recording pyrometer and takes approximately two hours. The heat is then cut off and the wheels are allowed to cool for fifteen to twenty hours.

At present the schedule calls for treatment of twenty standard 34-in. wheels a day. The heating furnace holds a charge of five wheels. Two heats are made in the forenoon and the ten wheels are laid aside. The annealing furnace is opened after the lunch period at noon and the previous day's charge of ten wheels is removed, after which the new charge of ten wheels that were heated and quenched in the morning is placed on a truck and run into it. One of the illustrations shows the ten wheels ready to be run into the annealing furnace. The furnace is then sealed and the heating begun.

The ten wheels that have undergone the heating treatment in the afternoon are placed, after quenching, back into the furnace in which they were heated. The heat remaining in this furnace is sufficient to bring them up to the required temperature for annealing, so that additional heating is not required. They are allowed to remain in the furnace over night, and are ready to be withdrawn in the morning. In this way the heat is conserved and only half the heat is needed for the anneal.

Wheels produced by several of the leading manufacturers are being used. A typical analysis of the steel used shows the following composition:

	Per Cent
Carbon	0.73
Manganese	0.75
Phosphorous	0.037
Sulphur	0.034
Silicon	0.23

The change in physical properties incident to the treatment may be seen from the following comparative tests made on a typical wheel before and after treatment:

	As Received	Heat Treated
Tensile strength, lb. per sq.in.	125,600	158,050
Elongation in 2 in., per cent	10.5	13.5
Reduction in area, per cent	14.9	35.7
Brinell hardness index, front face of rim	260	311

The most marked change due to the treatment is the increase in ductility, as shown by the much greater reduction in area. The change in properties may also be seen from the illustrations. The fracture shows a striking reduction in size of the crystalline structure, indicating a more homogeneous material.

In regard to wear, the treated wheels have not been in service a sufficient length of time to get any average figures. For purposes of comparison, however, an axle was fitted with two wheels of identical make and composition, one of which was mounted as received from the manufacturer and the other first given the heat treatment. This set was placed on a car in service. Since the wheels had to rotate at the same speed, there was a tendency to equalize the diameters, although the wear at the outside of the tread was almost 50 per cent greater on the untreated wheel, as seen in the illustration.

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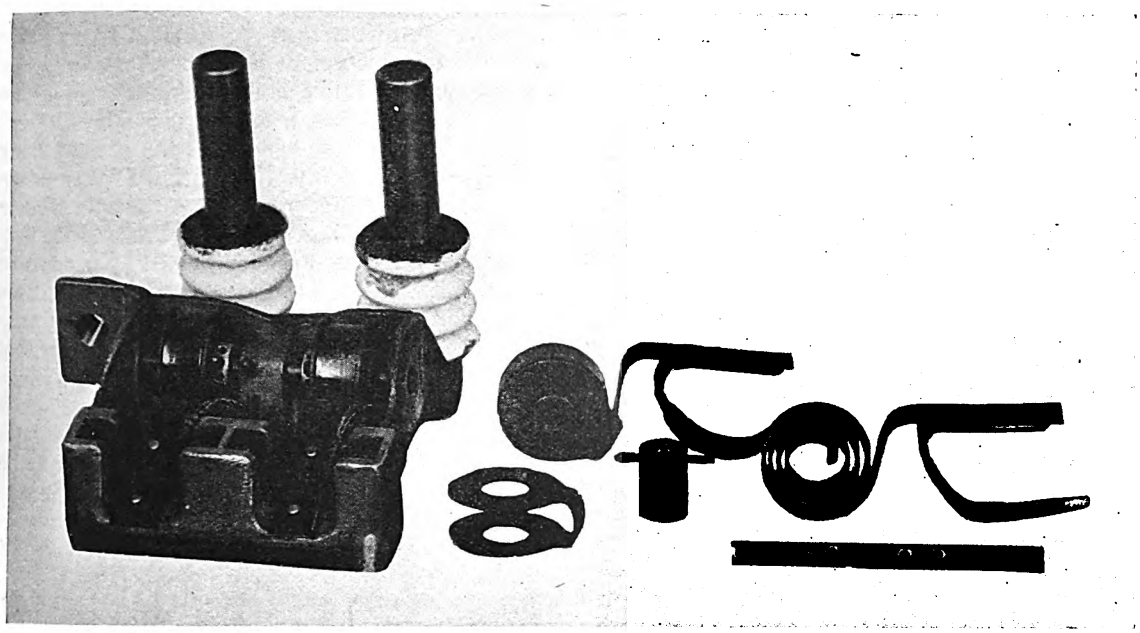

Brush-holder for Westinghouse type 333 motor rearranged to use twin-washer mechanism

Good Maintenance Produces

Improved Commutation*

By Jesse M. Zimmerman

Renewal Parts Engineer

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

GOOD commutation means a reduction in operating expenses. Two of the benefits derived are: (1) Commutator and brush wear are less. In addition to the money saved on commutator and brush replacements there is a reduction in copper and carbon dust accumulation in the motor. This dust forms a good conductor and often causes the insulation of the armature or field coils to break down; (2) roughening of the commutator is avoided. A rough commutator causes vibration which leads to unnecessary wear of the brush-holder as well as chipping and breaking of carbons.

Good commutation can be obtained only by eliminating flashing and sparking. Flashing is caused by the establishment of an arc between the brush or brush-holder and a commutator bar, and which is maintained by a high voltage. Since an arc always vaporizes the copper where it starts, it will stick to that bar. As the rotation of the commutator carries the bar away from the brush-holder, the arc either is extinguished when the distance is so great that the voltage cannot maintain it or when the voltage behind the arc is great enough it carries over to the brush-holder of the opposite polarity. It is the purpose here to deal with the mechanical causes of these arcs and not with the theoretical principle involved.

If it were possible to eliminate all sparking and arcing from the commutator face one could feel very much at ease concerning motor flashing. Many cases of flashing have been eliminated by proper maintenance of brush-holders or by increasing the brush tension, if the field and armature coils are installed correctly with no shorts or open circuits, and the control circuit is connected properly. Broken brush springs and sluggish mechanisms are serious offenders, as they allow the brush to leave the commutator face when the motor is running at high speed over a rough track. All brush springs should be inspected carefully and replaced if broken or weak. If the mechanism is sluggish it should be removed so that the moving parts can be cleaned, and all badly worn parts should be replaced. Usually the brush tension should be set from 5 to 7 lb. per square inch, sometimes as high as 10 lb., depending on the type of brush-holders, condition of the track or other service conditions. A careful study will determine the proper

*Ninth and last of a series of articles on commutators for railway motors. The others were published as follows: "Choosing Materials for Railway Motor Commutators," Aug. 21, 1926; "Important Considerations in Replacing Commutator Bars," Oct. 23, 1926; "Accurate Machining of the V's of Assembled Commutators Is Essential," Nov. 20, 1926; "Mica V-Rings and Bushings Have Important Functions in Commutators," Dec. 18, 1926; "Methods and Equipment for Efficient Assembling of Commutators," Jan. 15, 1927; "Soldering of Railway Motor Commutators," Feb. 19, 1927; "Preventing Flashovers Is an Important Part of Commutator Maintenance," March 19, 1927, and "Turning and Slotting Commutators," April 16, 1927.

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brush pressure. If the roadway is in bad condition, the speed of the car high, or the brushes light it may be necessary to use a brush tension of from 9 to 10 lb. per square inch.

Use of a mechanism where the movement is confined to the spring has eliminated the trouble experienced from sluggish operation. There are no moving parts to wear and cause poor alignment; also the parts to be maintained and replaced are few.

Incorrect brush spacing will cause vicious sparking. On a four-pole motor the brushes should span one-fourth of the commutator bars. Usually on a railway motor the center of the carbon brush box is aligned with the center of the main pole. In repairing carbon boxes or replacement of brush-holders this position should be checked carefully. If there is any doubt as to the correct location of the brushes the motor manufacturer should be consulted.

Worn carbon boxes will allow the brushes to swing off neutral, thus provoking sparking. Worn boxes should be repaired or replaced, as loose carbons will vibrate and chatter. On the other hand, if the carbon is tight in the box its action will be sluggish, so that it will tend to hit only the high spots on the commutator face instead of following any irregularities. When using standard brushes the clearance between the brush and the side of the carbon box should be from 0.002 in. to 0.010 in. for the length and from 0.001 in. to 0.002 in. for the width of the carbon way. These are the manufacturer's allowances for new brush-holders and new brushes.

If commutation is poor it may be improved by using a good brush. Also when the brushes are too long the effective force of the spring is reduced greatly, which also happens when the brushes are worn too short.

A commutator may cause flashing directly or indirectly. A commutator worn to a small diameter will flash at a lower line voltage than a new one. This was demonstrated very clearly in tests by decreasing the diameter of a commutator and lifting the brush to make the motor flash. When the commutator was the original diameter the motor would not flash at a high voltage, such as occurs near a substation, but with the commutator worn to a small diameter it would flash. This test was carried out with the same armature winding and commutator.

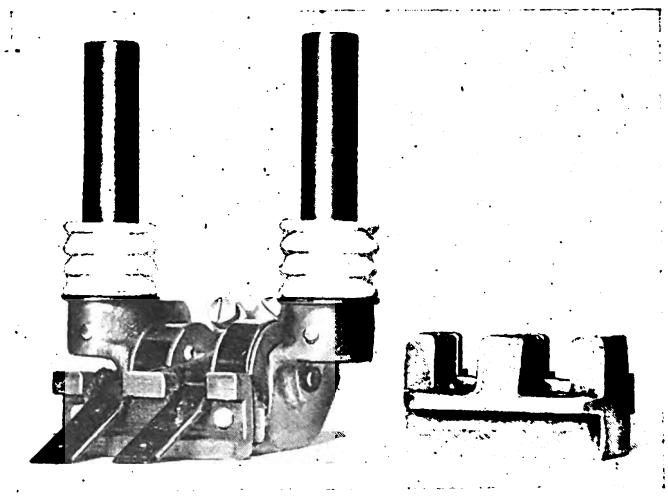
Sharp edges are undesirable on the face of the commutator, as any vaporization will concentrate there. Since the contact area is so small there will be little or no cooling effect on the arc which causes the vaporization. Therefore, all corners of a commutator should be turned to a radius of $\frac{3}{16}$ in. In handling a commutator, burrs at sharp edges should be avoided as they induce shorts between bars.

Sharp edges remaining between bars when the commutator is undercut should be rounded off by drawing a three-cornered file across slots between bars.

Sparking due to vibration of the brushes over rough commutators is inimical to good commutation as well as to the life of the brush-holder. Bars high or low due to looseness should be eliminated by heating the commutator and tightening the commutator nut after subjecting the detachable steel V-ring to a pressure of from 20 to 30 tons. The brush surface should then be given a smooth polish. This has been discussed in the fifth of this series of articles.

Flat spots are another cause of brush vibration. They often are caused by heavy currents flowing through the armature before it starts to rotate. If the flat spots are at the exact spacing of the brushes, one can usually trace the trouble to faulty brake rigging, as when the brakes on one side of the truck do not release until the car starts. Under these conditions the brake rigging should be inspected carefully. Many times flat spots are caused by a heavy starting current due to rapid feeding of the controller or starting before the brakes have had time to release. Flat spots are also caused by poor undercutting of the mica. When the mica is high, the brush will ride on it, burning away the copper. If the mica is high in only a few places the burning will cause flat spots.

Anything which permits the motor to vibrate tends to cause the brushes to jump with resultant flashing. Worn armature bearings are one cause of vibration, especially if the motor is in a car that must operate over a rough track. Flat wheels also cause excessive vibration. These conditions can be altered by better maintenance. If, however, a car must be operated over a rough track



Twin-washer mechanism applied to a new detachable box brush-holder for Westinghouse type 306 motor

and better motor maintenance does not prevent flashing, then the schedule speed should be reduced. It may be necessary only to reduce the speed at points along the route where the motor flashes badly. A careful study may locate these points and the motorman can be instructed to coast across them.

Oil is deadly as it penetrates the bond between the mica splittings in the V-ring and in the strips between the bars. When the commutator heats from flashes and sparking the oil will carbonize. This causes a creepage path from bar to bar or from the commutator bars to ground, which will eventually become a direct short and a hole will be burned in the mica V-ring. A short between bars may be caused by oil in the mica strip. It may produce pitting and burning between bars at the surface of the commutator, or it may not be visible. The latter is more dangerous as the commutator must be dismantled before the short can be discovered and removed.

Flashing from the front of the commutator bars to the front steel V-ring is due largely to the presence of oil, carbon dust and moisture on the mica V-ring. This tends to collect dirt and dust. It forms a creepage path to ground for the vaporized copper to break down the insulation of the air, thus causing a flashover. Obviously to minimize this trouble the mica V-ring should be kept clean and the surface as smooth as possible so the dirt

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will not adhere to it. Mica V-ring protection was discussed in the seventh article of this series.

Arcing between adjacent commutator bars is an initial cause of vaporization. The phenomena called "ring fire" is known the best. It occurs when a conducting material such as graphite is scraped from the brush by high mica and deposited on the mica or between the bars, causing a short circuit. By carbonizing in the mica, oil in or on the commutator will intensify ring fire, which will continue until the mica is burned from around the piece of carbon. This action is usually called "pitting." The intensity of ring fire is dependent on the maximum voltage between bars and the resistance of the armature coil. It may become so intense that the copper will vaporize, forming minute beads on the ends of the bars or burning cavities in the copper next to the mica. If the voltage between bars is sufficient to maintain the arc a conical shaped cavity will be burned in the copper. These arcs are explosive and resemble small "buck-overs." If the vaporization breaks down the air insulation where the difference of potential is high a general flashover will occur.

Interruption of the power circuit and re-establishing it suddenly unbalances the magnetic circuit, causing spitting at the brushes. If there is any indication of bad commutation prior to this spitting a flashover may occur. Violent spitting may itself cause a flash. Therefore it is necessary to determine the cause of the power circuit interruption. One cause is due to the motorman permitting his car to pass with power on over a section breaker in the contact line. This trouble can be prevented by proper instruction and obedience to rules.

Broken rail bonding which causes a dead section in the return circuit, breaks in the third rail or bouncing of the trolley are three conditions which should be investigated carefully. Wooden guide troughs in tunnels or underground crossings are offenders because the trolley tends to ride the wooden trough so that each time a support is passed an arc is formed. Even though the motor does not flash over there will be spitting at the commutator every time a support is passed.

Rapid feeding tends to make the motor spark and spit. Operating the car down grade at high speed with power on may also cause flashing, especially on rough track. These conditions can be remedied by instructing the motorman properly as to the troubles resulting from careless handling of the car and how he can overcome them.

In discussing this subject R. E. Hellmund in an article in the *Electric Journal* makes the statement:

> The subject of flashing would not be complete without reference to two conditions of operation under which almost any rational motor design is liable to flash. The first is that motors are at times subjected to very high over-voltages; it has been found, for instance, especially in third-rail installations, that when a heavy load is suddenly taken off the line, voltage surges up to two to three times the line voltage may occur. It would hardly be possible to design commercial motors that would stand this under any condition of load without flashing under over-voltage conditions; however, the effect is usually negligible. This is probably due to the fact that high voltage surges are usually of very short duration, so that the flashes caused and maintained thereby do not have time to do much burning; usually the damage due to flashing consists in very slight heating of the commutator bars without affecting the service given by the motors in any way. The damage caused by voltage surges through insulation breakdown may, of course, be quite serious.
>
> Another cause which will make practically every motor flash at times, and which often results in serious damage to the motors, is the practice of throwing the reverse handle of a four-motor equipment car while it is running at a fairly high speed, commonly known as bucking the motors. With the motor connections established under these conditions it is possible for the motors to pick up as generators under practically short-circuit conditions. It seems that the rush of current in his case is so big and the building up of the flux so rapid that the voltages referred to as inductive and self-inductive are very high, and will, together with the effects of field distortion, nearly always cause a severe flashover if the motor is running at fairly high speed. Even if it were commercially possible to design motors that would not flash in this case, it would hardly be worth while doing, because the torque exerted by the motors when they are bucked is so great that it unduly strains the gears, shaft and other mechanical parts. For this reason alone the practice of throwing the reverser handle while running should not be tolerated, except possibly in order to avoid accidents and damages more serious than the burnout or breakdown of a motor.

A weak field due to a short-circuited coil will result in poor commutation because it has a damping effect that tends to oppose a sudden change in the magnetization. A reversed main field coil also reduces the field flux. Field-control motors are sometimes so connected that the additional field winding is in circuit for the running position, overloading that particular motor. A motor operating with a weak field is overloaded, and has a very sensitive neutral commutating zone, so that it will flash more easily than if it were operating with a strong field.

Shop Work Centralized

An addition to the general repair shops of the Washington Railways & Electric Company permitted concentration of repair work at one location

PRIOR to September, 1919, a large portion of the motor, truck and wheel repair work for cars of the Washington Railway & Electric Company, Washington, D. C., was done at eight different carhouses. These are located around the system at widely separated points, as can be seen from the accompanying map. The doing of work at so many locations made it necessary for the daily transportation by motor truck of materials involved in these repairs between the general repair shops and the carhouses. This proved unsatisfactory for several reasons. Armatures and fields were sometimes damaged in transit and in the work of installing, which, together with other repair work, was necessarily done by men who were essentially carhouse workmen and were not trained properly in this class of work. Supervision lacked care, since the carhouse foremen were unable properly to inspect and test these cars after repairs, their time being taken up with other details necessary to proper inspection of car equipment.

The designation of the eight carhouses, together with the number of miles which separated them from the main repair shop and information as to the number of cars maintained at each carhouse, is given in the accompanying table.

CARHOUSES AFFECTED BY CENTRALIZATION PLAN AND MILEAGE FROM THE GENERAL REPAIR SHOP

Name of Carhouse	Distance from General Repair Shops in Miles	Number of Cars Assigned
East Capitol	4	116
Eckington	3	86
Columbia	4	50
4½ Street	3½	50
Eleventh Street	3	43
Brightwood	6	48
Tennallytown	4½	30
Great Falls	1½	25

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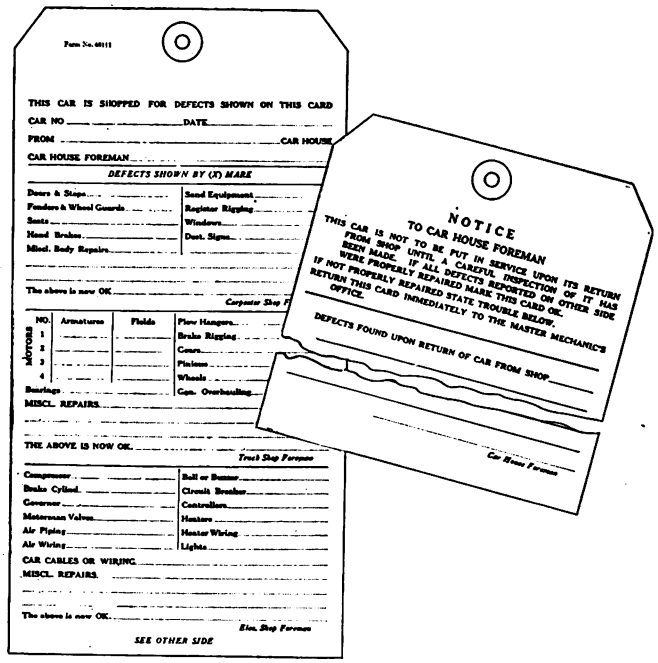


Tag used for reporting car equipment defects which are to be repaired in the general repair shop

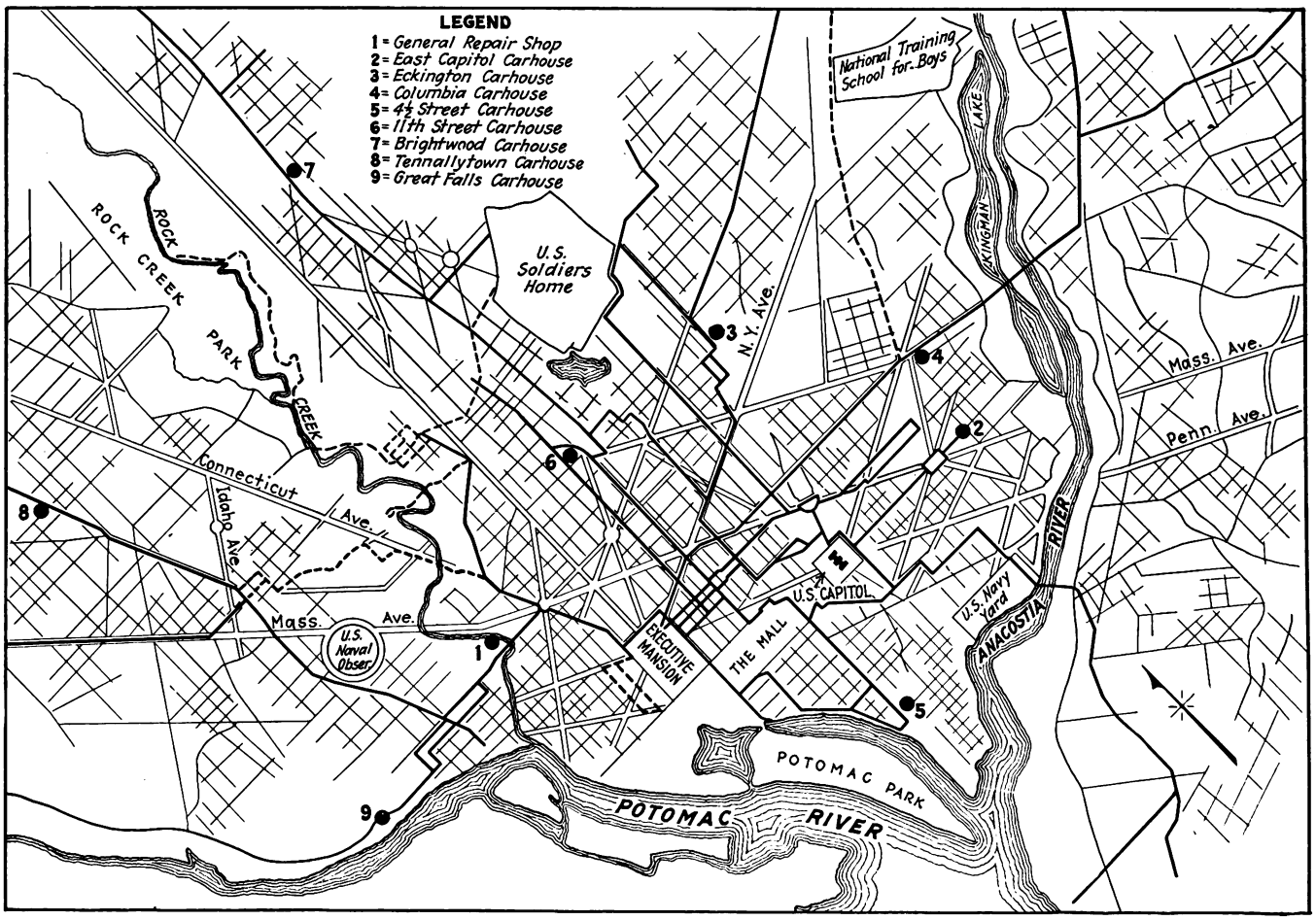
With these facts in mind it was decided early in 1919 to build an addition to the general repair shops at 24th and P Streets so that all repairs to car equipment could be made there. This addition, shown in the accompanying drawing, cost complete $26,000.

The building is of brick with a concrete roof. It is 90 ft. long and 42 ft. 4 in. wide. Each of the three open pits accommodates one car. The floor throughout the building, including the pits, is of concrete except in the section where trucks and motors are overhauled, which has a floor of wood blocks. Each pit is equipped with a Columbia motor-driven car hoist. Two heavy jib cranes, each with a Sprague Electric Company 1½-ton hoist, serve the work floor. These are found ample to care for the three tracks. Particular attention has been given to heating and lighting the building.

Since the shop has been in operation the results have been very gratifying. The only disadvantage of the centralization of work is the extra dead mileage and cost of switching cars between the carhouse and the shops. To offset this, the company was able to dispense with the services of 26 men in the mechanical department as a direct result of the centralization. There has also resulted a large decrease in equipment failures since the new plan went into effect, largely because the men can concentrate on the class of work for which they are particularly qualified. Carhouse forces are now permitted to do only inspection and lubrication and to make slight repairs. As a result inspection work at the carhouses has improved, for the men and foremen can concentrate on it.

The big decrease in yearly maintenance cost with the centralized plan can be seen from the graph. The number of armatures rewound yearly has decreased from 275 in 1919 to an average of but 100 in 1923-26, but of course the reduction actually attributed to the centralized repair work is somewhat less, as other improvements in maintenance methods have also been made.

Before a car is shopped for any reason it is inspected by the foreman of the carhouse where it is assigned. The foreman reports on a tag all defects noted. An accompanying illustration shows this tag, which provides



Map of Washington, showing location of various carhouses and general repair shops of Washington Railways & Electric Company

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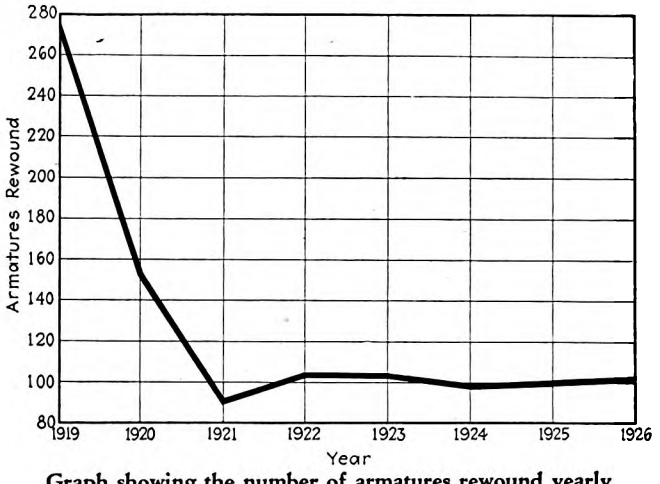
Graph showing the total yearly cost of motor maintenance for the Washington Railway & Electric Company's system



Graph showing the number of armatures rewound yearly since 1919 in the shops of the Washington Railway & Electric Company

space for the most important parts of the body, trucks and motors, subdivided into groups for work to be done in the truck shop, carpenter shop, electrical repair department and air equipment department. When filled out by the carhouse foreman the tag is attached to the car.

When the car arrives at the shop each foreman responsible for the repairs listed on the tag makes a note of the work to be done. When repairs are done and final inspection is made he signs his name in the space provided. He also reinspects the car for defects that may have been overlooked by the carhouse foreman, and notifies the office of any defects which he finds.

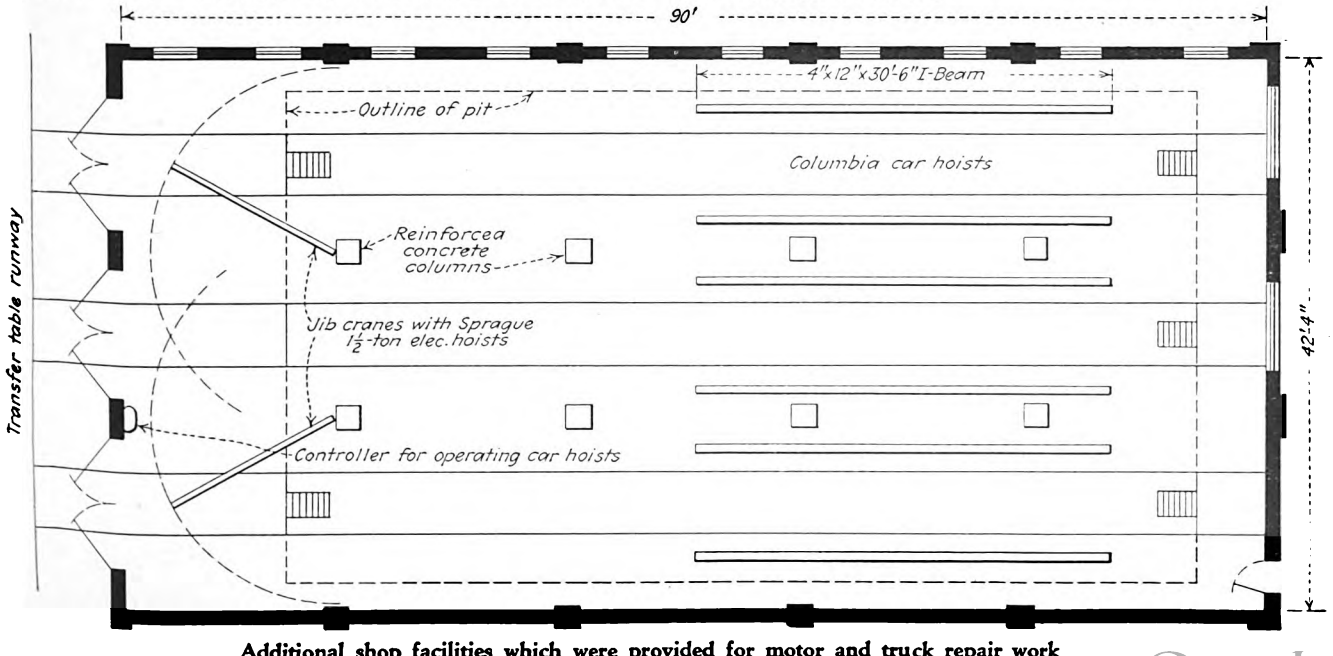
The tag stays in the car until it goes back to the carhouse. The foreman there examines the car thoroughly to see if the defects he reported have all been properly repaired. He then either marks the tag "O.K." on the back or indicates in a space provided any defects remaining. The tag is then sent to the office of the superintendent of equipment. It is filed if O.K., but if any defects have been found in the work they are discussed with the foreman who had charge of that particular job.

Besides the increased facilities provided in the repair shop there is a motor overhauling shop with three tracks, each with a hydraulic car hoist. Over the truck overhauling floor there is an I-beam with carrier and hand-operated hoists. Motors are overhauled on a bench placed in the center of the floor in line with the middle track. This is served by an electric hoist, traveling on an I-beam.

Two-man cars are overhauled on a 65,000-mile car basis and one-man cars are shopped at 55,000-mile intervals. This overhauling basis is varied somewhat by conditions as reported by carhouse foremen.

The car bodies are gone over thoroughly and all electrical apparatus and air brake equipment are cleaned and repaired where necessary. Cables are cleaned, inspected and painted. Trucks are inspected thoroughly for loose and worn parts. Electric arc welding is used wherever practicable to build up worn parts. Axles are removed, tested for flaws and wheels or gears are replaced when necessary. The motors are opened and armatures are rebanded, dipped and baked. New bearings are fitted if necessary. Motor housings, both armature and axle, are washed clean in a hot alkali bath before being sent to the machine shop. Where motor fields are found dried out, damaged or burned they are removed and retaped or repaired.

When the fields are reassembled in the motor frame final tests are applied to the whole equipment. The motor frame is preheated, filled with varnish and allowed to air dry. This keeps out moisture and oil and holds the fields tight in the frame, reducing insulation breakdowns due to vibration.



Additional shop facilities which were provided for motor and truck repair work

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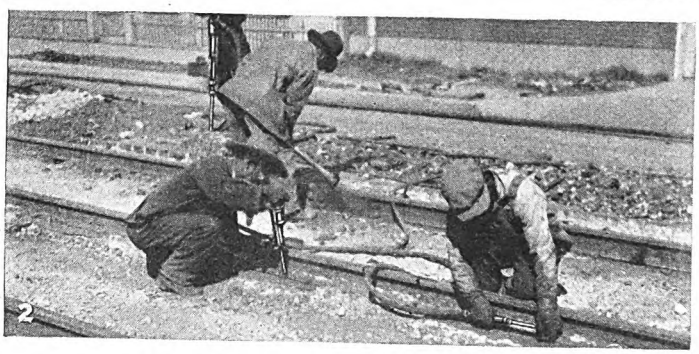
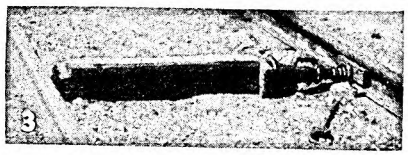
Track Reconstruction Methods *used in* El Paso

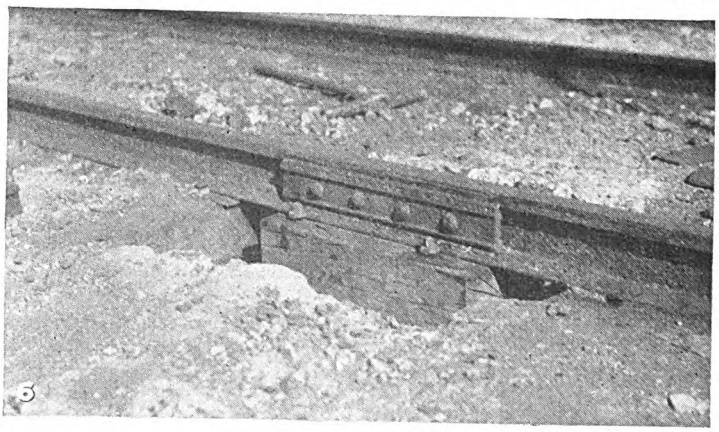
No. 1. At the left the concrete breaker is excavating under failed joint. At the right material is being chipped from the rail flange.

No. 2. Compressed air tools are of great assistance for scaling and chipping operations.

No. 3. Blocks and a screw jack are used to push the rail over to true gage.







No. 4. Method used to remove the cement mortar from the web of the rail.

No. 5. Rails are welded to the ties. The joints in this illustration have been blocked and the straps welded some time in the past. As the joints are solid, they require no attention in the present reconstruction.

No. 6. A joint blocked and fastened to rail with screw spikes. Continuous joint straps are sheared off, turned upside down and welded. The wooden ties, such as appear in the illustration, were used on a short section of the original installation.

No. 7. Hand grinder used on built-up joint.

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Tamping and mopping cold-patch joint to finish paving job. W. N. Hardeman, resident engineer, El Paso, for Stone & Webster, Inc., inspecting the job

Effective Track Repair Methods

in El Paso

Rails were welded to steel ties. Paving was replaced with one course of rich concrete. Joints between concrete and bitulithic pavement were filled with asphalt cold-patch mixture

AN ELECTRIC railway repair job which includes several unusual and interesting methods is now being carried out on about 1 mile of double track along Myrtle Avenue in El Paso, Tex. The 12-in. wood block header courses had disintegrated along both sides of the rails, the gage of the track spread over ½ in. and many joints failed. The primary cause of the trouble was due to loosening of clips and rail fastenings on the steel ties on which the rails were laid.

The steel ties were bedded in a 9½ to 10-in. concrete course which extended to within 2 in. of the top of the 90-lb. A.R.A. rail. The paving course consisted of 2 in. of bitulithic pavement with wood block headers. The web of the rail was protected by a cement mortar filler. Loosening of the clips and tie fastenings had allowed movement of the rail with respect to the tie. This movement caused failures of the wood block header courses and resulted in water getting into the ties and rails. Corrosion then aided the general disintegration.

The paving and concrete courses are now being excavated down to the tops of the ties and the rails are being welded to the ties. Concrete under the failed joints is being excavated and the joints are boosted on white oak blocks, 8x10x24 in. The blocks are ballasted on crushed rock and are fastened to the rail with screw spikes. The flange angles of the old continuous joint straps are sheared off with gas torches and the straps are turned upside down and welded to the rail with electric welders. Compressed air equipment is used for excavating, removing scale from ties and rails and for cleaning joints previous to welding. Cupped joints are built up and are ground to a true surface. The grinding operation consists, first, of the use of small hand grinders, followed with a reciprocating grinder.

In the reconstruction work the spread in the track gage is corrected first by aligning the rail and then welding it in place. One rail is started, after which the lugs and wedges are removed from the ties under the other rail and it is moved to true gage by means of blocking and screw jacks. The rail seams of the second rail are then welded to the ties.

The paving is replaced with one course of rich concrete. A mix of approximately 1 : 1½ : 2½ is used. The joint between the concrete and the bitulithic street pavement is filled and surfaced with a "cut-back asphalt cold-patch" mixture made up by the construction forces.

The entire work is being done without interruption to the movement of electric cars, which at this point have a headway of about four minutes. This feature of the job is a source of satisfaction to the El Paso Electric Company, which operates the line, since the company desires as little interference with service as possible.

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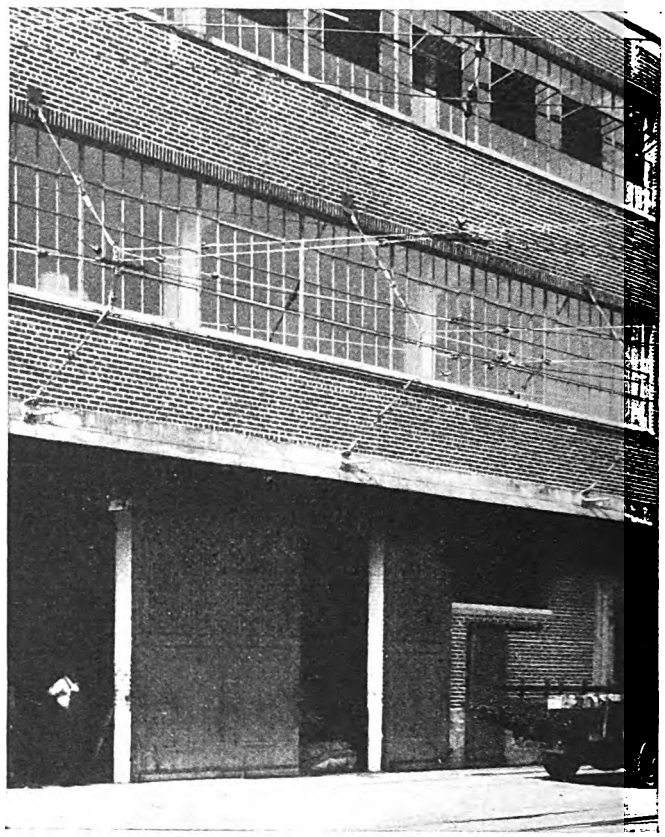
Special Overhead Construction Necessitated by New Building

CONSTRUCTION of a storeroom and distribution building for the Memphis Street Railway opposite its carhouse necessitated the removal of the trolley poles and the rearranging of the overhead trolley special work at that point. It was decided to fasten guys from the trolley frogs to the building at a distance of 20 ft. above the ground. To allow for sag between the two buildings, bull-ring guys for supporting the special work were fastened 22 ft. above the ground. This method of construction was complicated somewhat by the new building having a row of windows along the front at the place needed to fasten these guys.

It was decided to use a special arrangement at the building and provide anchors above and below the windows. During the construction of the building 5/8-in. bolts were placed in the wall. At each point where an anchor was to be installed two bolts were installed 6¼ in. apart in the wall. The bolts above and below the windows were in line with each other and were arranged at heights of 16 ft. 4 in. and 29 ft. 2 in. respectively above the ground at each place where a guy was needed. The bolts protruded from the wall a distance of 2 in. and provision was made for the installation of anchors at thirteen places along the wall.

As the windows of the building opened outward in a semi-circle, it was necessary to use a special attachment so as to provide clearance for the windows when opened. The construction as shown in the accompanying illustrations was carried out. Iron plates 5/8 in. x 9 in. x 12 in. were provided for installation as anchors. These were cut and drilled to fit the bolts in the building and then were bent to angles necessary for the construction. Extra high strength 5/16-in. galvanized steel wire was used for the attachment. The anchoring construction was made up on the ground and then was installed on the building. Guys of galvanized steel were installed between the fixtures to secure them in their proper position. After installing the anchor construction, the new trolley special work was built and the old guys and other construction were removed as the job progressed. The amount of special work attachment was reduced to a minimum in order to make it as simple as possible.

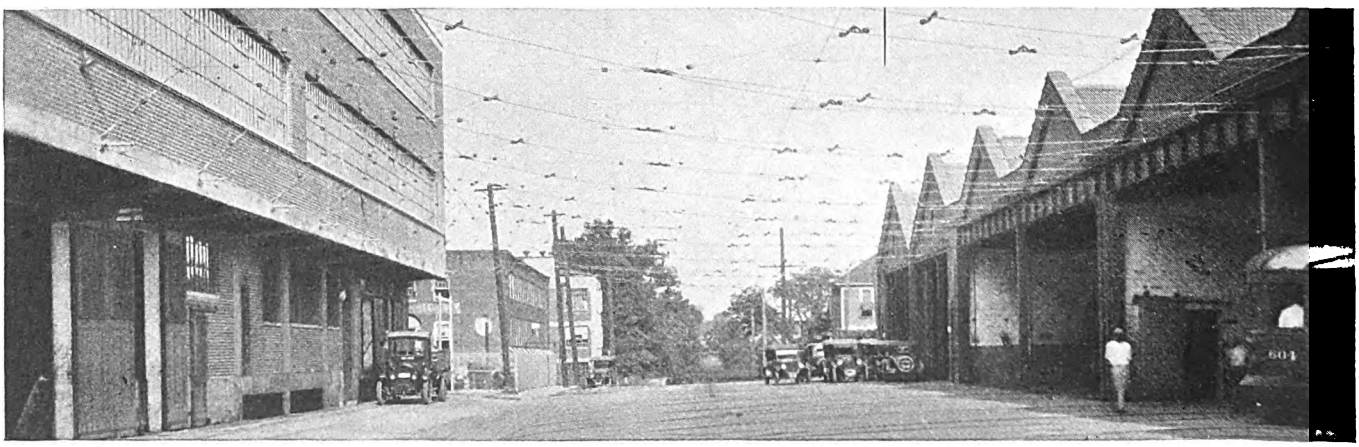
The new storeroom has a track running parallel to the side of the building for unloading material. One rail



Type of construction used along new building provides for anchoring overhead special work

of this track extends under the edge of the building. To support the trolley wire other special construction was necessary, as may be seen from the accompanying illustration. The construction used consists of a piece of iron 9 in. x 5 in. x 3/8 in., to which was welded one end of a 2-in. pipe coupling. A piece of 2-in. galvanized iron pipe 16 in. long with a galvanized iron cap at the extreme end was screwed into this coupling. Ohio Brass Company's type N swivel pole bracket hangers were clamped on the pipe over the center of the track.

To insulate this device from the wall a piece of fiber was placed behind each plate with fiber washers and fiber tubes over the bolts. A round 5/8-in. iron washer was placed between the fiber washer and the nut of the bolt. This made a very rigid and substantial fixture. When the erection of these devices was completed the trolley special work was carried out and was strung with No. 00 phono-electric hard-drawn copper trolley wire.



Space between carhouse and new building where new type of construction was used

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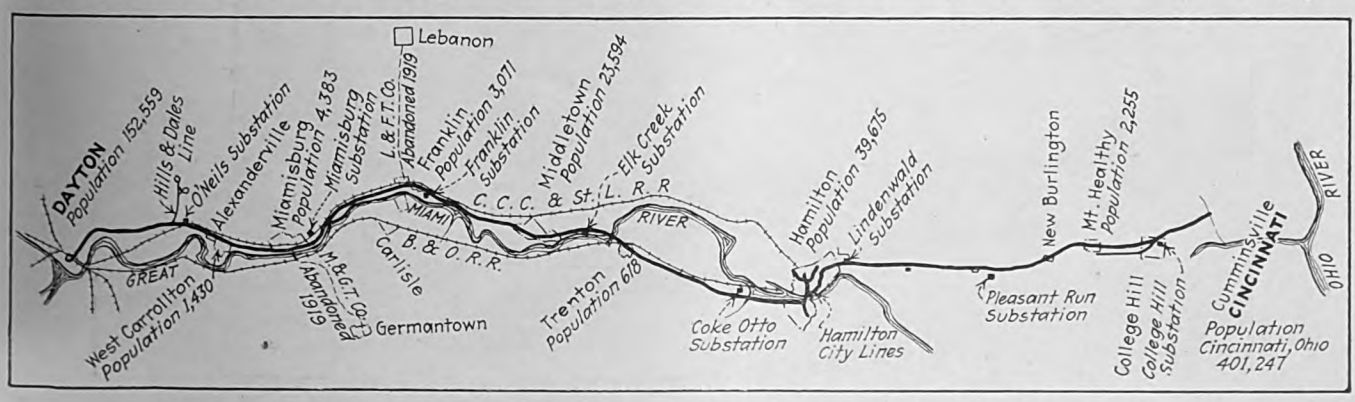
New storage yard, shop and general offices of the Cincinnati, Hamilton & Dayton Railway. The building is of concrete, brick and steel construction, 422 ft. long by 111 ft. wide

A New Era Dawns for the C., H. & D.

High finance and receivership give way to rehabilitation and progress on the Cincinnati, Hamilton & Dayton Railway. This 53½-mile interurban has expended nearly $1,500,000 on new cars, shops, substations and track improvements

NEWS stories in ELECTRIC RAILWAY JOURNAL of June 25 and July 2, 1927, carried reports of the celebration staged to commemorate the completion of the first stage in the rehabilitation of the Cincinnati, Hamilton & Dayton Railway. This rehabilitation was both physical and financial. It has brought about a complete reversal of the outlook for the property. In the short period of barely more than a year, mere public tolerance has given way to enthusiasm and good will; the employees have caught the spirit of the management, and a property which was headed for the scrap heap holds promise of becoming an invaluable asset to the territory it serves and a source of attractive profit to its investors.

Under the leadership of Dr. Thomas Conway, Jr., J. H. McClure and their associates, the new management of the C., H. & D., which acquired this property on April 27, 1926, through foreclosure, is confident that the disappointing financial results of the operation of the property in the past are in large part—as in the case of many other interurban properties throughout the country — attributable to failure to keep pace with the times. The object of this management's policy is the upbuilding of a revitalized and thoroughly rehabilitated property; first-class track, an economical, modern and reliable power supply, adequate and properly equipped shop facilities, and, above all, cars which will offer a fast, comfortable and attractive ride to passengers. In the short period since April, 1926, there has already been



The 53½-mile interurban line comprising the Cincinnati, Hamilton & Dayton Railway runs through the Miami Valley from Dayton to the outskirts of Cincinnati

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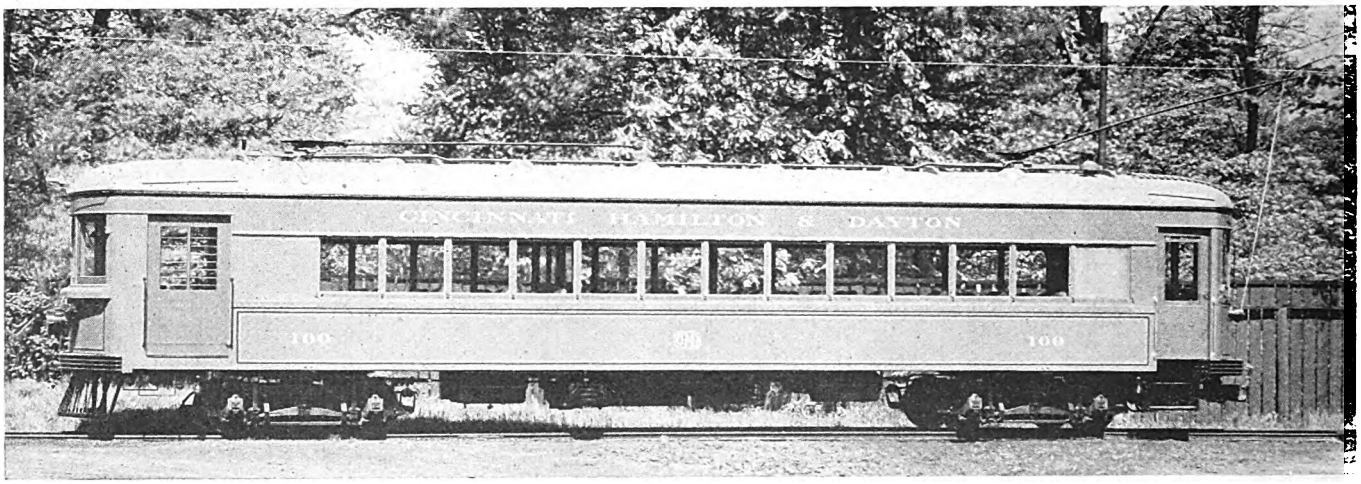


One of the seven new single-end combination baggage and passenger interurban cars built by the Kuhlman Car Company, which replace old equipment on the C., H. & D.

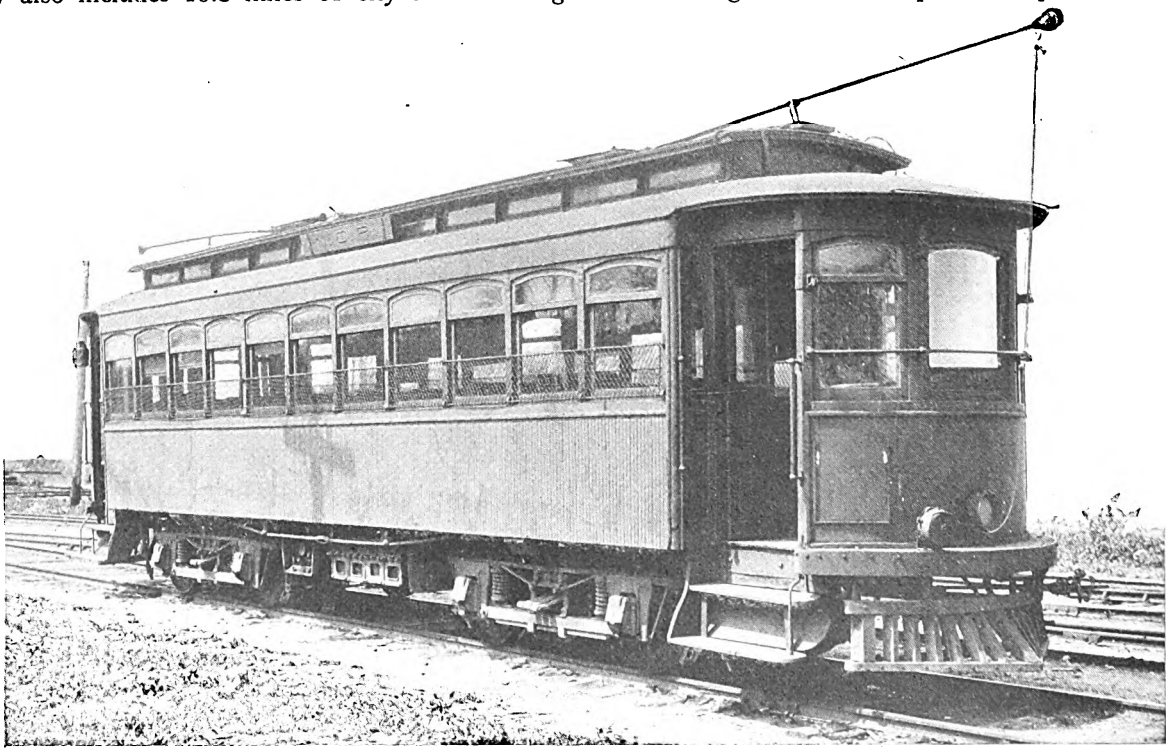
substantial evidence that the road is on the way to becoming a credit and a source of pride to the communities it serves, and a means of recovering some of the losses of its investors. By accepting a radical scaling down of fixed charges through exchanging former bonds for junior securities, thus permitting new money for improvements to be raised and put into the property, old investors have opened the way for the road to be built back and expanded out of earnings so that it promises not only to show attractive returns on new money but to compensate for former losses.

The Cincinnati, Hamilton & Dayton property comprises 53½ miles of interurban line running through the rich Miami Valley from the heart of Dayton, Ohio, south through Miamisburg, Franklin, Middletown, Trenton, Hamilton, Mount Healthy and College Hill to Cumminsville in the outskirts of Cincinnati. Including double track, there is a total of 72.95 miles of interurban trackage. At the Cincinnati end of the line a 5-mile bus extension is operated to the heart of the city. The property also includes 13.8 miles of city track serving the city of Hamilton, Ohio, a community of approximately 50,000 population.

Rehabilitation Program Extensive

Almost a million and a half dollars has already been expended on the rehabilitation of the property. Additional improvements aggregating $180,000 are authorized for this summer. Ten new high-speed de luxe interurban cars were purchased to replace the present equipment used in through service between Cincinnati and Dayton. Ten new double-truck de luxe one-man, two-man cars were purchased to replace old equipment in use at the Dayton end of the line. Six new single-truck one-man cars were purchased for service in the city of Hamilton, and sixteen of the 22 existing Birney safety cars were completely rehabilitated for that service. Equipment purchased included also 40 C.E.R.A. standard freight box cars and a new 50-ton freight motor car to be used as a locomotive.

The company's old power house will be shut down, contracts having been made for purchased power at an attrac-



These cars, formerly used in Dayton city service, formed the funeral pyre which marked the coming of a new era in the C., H. & D.

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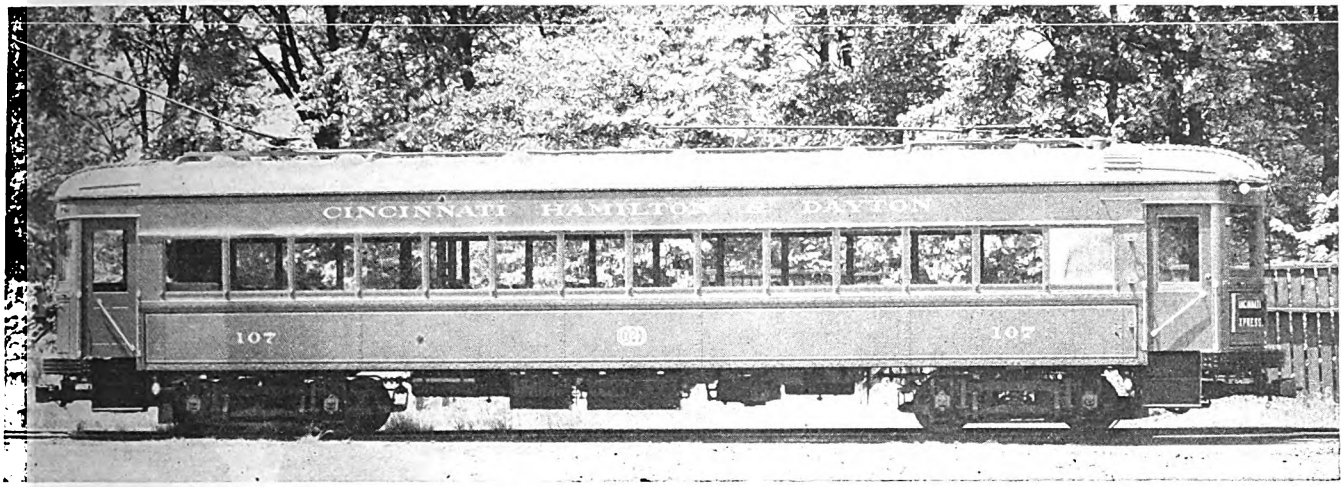

One of three double-end interurban passenger cars arranged for train operation

tive rate, and eight new full automatic substations were substituted for six old manually operated 25-cycle stations formerly in use. Nearly a mile of new high-tension line was constructed; direct-current feeders were overhauled and necessary switching facilities installed to insure adequate protection in the event of line failure or other emergency. In addition, trolley wire replacements were made where needed and the line department provided with utility equipment required to insure adequate inspection, maintenance and freedom from interruptions to service and to cut line maintenance costs to the minimum.

A large modern concrete and steel shop building, together with necessary machinery and labor-saving hoists and cranes, was purchased. Land was obtained with this plant to provide a storage yard for approximately 75 cars, conveniently arranged for movement in and out of the shop and to the main-line tracks. The former inadequate and inconvenient shop was shut down and sold.

Track Improved and Freight Facilities Added

During the receivership extensive tie replacements had been made, so that this part of the roadbed was in fair shape. There has followed a determined program of weed extermination, track alignment and reballasting. Paved track on Pleasant Avenue in Hamilton has been completely rebuilt at a cost of more than $105,000. New wyes have been installed, bonds replaced where necessary, new electric switches put in to cut down delay while operating through city streets, and the telephone system has been rehabilitated. Service equipment and machinery needed by the track department have been purchased.

In addition to the new freight equipment, terminal facilities have been provided to enable this class of business to be handled efficiently. A new double-track connection with loading facilities within the building was constructed into the enormous new Delco-Frigidaire plant of the General Motors Company at Moraine, Ohio, at a cost of more than $37,000. A new fabricated steel freight house, together with necessary trackage, was built in Cumminsville, the Cincinnati terminal, and further additions at this point are contemplated.

All of the above work has been practically completed. Additional track improvements to be made this summer include reconstruction work in Dayton, south of Miamisburg, between College Hill and Mount Healthy and in Hamilton. These involve an expenditure of some $137,000. Construction of new sidings, extensions to freight stations and trackage, rehabilitation of passenger waiting rooms and the installation of block signals will bring this sum to more than $180,000.

Balance Sheet, Dec. 31, 1926, Cincinnati, Hamilton & Dayton Railway

ASSETS		
Investments		
Road and equipment	$4,675,890.00	
Miscellaneous physical property	18,710.00	
Additions and betterments	397,594.05	
		$5,092,194.05
Current Assets		
Cash	$20,090.49	
Miscellaneous accounts receivable	13,030.69	
Material and supplies	75,607.36	
		108,728.54
Prepaid Expense and Deferred Items		
Prepaid insurance	$3,047.55	
Prepaid taxes	1,773.22	
Other prepaid expense	1,774.11	
Unadjusted accounts	1,159.62	
		7,754.50
		$5,208,677.09

LIABILITIES		
Capital Stock		
Common, no par value, 60,000 shares issued		$3,926,138.01
Funded Debt		
Dayton Traction Company first mortgage 6 per cent bonds issued and outstanding	$250,000.00	
Hamilton city lines first mortgage 6 per cent bonds issued and outstanding	200,000.00	
Cincinnati, Hamilton & Dayton Railway Company first mortgage Series "A" bonds	350,000.00	
Car trust certificates, cars 60 to 75	6,379.00	
		806,379.00
Contract liabilities	$50,400.00	
Paving assessment installments	11,089.37	
		61,489.37
Current Liabilities		
Loans and notes payable	$56,113.80	
Audited accounts and wages payable	56,066.60	
Miscellaneous accounts payable	12,690.48	
Accrued interest	317.72	
Accrued taxes, local and federal	21,203.06	
Other current liabilities	1,414.91	
		147,806.57
Reserves		
Depreciation	$203,097.10	
Receiver's contingency	5,819.43	
Operating	12,389.46	
Other reserves	1,629.31	
		222,935.30
Surplus		43,928.84
		$5,208,677.09

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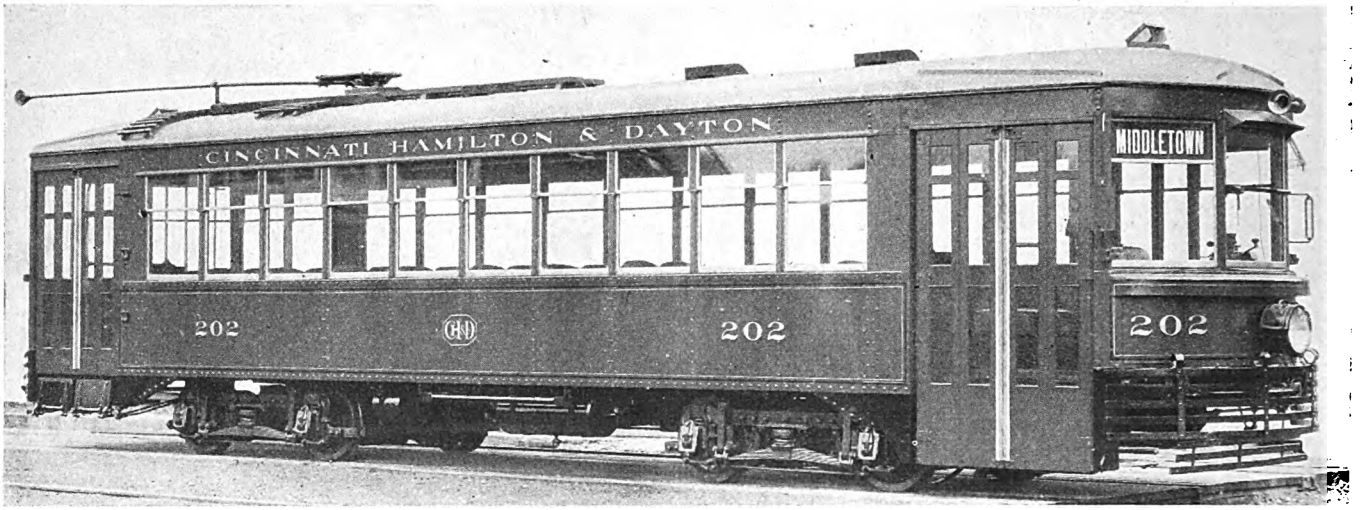


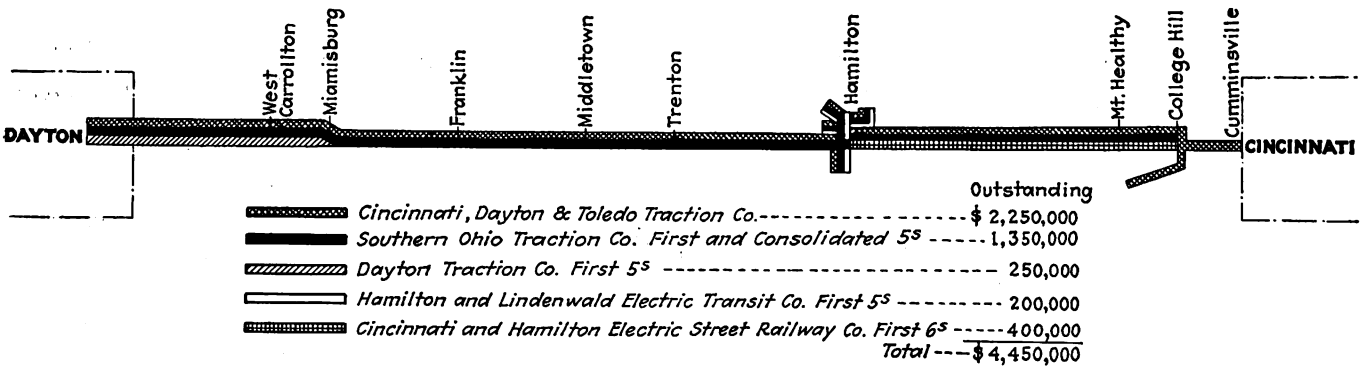
Ten of these de luxe city cars built by the Cincinnati Car Company replace the former dilapidated equipment which is illustrated elsewhere

Like many other interurbans of this type, the present property was built piecemeal. In 1894 the first section was constructed from Dayton to Miamisburg and was called the Dayton Traction Company. The section from Miamisburg to Hamilton, built in 1896, was known as the Cincinnati & Miami Valley Traction Company. Two years later, in 1898, the Cincinnati & Hamilton Electric Street Railway built that part of the line which connects Hamilton to College Hill in the outskirts of Cincinnati. In 1900 all three of these properties were consolidated into the Southern Ohio Traction Company, which also absorbed the Hamilton & Lindenwald Electric Transit Company, comprising the local street railway lines serving the city of Hamilton. In 1902 the Cincinnati & Northwestern Railroad, approximately 6 miles of steam railroad running from Cumminsville north to Mount Healthy, was consolidated with the Southern Ohio Traction Company to form the Cincinnati, Dayton & Toledo Traction Company. Then in 1905 the entire property was leased to the Cincinnati Northern Traction Company. This company operated the property for two years, built the Lindenwald power plant, high-tension line, substations and 27 miles of new track on private right-of-way to replace other track originally constructed on the highway. The new power system replaced the separate d.c. power plants that had been formerly operated and that had been built by the various original operating companies. In 1907 the Cincinnati Northern Traction Company assigned its lease to the Ohio Electric Railway, and the property was operated by that company until 1918. In 1916, default of interest on bonds of the Cincinnati, Dayton & Toledo Traction Company led to the appointment of a receiver, but the Ohio Electric Railway was permitted to continue operation until two years later.

The property was reorganized in 1918, following a foreclosure sale which wiped out $2,250,000 of Cincinnati, Dayton & Toledo Traction Company bonds, and became the Cincinnati & Dayton Traction Company. This company then issued bonds on segregated portions of the property. A question of priority in interest payments on these latter securities, raised by the holders of the general underlying bonds, and default having occurred in the payment of principal and interest upon certain underlying bonds, litigation was begun which resulted in a receiver being appointed in 1920. Both the litigation and the receivership continued until 1926. At their termination the property was sold to the reorganization managers representing the Southern Ohio Traction and the Cincinnati & Hamilton Electric Street Railway bonds, which organized the present Cincinnati, Hamilton & Dayton Railway.

Financial Structure Simplified

Two small underlying mortgages are retained. The Dayton Traction Company first 5's, shown on the accompanying chart, were extended as 6's to 1931. The Hamilton & Lindenwald first 5's on the Hamilton city lines were refinanced as 6's to 1931. The total of these two issues amounts to $450,000. The new company created an open-end mortgage over the entire property and issued $850,000 in bonds, which were purchased for cash by the holders of the old Southern Ohio Traction Company bonds, the Cincinnati & Hamilton Electric Street Railway bonds, and a syndicate organized by the new management. There were then issued 60,000 shares



Mortgage map of the Cincinnati, Dayton & Toledo Traction Company shows the financial structure that formerly burdened the property. There is now outstanding a total of only $1,300,000 of bonded indebtedness

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of no par value common stock to represent the balance of the equity in the property, the minimum value of which was fixed by an engineering appraisal at $4,675,890. All of the common stock is held by a holding company known as the Cincinnati, Hamilton & Dayton Corporation. This financial structure is expected to permit earnings to be plowed back into improved and extended facilities, so that the road may keep pace with the needs of its territory and may continue the program of modernization so auspiciously started. Part of the cost of new equipment was financed by an issue of $450,000 of car trust certificates.

Planning Has Been Done for the Future as Well as the Present

It has been the general object of the new management to develop and execute an over-all plan for the rehabilitation of the property that should bring the maximum results for the territory served and for the investors, utilizing existing financial resources so as to bring about the greatest possible immediate improvement, but at the same time fitting each step into an over-all program. This was particularly important in the selection of the interurban passenger cars, in providing new shop and yard facilities, in expenditures for the development of freight business and in planning improvements to power facilities and right-of-way.

There are roughly 600,000 people at the Cincinnati end of the line, and a large amount of freight moves between Cincinnati, Dayton and points north thereof. In addition, the entire Miami Valley is a heavily settled district with many important industries scattered throughout its length. Further improvements in the line, relocations to give a better right-of-way so as to make fast transportation of freight and passengers possible, development of passenger business at the Cincinnati end of the line and of through passenger travel from Dayton to Cincinnati following completion of the subway under construction by the city of Cincinnati, all constitute future possibilities that are taken into consideration in the present program. The Miami Valley is believed by the management to be destined to become a very much more heavily settled industrial district. The new Delco-Frigidaire plant alone has led to the development of a 2,000-acre tract for residential puposes in its immediate vicinity. At Middletown the American Rolling Mills Company has recently acquired the Coke Otto by-products plant as part of a program to extend its operations in the valley. There is believed to be a strong prospect that the entire valley will develop into a continuous string of industrial and residential communities.

The general features of the rehabilitation program and the design of new equipment will be published in subsequent articles.

Chicago "L" Employees Have Long Service Records

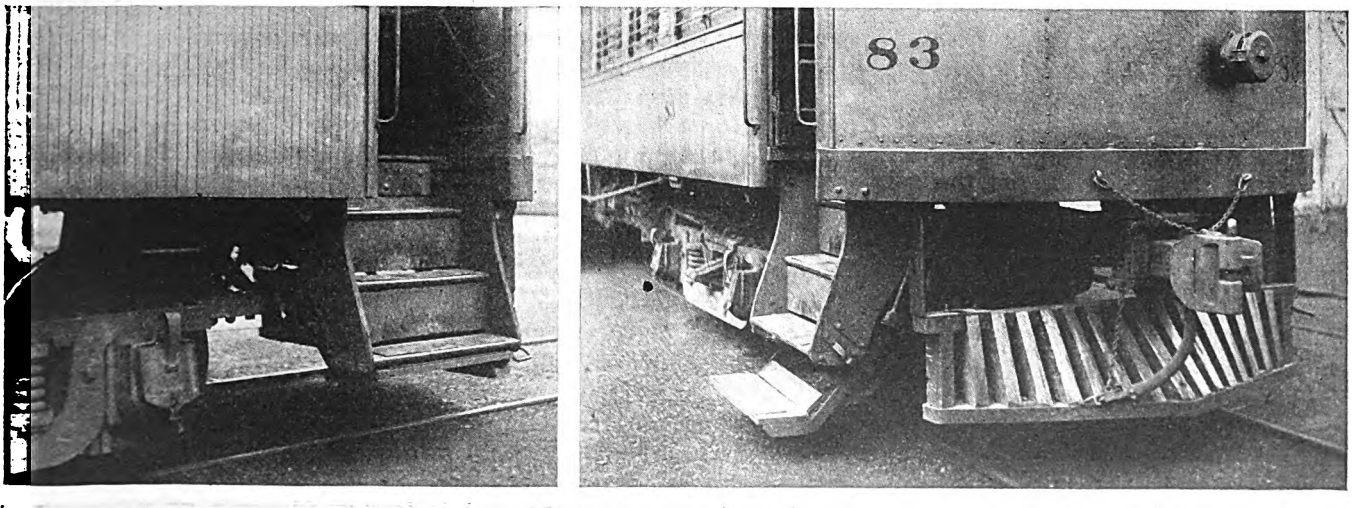
CHICAGO RAPID TRANSIT employees cannot have extremely long service records, as the first line, the South Side Elevated, was only partially opened for traffic in 1892. Still there are 114 employees with from 30 to 35 years service, including many who started with the company in its first few months.

The Lake Street Metropolitan and North Side divisions opened in the years between 1893 and 1900. The survey showed 221 employees with between 25 and 30 years of service to their credit and 363 employees who have been with the company and its predecessor companies between 20 and 25 years. A significant point shown by the survey is that only 915 employees have been with the company less than one year, while 1,571 are in the one to five years class and 1,543 in the five to ten years class. In the ten to fifteen years class there are 684 employees and in the class from fifteen to twenty years there are 616 employees.

Folding Extension Steps for Interurban Cars

SOME time ago the Southern Ohio Public Service Company, Zanesville, Ohio, decided to discontinue the use of old style Pullman stools for unloading and loading passengers and to provide an extension step to the permanent step construction of its cars. The accompanying illustration shows the step construction, which has proved entirely satisfactory, and since its installation there have been no accidents to passengers when boarding and alighting from trains.

The step consists of a tread and toeboard mounted on strap-iron hangers. These hangers extend upward at an angle to an operating shaft which is attached to the step skirting. The shaft is rotated by means of a handle installed alongside the permanent step construction. The step is lowered by raising this handle and when pulled down the step pulls into its running position.



At left, step in folded position; at right, step in position for passengers

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The Prize Winner for June Is

CHARLIE HERMS

Commutator bar spacing attachment for slotting machine gets $25 monthly prize for June in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest. Robert Harris receives honorable mention for method of setting car window glass in rubber tubing

Charlie Herms

THE winner of the June prize, Charlie Herms, went to the San Diego Electric Railway in 1923 as shop foreman and early the following year was promoted to general shop and carhouse foreman, his present position. He began his electric railway experience in 1919 with the San Antonio Public Service Company in Texas as general repair man. He continued in this capacity for four years, when he was promoted to foreman over a crew engaged in remodeling cars.

Mr. Herms has always been particularly interested in mechanical construction and during the war was attached to the first army headquarters in a motor repair unit. Other experience outside of the electric railway field included supervision of the mill department of the San Antonio Portland Cement Company and a position with the Boston & Superior mine in Arizona to recondition the electric and telephone system of that company.

"COMMUTATOR Bar Spacing Attachment for Slotting Machines," an article submitted in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest by Charlie Herms, general foreman of the San Diego Electric Railway, San Diego, Cal., was given the $25 monthly award by the judges. It was further agreed that honorable mention should go to Robert Harris, master mechanic of the New Brunswick Power Company, St. John, N. B., for his description of the method used by that railway in setting car glass in rubber tubing.

Competition for the June prize was close. Twelve articles were published in the Maintenance Data Sheet section of ELECTRIC RAILWAY JOURNAL for June 18. All these were considered as very high class by the judges. The spacing attachment for a commutator slotting machine showed special thought on the part of the developer to devise a successful machine which would accomplish the work in a partially automatic manner, thus relieving the operator from the care and thought that must be given to manual spacing of commutator bars. The device is ingenious and will prove of great benefit in the slotting of commutators which is now universal practice on all electric railways. By use of such an attachment the slots will be lined up accurately so that a wider saw can be used without danger of cutting away the copper bars and so that less mica which requires removal before the armature is to be placed in service will be left along the edges of the slots. The time for slotting with such an attachment should be reduced materially.

Breakage of glass is one of the annoying occurrences on electric railway cars. Glass set in rubber tubing as described in the article by Robert Harris should prevent the tendency to loosen and rattle, eliminate some noise and decrease materially the breakage. On a number of properties the replacement glass costs a considerable sum in a year. A large saving should result from the use of rubber tubing.

The Maintenance Data Sheet section in this issue includes another group of articles submitted in ELECTRIC RAILWAY JOURNAL'S competition. The amount of material which has been received is now far above what can be published in one issue so that many interesting descriptions of methods and devices are being held for publication in future issues. The articles published this week will be judged for the monthly prize of $25 for July. These should serve as a guide to contributors as the kind of material that is being submitted. Full information regarding the rules of the contest was given in the April 16, 1927, issue of ELECTRIC RAILWAY JOURNAL, pages 700-701, and condensed rules and instructions for the contest have been published each week since then. Contestants should read the rules carefully in order that they may comply with all conditions.

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Electric Railway Journal Maintenance Data Sheet

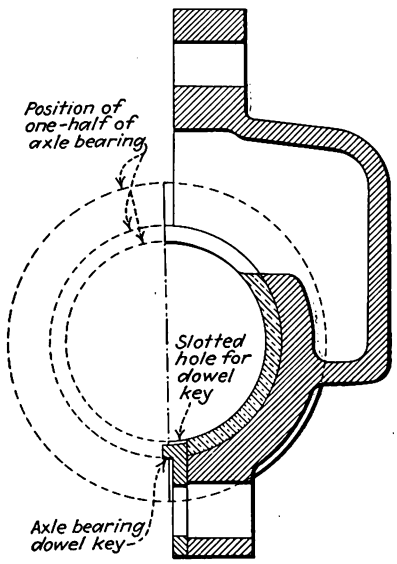
ROLLING STOCK—ELECTRICAL—17

Axle Bearing Dowel Prevents End Motion*

By J. A. Duffy
Superintendent of Equipment Monongahela West Penn Public Service Company, Fairmont, W. Va.

THE ordinary dowel pin used with axle bearings allows them to slap against the end of the motor axle housing if the axle collar is loose. This results in unnecessary wear of the inside of the axle collar and causes short life to the axle bearings.

To overcome this condition a special type of axle bearing dowel is used with equipment on our property. The accompanying illustration shows the assembly with an axle bearing. The dowel is fastened to the axle cap and projects through a slot into the bearing so that it not only holds the axle bearing in place but it keeps it from turning around and also from working inward.



Special dowel key for axle bearing

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—5

Keeping Paving in Good Condition with Little Money*

By Louis T. Botto
Superintendent Maintenance of Way San Antonio Public Service Company, San Antonio, Tex.

MORE than 300,000 sq.yd. of pavement in the track area must be kept in good condition by the maintenance of way department of the San Antonio Public Service Company. Although paved track mileage has been added each year and the old pavement has become harder to keep in repair, still the amount spent for paving maintenance has been less each year since 1924. This saving has been brought about by extensive use of Uvalde rock asphalt, Mexican oil of 12 gravity and limestone screenings.

Wood block paving and long stretches of brick and concrete pavement have been reclaimed simply by the application of the Mexican oil, dusted off with a thin covering of finely ground rock asphalt, sufficient to fill the depressions in the street. In regular paving maintenance work slight depressions in the track area are cleaned, oiled and dusted off. Deeper depressions along the rails, or holes in the track area, are cleaned thoroughly, oiled, filled with limestone screenings, oiled again, and then the surface is covered with the asphalt, leaving the surface slightly higher than the street grade to allow for settling.

West Commerce Street, San Antonio, Tex., as it appeared in June, 1927. Pavement was treated with Mexican oil and rock asphalt in 1914

Rock asphalt has proved of particular benefit as a paving material when laid properly. It is ground finely and can be applied successfully to any hard, unyielding paving surface, such as wood blocks, brick, concrete or asphalt. It can be used in any thickness desired, even as small as ¼ in.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—13

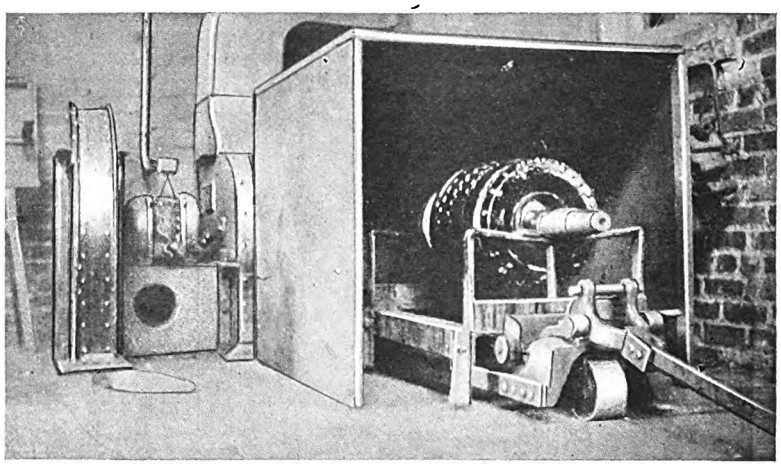
Exhaust Tunnel for Carrying Off Dust from Armatures and Motors*

By C. W. Wood

Master Mechanic Virginia Public Service Company, Hampton, Va.

DUST is being cleared from armatures and motors in the shop of the Virginia Public Service Company by the exhaust tunnel shown in the accompanying illustration. This is a portable box made on a frame of ⅞-in. x 2-in. wood strips covered with beaver board. The sides and rear end are fitted with dowel pins. The top has holes corresponding to the dowel pins in the sides and end.

The rear end has a square hole 12 in. x 12 in. about the middle which fits over the neck of the intake side of an exhaust fan of the Buffalo Forge exhaust blower type. Armatures are blown out with an air hose connected to the shop air supply and all dust is carried up the shop flue by the exhaust.



Portable box with forced exhaust for carrying off dust

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—6

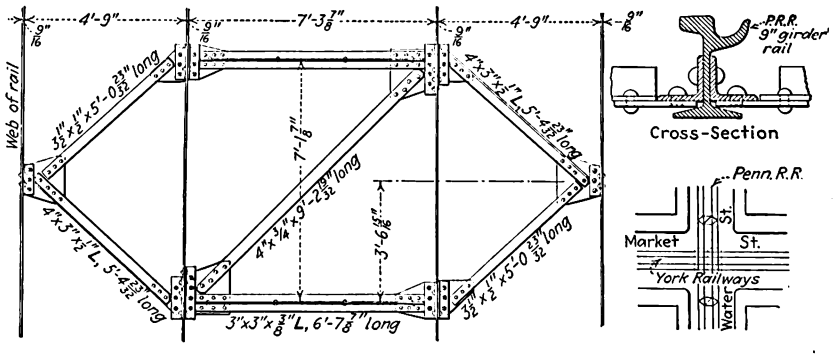
Anti-Creeping Anchors for Double-Track Crossings*

By L. C. Mayer

Chief Engineer York Railways, York, Pa.

ELECTRIC railway crossings at double-track steam railroads are affected materially by the creeping of the railroad tracks in the direction of traffic. As a result, after a few months, a track crossing assumes an appearance of a letter "S." It then has to be opened up, new rails cut into the railroad tracks on both sides of the electric railway crossing, parts realigned and pavement replaced. If this is not done at frequent intervals the arms of the crossing in the electric railway tracks are liable to be broken by the stress.

To overcome such troubles the York Railways constructed a horizontal truss, which, when attached to the webs of the railroad rails, anchor one track to the other. The truss is constructed of structural shapes, the tension members resisting the creepage of the railroad tracks and the compression members preventing the railroad tracks from converging under stress. The accompanying illustration shows the construction. One of these trusses was placed in the tracks of the Pennsylvania Railroad between Harrisburg and Baltimore, where railroad traffic is quite heavy. After three years' service the electric railway crossing shows no signs of being pushed out of alignment.



Anti-creeping anchors for crossings of electric railways with steam roads

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—1

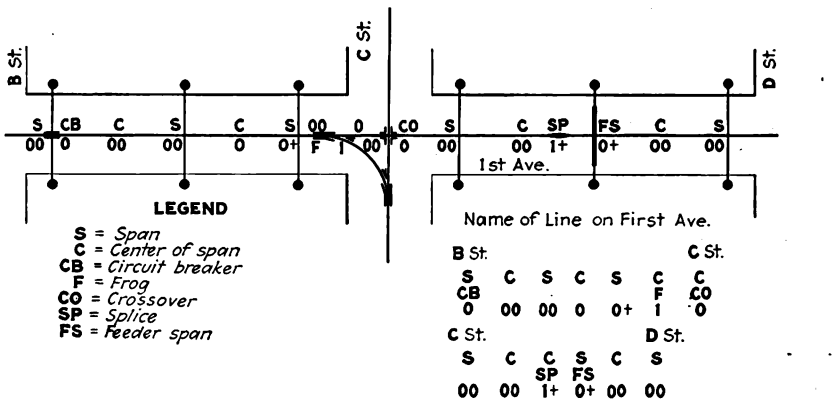
Convenient Method for Gaging Trolley Wire*

By M. M. Watkins
General Foreman Railroad Distribution
New Orleans Public Service, Inc., New Orleans, La.

Gaging and inspection of trolley wire is done by an effective method developed by the New Orleans Public Service, Inc. The entire system, comprising 220 miles of trolley, is gaged once each six months by two men who use a light tower truck. It takes about three weeks to cover this mileage, at an average cost of $1.48 per mile.

For convenience in locating points to be gaged a key diagram is used, as shown in the accompanying illustration. The wire is measured with an ordinary B. & S. gage at the points indicated. The size of the wire is noted in an ordinary record book. In addition to making the notation of the size all fittings, such as splicers, frogs, section insulators and cross-overs, are inspected and a record is made if they are in bad condition.

An examination of the gage book is made daily and all bad wire and fittings are listed. Orders are then given to the line crews to renew or change these as rapidly as possible. This method has proved very effective and economical and has kept trolley wire breaks due to worn wire and fittings at a minimum on lines of this property.



Location of gage readings taken on trolley wire and method of recording

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—11

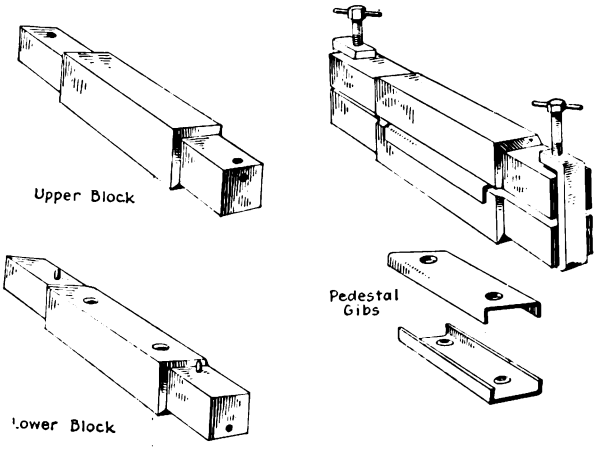
Form for Shaping Pedestal Gibs*

By A. C. Lasher
Macon Railway & Light Company, Macon, Ga.

Pedestal gibs for certain types of trucks are made easily with the assistance of a form as shown in the accompanying sketch. The device used in the shop of the Macon Railway & Light Company consists of two cast-iron blocks, each about 22 in. long by 4 in. thick, the width of which is equal to the distance between the flanges of the gibs to be made. The lower block is drilled and countersunk on its face, the holes being spaced to correspond to the spacing of the holes in the truck pedestal for which the gibs are desired.

Material for the gibs is sheared from $\frac{3}{16}$-in. or $\frac{1}{8}$-in. boiler plate. The holes are drilled or punched to proper dimensions. When drilled the holes should be slightly smaller than the desired size as they are enlarged somewhat in the process of forming.

Next the plate is heated, after which it is laid on the block and the countersunk-head pins or punches are driven into the holes in the plate and into the block. The upper block is then clamped down, with the pins still in place to act as dowels to hold the plate in alignment. The flanges are then hammered down roughly, after which the form is turned first on one side and then on the other and the flanging process is completed with a flatter and maul.



Form used for pedestal gibs in the shop of the Macon Railway & Light Company

A small dowel pin at each end in the face of one block, engaging corresponding holes in the other block, serves to hold these parts in position while the clamps are being adjusted. For lifting the upper block on and off a $\frac{5}{16}$-in. hole is drilled 1 in. deep in each end of the block. Two handles of $\frac{1}{2}$-in. iron rod about 6 in. long and covered with asbestos are used as lifters.

The form may be made to accommodate two different widths of gibs or hole arrangements. The form then can be turned over to reverse the position of the two blocks when making the second type.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—2

Trolley Reel for Emergency Trucks*

BY ANGUS G. SCOTT
Assistant Superintendent of Overhead Lines Cleveland Railway, Cleveland, Ohio

STRINGING of trolley wire in a few sections is facilitated by a small reel capable of holding 1,400 ft. As used by the Cleveland Railway, this is mounted on the rear of one of the line trucks and serves as an excellent means for carrying trolley wire.

As shown in the accompanying illustration, the reel has a diameter of 24 in. and a width of 16 in. Each side has a steel band 1 in. wide with sprockets attached. The reel is mounted on an insulated steel arbor, so as to give clearance for loading, and an adjustable brake is installed so as to bear against the steel band.

In stringing trolley wire the lower table is reversed and the trolley wire is carried up, the splicer is attached and the truck is then backed up to the point where stringing is to begin. The brake is adjusted so as to give the necessary tension to keep the trolley wire up to a safe height while stringing. In an emergency all of these operations may be performed easily by one man.

Trolley wire reel mounted on an emergency truck as used by the Cleveland Railway

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

Electric Railway Journal Maintenance Data Sheet

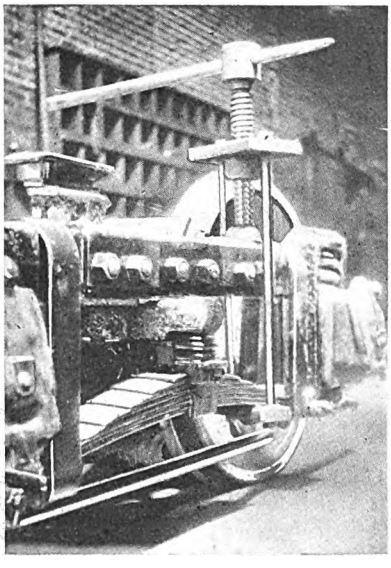
ROLLING STOCK—TRUCKS—12

Device for Installing Semi-Elliptic Bolster Springs*

BY E. C. KELLY
Shop Foreman Virginia Public Service Company, Hampton, Va.

CONSIDERABLE difficulty was experienced in replacing semi-elliptic bolster springs in some types of trucks operated by the Virginia Public Service Company until the device shown in the accompanying illustration was designed. It consists of a screw jack 2 in. x 14 in., with the usual type of swivel end to prevent creeping and reduce wear on the end of the screw. The head has two ⅞-in. holes in which to insert the handle. The cross head consists of a nut to which is welded a 1-in. x 6-in. x 10-in. bar with suitable holes drilled, to which bolts or chains may be attached, to go underneath the bolster spring and lift it into the desired position.

The use of this jack has reduced the labor cost of installing springs 50 per cent and has eliminated practically all of the accident hazard incident thereto, when a makeshift attachment was used. Many other jobs that cannot be handled on shop presses can be taken care of readily with this device.



Installing a semi-elliptic spring with jack screw in the shop of the Virginia Public Service Company

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—3

Portable Dustpan Keeps Bus Yard Clean*

By C. B. Lindsey
Superintendent of Automotive Equipment
Los Angeles Railway, Los Angeles, Cal.

BEFORE the portable dustpan shown in the accompanying illustration was constructed by the engineering department of the Los Angeles Railway the sweeping up of the bus yard was a large job. The company operates more than a hundred buses and the sweepings from these littered the yard, particularly during windy weather.

The receptacle is made so that it can be pushed under the step of the lowest bus which the company operates, and a surprisingly large amount of paper and other refuse can be swept into it. This speeds up the work of cleaning the bus and also keeps the yard in clean condition.

Sweepings from buses go directly into a portable dustpan in the yard of the Los Angeles Railway

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

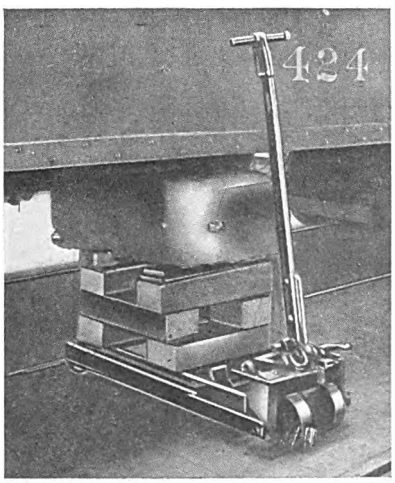
ROLLING STOCK—MISCELLANEOUS—3

Lift Trucks Used to Change Air Compressors*

By Equipment Department
Georgia Power Company, Atlanta, Ga.

STEUBING lift trucks are used by the mechanical department of the Georgia Power Company for changing air compressors. There are a total of five, one at each of three carhouses and two at the main shop. One truck at the main shop is also used for transporting motors.

Due to the lifting and sharp turning features, this type of truck is particularly applicable for changing air compressors. The accompanying illustration shows an air compressor on blocking just as it has been lowered from the car body. The blocking between the truck and the compressor is required, due to different levels at which the bottom of the compressors come. The older type compressors, which are National A-4, have a clearance of 7 in. above the rail, whereas the modern compressors on cars with 33-in. wheels have 20 in. clearance.



Compressor being lowered from car body after it has been disconnected from hangers

The truck is equipped with 7-in. wheels and has Timken roller bearings, so that it is shifted easily with heavy loads. The use of this type of truck for changing air compressors has enabled work to be done quicker and with less effort than previous methods. It has a decided advantage over the old hand method of blocking up and shifting compressors on skids.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

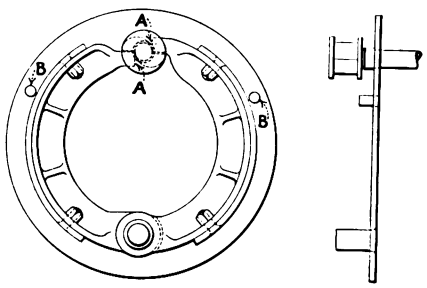
BUSES AND TRUCKS—4

Bus Brake Shoe Calibrating Gage*

By Charlie Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

ON THE buses operated by the San Diego Electric Railway it was found that in the life of a brake shoe the contact surface at the cam end wears unevenly. When a new shoe is put on the side where the contact is worn the least does all of the braking until the shoe is worn down enough to equalize with the other shoe on the same drum. This uneven condition of brakes caused considerable trouble, particularly in brakes seizing and sliding tires.

To overcome this difficulty the mechanical department of the railway devised a gage as shown in the accompanying sketch. This is similar to the actual drum mechanism, but is so made that all movable parts are in plain view of the inspector. A standard cam is used and the shoe to be tested is mounted on the pivot pin and dropped in place between the dowels, designated as *B-B* on the sketch, so as to engage the cam. To test a shoe the cam is set in release position by hand and the shoes are pushed in. The cam is then turned slowly by hand, as in setting up the brakes, until one of the shoes makes contact with a dowel, indicated as *B* on the sketch. If the opposite shoe does not touch, then the shoe contact *A* is built up by electric welding until both shoes are expanded uniformly. Since this method has been adopted most of our bad order brake troubles have been overcome and much of our tire trouble has been eliminated by having less sliding.



Brakeshoe calibrating gage used by the San Diego Electric Railway

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

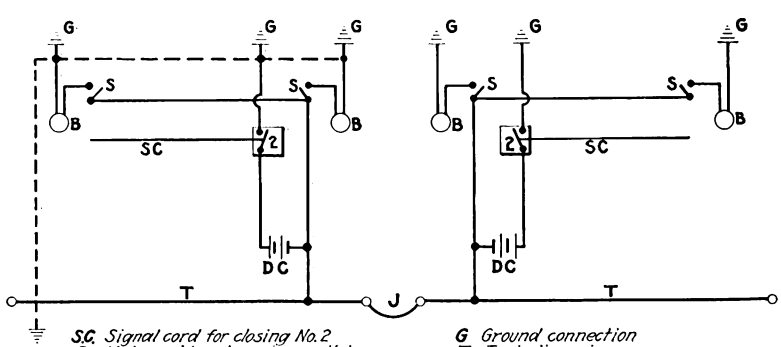
ROLLING STOCK—MISCELLANEOUS—4

Intercommunicating Signal System for Two or More Cars*

By H. A. Albin
Superintendent Lancaster, Ephrata & Lebanon Street Railway, Lebanon, Pa.

THE accompanying diagram shows an intercommunicating car signal system which is used for train operation by the Lancaster, Ephrata & Lebanon Street Railway. A buzzer or bell is installed on each end of the car and is designated by the letter *B* on the accompanying diagram. A single-pole knife switch at each end of the car closes the circuit for the particular signal bell or buzzer which it is desired to use. The positive side of a dry battery is connected to the single-pole switch and the negative side to a make-and-break switch which is operated by a bell cord. The closing of this signal switch grounds one side of the circuit and gives the signal.

All cars of the Lancaster, Ephrata & Lebanon Street Railway system are wired to use this method of signaling. The train line receptacle of the cars had one line which was not used in the control of the train and this was utilized for the "T" line through the jumper between cars. Where cars are not wired for multiple-unit control this "T" wire must be installed in each car and a jumper connection provided between the cars.



SC. Signal cord for closing No. 2
2 Make and break spring switch
DC. Dry cell batteries
S Single-pole knife switch
G Ground connection
T Train line wire
J Wire jumper between cars
B Signal bell or buzzer

Wiring diagram of intercommunicating signal system for electric cars

*Submitted in Electric Railway Journal Prize Contest.

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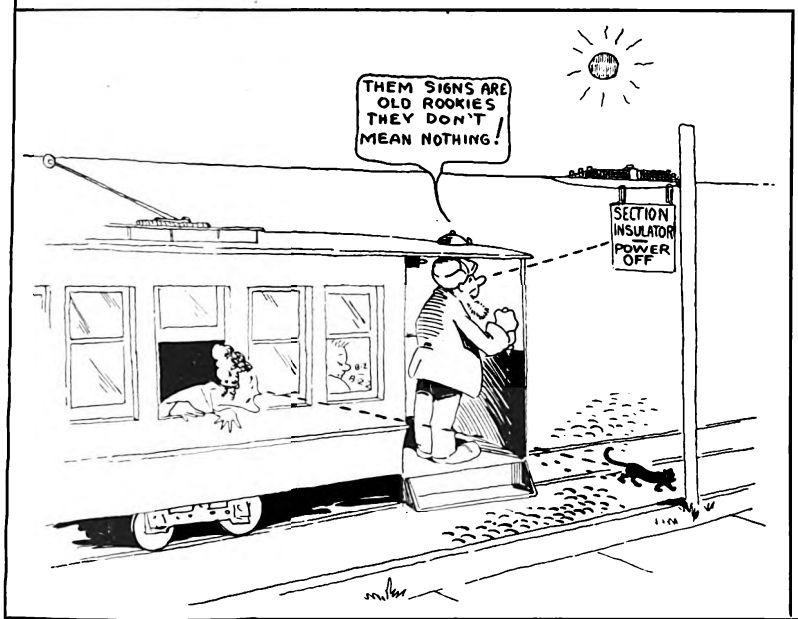
Adventures of

Old Man Trouble

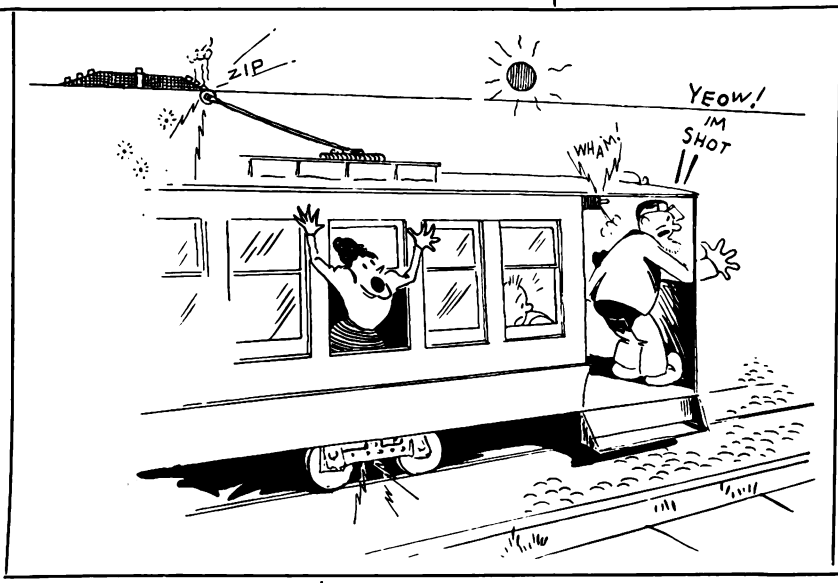
on the

Hicksville Railway



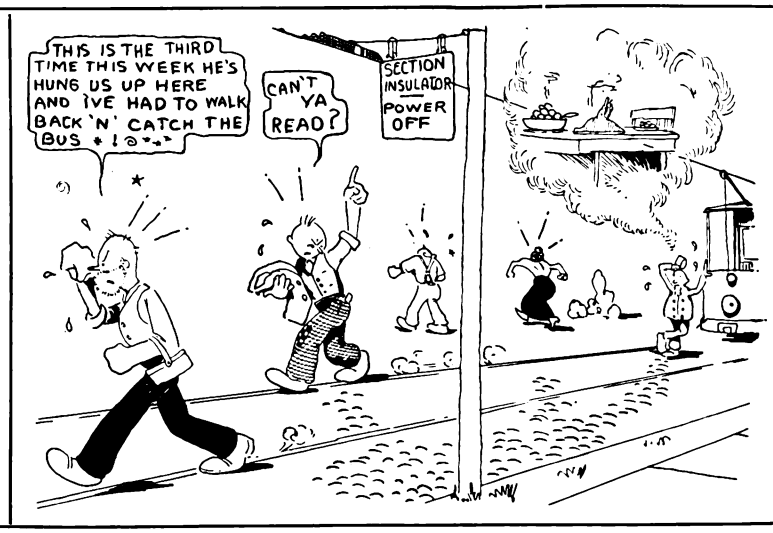
Some people are strong believers in signs

Others never read them



Shutting off power and allowing the car to coast across section insulators does not cause the car to lose speed.

Many disastrous equipment failures can be traced to recurrence of heavy momentary overloads caused by suddenly restoring the power when the controller is in the running position.



ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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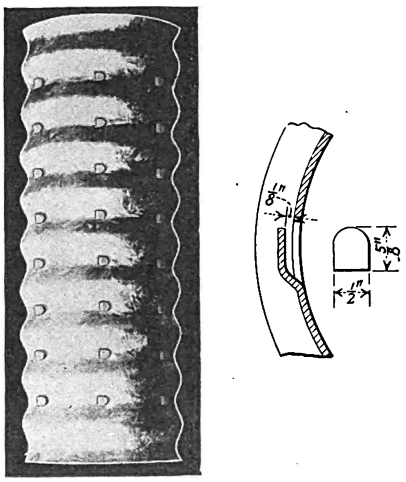
New Equipment Available

Improved Type of Perforated Drain

PERFORATED drainage structures as manufactured by the Canton Culvert & Silo Company, Canton, Ohio, have been improved so as to overcome roadbed troubles resulting from improper drainage.

The new type B drain illustrated consists of a galvanized pipe punched in the upper two-thirds of its circumference with rows of holes, each protected by an outward-pressed tongue which is raised about ⅛ in. from the body of the pipe. This construction retards the entry of silt or dirt into the pipe, and excess water is carried off quickly.



The pipe is punched in the upper two-thirds of its circumference with rows of holes protected by a Tongue

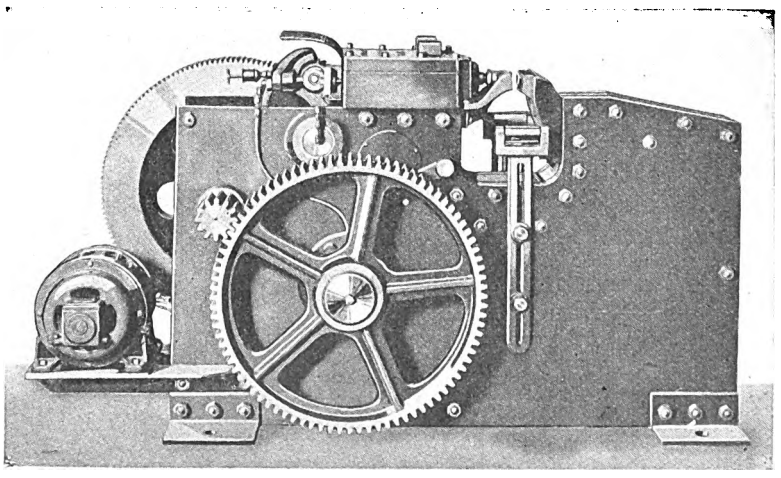
The base metal is No. 16 gage or heavier Toncan copper molybdenum iron, which is a comparatively recent metallurgical improvement in the field of rust-resisting iron. Tees, ells and curved sections to any radius can be supplied. Advantages claimed for this type of construction are extreme durability, unbreakable construction, increased strength and ease of handling and installation.

One good general overhaul will save many a dead car haul.

Horizontal Punch Handles Special Shapes

FOR convenience in punching flanged pieces, curved angles, beams, channels and other special shapes which cannot be handled to advantage in a vertical machine, the Buffalo Forge Company, Buffalo, N. Y., is adding a new horizontal punch to its line. All gears, flywheel, etc., are below the top of the machine so as not to interfere with the handling of specially shaped and bent sections. Architectural jaws allow punching close to the corners of angles, I-beams and channels and in the webs and flanges of H-sections. The semi-floating punch head permits lowering the punch for the accurate locating of centers. The punch is engaged by a foot trip.

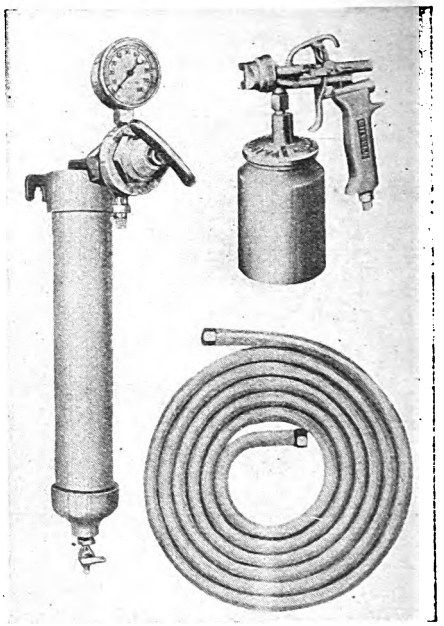
A cast-steel rocker arm on a bronze-bushed kingpin which is stationary in the frame operates the punch. The frame is reinforced at this point by welded disks. Wear of the ram is taken up by bronze-bushed eyebolts. Gibs on the plunger make it adjustable for wear. The frame is made of two heavy armor steel plates. The machine is built in four sizes, with capacities of 3, 5, 7½ and 10 hp.



New horizontal punch for use with special shapes

Siphon-Feed Paint Spray Unit

SIPHON feed adaptable to a wide range of painting is used in a spray unit placed on the market by the Alexander Milburn Company, Baltimore, Md. The outfit with type E gun can be used for either paint or lacquer finish. The gun can be adjusted for the fine work of touching up and also can be used for spraying large surfaces. An ordinary compressor is sufficient to supply the volume of air needed.



New paint spray unit

The atomization of the new spray outfit is very fine, which minimizes sanding and rubbing operations. It is surrounded by an air pocket, which lessens the loss of material, so that the entire spray can be utilized for covering surfaces thoroughly. The equipment includes an air purifier which is of scientific construction for delivering pure air only to the gun. It is of assistance in obtaining good finishing results. The air upon entering the purifier passes through a series of double baffles, which extract the moisture and other impurities.

The complete unit includes a type E gun with quart container, air conditioner, air regulator and 25 ft. of air hose with necessary connections.

Fish-Tape Puller

A SIMPLE, husky come-along for fish tape has been placed on the market by Mathias Klein & Sons, Chicago, Ill. It does not injure the tape and can be carried in the pocket.

To attach the puller to the fish tape the tape is placed sideways in the slot

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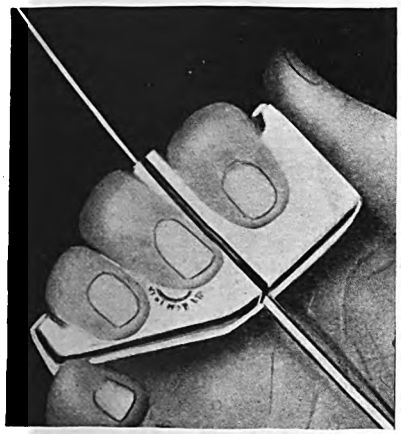


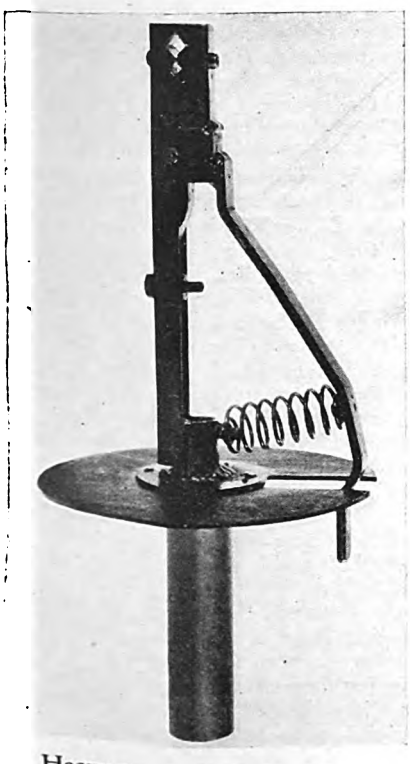
Convenient type of fish-tape puller

and a slight forward motion is given to the puller while pushing the tape deeper. This slips the tape under the ratchet wheel and by pulling a positive grip is obtained. The puller can be slid forward to any desired position for a new bite.

Heavy Current Electrode Holder

WITH the coming of heavy current arc welding, new accessories have been necessary. The accompanying illustration shows a 600-amp. metal electrode holder just brought out by the Lincoln Electric Company, Cleveland, Ohio. This holder handles metal electrode in sizes up to ½ in. diameter and is known as type TR.

Many improvements are claimed for the holder, among them being replaceable copper jaws, four line contact for the electrode, all copper path for welding current, structural steel construction, light weight with good balance, cool insulated and ventilated handle and shield for protection of the operator's hand. High-current, high-speed manual welding requires holders and accessory equipment with the maximum comfort.



Heavy current electrode holder

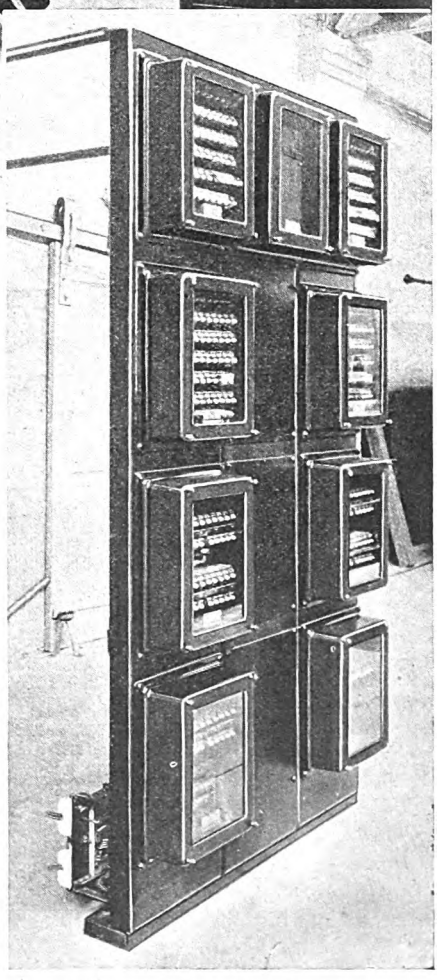
Steel-Panel-Mounted Supervisory Control

CONSTRUCTION of a new type for supervisory control equipment has been designed by the Westinghouse Electric & Manufacturing Company. The relays and circuits that have been used successfully in the past are included in the new equipment, but the method of mounting is entirely new. This supervisory control equipment is similar in appearance to other switchboard panels in the dispatcher's office and in the substation. The panels are of formed "stretcher-level" sheet steel construction, 16 in. wide by 90 in. high. The supervisory relays are mounted in metal cases similar to the way power relays have been mounted for years, a number of relays being mounted in a single case.

A set of synchronous visual supervisory control equipment for the control and supervision of twenty oil circuit breakers will have two steel panels at both the dispatching point and the substation. At the dispatching point one panel will have twenty escutcheon plates and any receiving meters, such as milliammeters or synchronoscopes, that may be required for remote metering or synchronizing. The escutcheon plates are equipped with a control key, red and green indicating lamps and pilot lamps. The other panel will have three supervisory relay cases mounted on it. One case will contain the master equipment and the two others will house the individual point equipment for the twenty points, ten points per case. At the substation one panel has three supervisory relay cases mounted on it. This panel is an exact duplicate of the one described above for the dispatching point. Four type MS interposing relays are mounted on the other substation panel. A type R remote metering transmitter may also be mounted on this panel.

This type of construction is not only similar in appearance to other switchboard panels, but it permits a more convenient layout in both the dispatcher's office and the substation, and in addition requires much less space.

Control desk



Relay equipment installation

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Association Activities

System a Prerequisite of Successful Bus Operation*

By Clark T. McConnell
President Cleveland-Ashtabula-Conneaut Bus Company

DESPITE the almost unprecedented popularity with which the motor bus has been favored I believe that most operators and the people generally interested in motor bus development are overoptimistic concerning future expansion. It is my firm belief that unless two things happen in the next year or two we can expect to find a decrease in motor bus popularity. These are, first, improvement in motor bus chassis and bodies, and, second, an increased efficiency in operation through systematic methods employed by the operators.

It is my belief that the manufacturers of bus chassis and bodies have been unnecessarily slow and dilatory in the improvement of their product. Up to the present time few manufacturers, if any, have considered the operator's viewpoint and problems and worked on their product accordingly. The manufacturer has not constructed equipment which could be operated and maintained at the lowest costs commensurate with the nature of the operation.

If the motor bus is to continue as a popular mode of transportation its operation must be made profitable. There have been too many failures in the motor bus business due to the ignorance of the operator who thought he was making money just because he was in a cash business and his daily receipts exceeded his daily expenditures. At the end of the first, second and third years, when the operator found that he had failed to set aside sufficient money to renew his equipment or replace it, he had to raise additional capital to pay for something that rightfully should have been charged to operating expense.

The manufacturer must of necessity build a chassis and body that under average conditions can be operated some four to five years before replacement is required. Such a body and chassis must not only be constructed rigidly but in such accessible form as to allow replacement and repair at a minimum effort and cost. I wish to prophesy that the manufacturer who, in the next three to five years, does not appreciate the operator's problems in the construction of his equipment will have no sale for his product.

Just as the manufacturer has been slow and negligent in improving equipment, so has the average operator in many cases been fatally negligent in systematizing his operation. This can be easily explained when we consider the many instances where motor bus operations were started by individuals with one or two operating units. Most of these operators had neither business nor transportation experience and training. They could without trouble take in their daily cash while driving the bus in the daytime, bank the money and pay their bills, and at night make their own adjustments and minor repairs. But as they grew and required additional equipment, they neither made preparation for operation on a large scale nor provision for proper maintenance of their equipment. As a result many a good operation has either been lost or is struggling with broken-down equipment and a decreasing patronage.

While the methods developed by our organization may not be new, they are the result of intensive study and have enabled us to effect considerable economies. We have divided our business into three separate and distinct headings:

1. Maintenance of Equipment.
2. Operation of Equipment.
3. Clerical and Office Management.

A definite system for maintenance of equipment is important not only for the purpose of keeping the equipment in good mechanical condition and thereby preventing breakdowns, but also for the purpose of keeping the maximum amount of equipment available for use during the peak-load hours of the day. There is too much money tied up in capital investment, interest thereon, insurance and general overhead which goes to waste when buses are laid up in the shop during hours when they could be in profitable use on the highway.

We have four garages located approximately 30 miles apart. In each of these shops we maintain a night force of mechanics. They do the major portion of the adjusting and mechanical work necessary to put the equipment in shape for operation the following morning. We also maintain a day force in the main garage at Cleveland to take care of daytime adjustments, breakdowns and heavy work.

In order that all cars have proper care, a chart system is absolutely necessary, either on a mileage basis or on a time basis. By this I mean the chart can indicate when certain things must be taken care of by the number of miles run, or by the number of days when the cars are used in regular daily operation. We are using the time basis.

In working on this basis we have a perpetual chart which is not changed from day to day and which can be used like a calendar. These charts should be made out for every part that requires attention, principally the following: Chassis greasing, differential greasing, driveshaft lubrication, motor oiling, magneto and generator oiling, shock absorber lubrication and steering gear oiling. Charts should also be made out for valve grinding, clutch adjustment, relining of brakes and inspection thereof, inspection of differential, transmission, driveshaft, steering gear, wheel bearings, generator and magneto.

Great saving can be made by daily inspection and proper inflation of tires. The same is true of batteries. Inspection of vacuum tank and carburetor is essential. We find it takes about 30 days for these parts to become dangerously saturated with dirt. A chart should be kept for piston and piston rings and the draining of the tanks on air brakes.

It is easy to secure forms for this chart system, but it is useless to have the forms without setting up the organization and having the management determined upon accurate compliance therewith. There are certain vital parts of the car that should be inspected daily or at the end of each run regardless of charts. These are the steering assembly, driveshaft and brake mechanism, bracket and lights.

Care should be taken in selecting labor-saving tools and equipment. There are many pieces of equipment which will pay for themselves in a short length of time in reduced labor cost the nature of which is peculiar to different operations, but the following are a few that have proved profitable to our operation: Chain hoist, small power drill, welding

Abstract of address presented at the annual convention of the Motor Bus Division, American Automobile Association, Philadelphia, June 15, 1927.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***July 19*—Central Electric Traffic Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.**

***July 22, 23*—Central Electric Railway Accountants' Association, Tuller Hotel, Detroit, Mich.**

***July 27-29*—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Biltmore Hotel, Atlanta, Ga.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, South Bend, Ind.**

***Sept. 13-15*—International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting. Book-Cadillac Hotel, Detroit, Mich.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit. Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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outfit, machine for cutting out connecting rod bearings to proper size, power emery wheel, electrical test bench, power washer, a battery charging outfit, hand presses, power Alemite grease gun, wheel pullers, electric soldering irons, wheel aligner and pneumatic air pump.

All drivers should be required to turn in a work card at night, after turning in their buses, stating whether the car is O.K. or not, and in the case of work to be done, they should state, in their own terms, just what they have found out of order. The foreman of the garage then takes this card and sets forth in mechanical terms the work to be done by the mechanics. All work cards should be registered and a register book is kept to see that none is lost. In the old way, we had numerous cards torn up by the mechanics, so that the blame could not be placed if the work was not done. The permanent record remedied this.

The importance of constant maintenance of bodies cannot be overestimated. There are many small rattles and defects which in the first instance may be minor in their nature, but which if permitted to pass without attention will require expensive repairs. It is also essential from the viewpoint of your patrons that the bodies be kept in first-class condition. To the average bus rider defects through neglect of the body are more apparent than defects in the chassis. There is nothing more annoying to a patron than a rattling window or door. The bodies should be renovated at least once a day as well as fumigated. We employ a body man at each of our main garages. These body men probably save us more money than any other laborers we employ. Body work which when done by outside companies has cost us as high as $500 is being done in our shops for frm $50 to $100. The body men are also able to eliminate all rattles and replace broken panels and fenders without keeping the equipment off the road at the peak hours.

We maintain our own paint shop. A bus is taken in every Monday morning, the body completely repaired and a thorough coat of paint is given it, including redecorating of the interior. While the painting is being done curtains are dry cleaned and, where necessary, new parts are installed. These cars are painted with a paint gun with quick-drying paint, which enables us to have the equipment back on the road the following Saturday to handle the week-end rush. We find that newly painted buses, aside from attracting business and arousing favorable comment, have the psychological effect of making the driver more careful in his handling of the equipment. We have also found it advantageous to change the color scheme occasionally. It causes comment and attracts business.

The first and most essential part of a motor bus operation is the operator. He must not only be a good driver but must be a salesman, he must be honest and courteous. It is necessary, therefore, to establish a system of investigation by way of application for position. The next step is the training of the applicant. The applicant is first tested as to his ability to drive, then put on with one of the older drivers, where he is trained as to the operation of the bus, names of the towns and the fare zones. He then drives a bus under the supervision of an experienced operator for three days, at the end of which time a report is turned in as to the applicant's qualifications.

The human element in the operation of a bus line is not to be disregarded. We make every effort to keep our employees in a satisfied and contented frame of mind. Following a principle that the success or failure of an operation depends primarily on the driver and that cheap or underpaid labor is expensive economy we have worked out a scale of wages which we believe is as fair and reasonable as could be expected. Our drivers are paid on the basis of 3½ cents per bus-mile for the first two years; after that they are increased to 4 cents per bus-mile and are given runs that will average them close to $200 per month. We give our employees a week's vacation with pay and a cash present for Christmas. We also carry life insurance for our men free of cost in amounts ranging from $500 to $2,000, depending on the length of time they have been with the company.

The third division of operation has been referred to as the office or clerical department. The methods employed by our company are complete in every detail. We are in a position to know at the end of each month from our statements the amount of revenue and expenses of operating each divison of our line. We know the amount of revenue on every run. We are thereby kept constantly in touch with the weak runs and are able to revise our schedules to meet the requirements and to eliminate loss. We are able to tell the cost of upkeep of each piece of equipment and know each month our weaknesses and our strength.

We have found it rather expensive to install our present methods and systems; in fact, more expensive than we had anticipated. However, we have been able to cut down and consolidate certain features of overhead and believe today that the methods used are as efficient as we can make them and as economical.

Although I am a strong advocate for modern and improved methods of organization and believe that they should be applied to the motor bus industry, caution should be taken by the small operators in systematizing their business. There are many "cure-all" accountants and systematizers who should be avoided and changes should be made slowly and carefully. System is vital to successful operation, but too much system is worse than none at all. Sound principles and business methods intelligently applied are the secret of a successful operation.

Railway Management Best Qualified to Find Place of Bus*

By B. W. Arnold
Manager Motor Coach Department, Chicago, North Shore & Milwaukee Railroad

SOME 30 or 40 years ago when the linotype machine was developed, adding a new tool to the printing industry, the publishers and printers who had previously been setting type by hand hailed the new invention as a useful tool in their trade. They installed the machines in their printshops, operated them by skilled printers and continued in the business which they had learned from the ground up. The result was a tremendous increase in the volume of printing produced and consequent benefit to the public.

The situation in the transportation industry is much the same as it was in the printing industry a generation or more ago. The motor coach has been developed and is a new and useful tool in the hands of skilled operators who have made transportation their life work. In the hands of inexperienced and irresponsible individuals it may easily become the reverse of useful, a disturbing and destructive factor in the industry, which in the long run can only be harmful to bus manufacturers.

There can no longer be doubt in the mind of anyone that the motor coach has a place, and an important one, in our scheme of transportation. We may disagree in details as to its proper place, but in the end I believe it will be found that the experienced electric railway operators are the men best fitted to put the motor bus in the place where it can be used to the greatest advantage in the service of the public.

The transportation field is a broad one. It embraces many problems, each of which may call for different treatment. The problems are so diversified that what is applicable in one situation may be utterly impracticable in another, although the two situations are seemingly alike. Transportation methods which are reasonably satisfactory, let us say in London, might not be workable in New York or in Chicago. The transportation problems of a nation are so vast and so complex that with all the available agents now at our command the public demand for transportation service never has been met fully in any country.

This public demand is growing year by year and will continue to grow indefinitely. As transportation companies engaged in serving the public, our business is to find ways of more nearly filling that demand, rather than indulge in foolish controversies over substituting motor coaches for electric railways or motor trucks for freight cars running on rails, steam and electric.

The real problem confronting the transportation companies is one of ad-

*Abstract of address presented at convention of Motor Bus Division, American Automobile Association, Philadelphia, Pa., June 15-17, 1927.

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justment, not of substitution. We cannot at this time afford to discard any of the tools of our trade, but we can and should find the best and most economical use to which we can put them, always keeping in mind the trust imposed upon us of giving the public the service it requires.

I am a firm believer in the motor coach. Its flexibility gives it a decided advantage over the car operated on rails under certain conditions. The latest types of motor coaches have seating capacity almost equal to that of the cars used on surface, elevated and subway lines in our large cities. They are lighter in weight than the smallest of our one-man cars of the Birney type. For certain classes of service they are better adapted than the electric car.

Fully recognizing the many advantages of the motor coach, I am firmly convinced that it has its very definite limitations. It certainly cannot now, and I doubt whether it ever can, take the place of the electric railway.

I am not sure that our experience with the motor coach as a substitute for the electric railway is extensive enough to be absolutely conclusive, in view of the constant changes being made in motor coach construction. The experience in Akron, Ohio; Des Moines, Iowa, and Bridgeport, Conn., where the motor bus was given full opportunity to prove its ability to take the place of the trolley car, was anything but satisfactory to the public. Its failure in those medium-sized cities, with the full support of the city administration in each instance and the sympathy of the people at first, does not inspire confidence in its performance in a great city where the rush-hour problem is much more serious.

Careful studies and traffic checks made by competent engineers in a number of large cities during the hour of maximum travel place the capacity of rapid transit lines operating trains of cars over a single track at from 35,000 to 50,000 passengers an hour. The capacity of surface lines operating cars in single units is from 14,000 to 16,000 passengers per hour and of motor coaches of the double-deck type about 6,000 passengers.

The greatest need of the large city today is for rapid transit. As population grows and spreads farther out from congested areas, the need of rapid transit facilities increases. Few will contend that this need can be supplied by the motor coach operating on the surface and sharing the roadway with other forms of vehicular traffic.

A concrete illustration of the difference in speed made by an elevated rapid transit line and a motor coach is seen in Chicago, where the two forms of transportation parallel each other. From the city limits on the north to the Loop under the most favorable conditions the schedule of the rapid transit line is 30 minutes, while that of the motor coach is 68 minutes.

In Indiana experience showed that the motor coach cannot take the place of the interurban railroad for long-haul traffic. It required considerable time, and cost the electric railroads and the motor coach companies a lot of money to find it out. The result of the experiment was a receivership for the motor coach company. In a public statement issued at the time by the receiver for the motor coach company he said: "It is becoming apparent that the operation of motor buses should be co-ordinated with existent steam and electric forms of transportation. The buses find it impossible to stand alone, but are logically indispensable in rounding out a complete, unified transportation system."

From my experience in the operation of electric railways and of motor coaches I have reached certain conclusions which may be summarized as follows:

In mass transportation the motor coach is not a substitute for the electric railway.

It is not adapted for rapid transit service, which is the greatest need of the hour in all our large cities.

In interurban service the motor bus is less efficient than the electric railroad in long distance travel. Its operation in competition with an electric railway capable of adequately supplying the needs of a territory is economically unsound and not in the interest of the public.

Operated in conjunction with the electric railway the motor coach is not only useful but indispensable as a part of any properly co-ordinated transportation system.

In many classes of transportation service the motor coach is better adapted to meet the public requirements than is the electric railway.

Electric railway managers, experienced in the business of transportation, are the men best qualified to find the proper place for the motor coach and utilize it to the best advantage. Instead of assuming an indifferent if not a hostile attitude toward the motor coach, the electric railway companies should welcome it as a valuable aid in helping to solve many of the problems confronting them. Its usefulness has been fully demonstrated, and if its proper place in our scheme of transportation has not been found the fault lies largely with the electric railway companies that have failed to appreciate the value of this new tool of their trade.

American Association News

Coffin Contest Date Extended to Aug. 1

ON JAN. 17, 1927, the Charles A. Coffin Prize Committee of the American Electric Railway Association issued an invitation to all electric railways to enter the 1927 contest. At that time the committee set the final date for the receipt of presentations on July 15. In a letter dated March 26, announcing the publication of the digest of the 1926 presentations, "Making Transportation Pay," it was erroneously stated that the 1927 presentations would be received up to Aug. 1.

This has led to some confusion and the committee, therefore, has decided that in fairness to all concerned the final date of receipt of presentations for the 1927 award shall be extended to Aug. 1. A notice to that effect has been sent to all companies that have indicated their intention to enter this year's contest.

Special Bulletins

FOLLOWING is a list of special reports being prepared by the Bureau of Information and Service of the American Electric Railway Association. They will be available to member companies upon request:

Bulletin No. 148: ACCIDENT STATISTICS OF ELECTRIC RAILWAYS, 1926. A comparative summary and analysis of accident statistics reported by 195 electric railways, for the years 1926 and 1925. Some of the items covered are as follows: Total number of accidents, number of accidents involving motor vehicles, number of car collisions, number of persons injured, number of fatalities, total cost of claims, ratio of total cost to gross earnings, expenses of claims department, number of car-miles run and number of passengers carried per accident, details of claims department expenses, etc.

Bulletin No. 149: ACCIDENT STATISTICS OF MOTOR BUS LINES OPERATED BY ELECTRIC RAILWAYS, 1926. This is the first comprehensive summary of motor bus accident statistics that has been compiled. The bulletin includes the reports of 68 bus companies operated or controlled by electric railways and gives substantially the same information for motor bus operations as is given for electric railway operations in Bulletin No. 148.

Bulletin No. 150: COMPARISON OF ELECTRIC RAILWAY OPERATING CONDITIONS, OPERATING EXPENSES AND RESULTS OF OPERATION ON VARIOUS UNIT BASES—Part 2, INTERURBAN LINES. A tabulation of data for interurban lines similar to that given last month in Bulletin No. 145 for city lines. The data include the average speed, number of revenue passengers per car-mile, per mile of track, per car operated, operating revenue, operating income and net income per mile of track, the cost of maintaining plant and equipment per car-mile and per unit of property maintained, and operating costs on various unit bases of comparison.

Bulletin No. 151: TREND OF MATERIAL PRICES. A new edition of the association's regular bulletin on relative costs of materials, bringing down to date the trend of prices of materials used by electric railways based on data contributed by the manufacturers of such material.

In addition to the above the following supplements have been prepared, bringing the information to date:

Supplement No. 22 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 4 to Bulletin No. 129: Wages of Trainmen.

Supplement No. 4 to Bulletin No. 130: Wages of Bus Men.

Cost of Living Studies (Bulletin No. 152).

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News of the Industry

Six-Day Week in Boston

Slight increase in hourly pay, but reduction in weekly wage results—Explanation by management

A SIX-DAY week has been established by the Boston Elevated Railway, Boston, Mass., for all its employees. A new wage agreement for 1927 has just been adopted which carries this provision. Its 4,000 blue uniform men, motormen and conductors, have been working seven days a week, and the rate of wages under the 1926 agreement was 72½ cents an hour. This rate is raised to 75 cents an hour under the new agreement, making $36 a week, or about $5 a week less than the men earned when working seven days a week. Operators of one-man cars and of buses will receive 85 cents an hour, maintaining their differential. Other provisions in the agreement are the same as in 1926.

The new agreement was reached by direct negotiations between the Board of Public Trustees and a committee from the union, without referring anything to arbitration. It has been ratified by the men. One of the immediate results will be the re-employment of a number of men who had been laid off.

For three years the rate of pay was 72½ cents an hour, in 1923 it was 70 cents, in 1922 it was 63 cents.

A statement issued by the management of the elevated said:

> This is made possible by the men who have been working regularly seven days a week accepting a substantial reduction in weekly pay, which is offset in part by an increase of 2½ cents an hour in the hourly rate of the classes affected, making the basic rate for motormen and conductors 75 cents an hour.
>
> Many of the classes of elevated employees already had a six-day week and their rates and conditions remain unchanged.
>
> This is the final step in applying the fundamental principle which underlies the state law that requires one day off in seven for employees engaged in transportation, except when they request otherwise.
>
> The abolition of the seven-day week has been the subject of discussion since 1919 and the question of its abolition or modification has been considered in several arbitrations. In 1920 the neutral arbitrator in his award expressed the opinion that no set of men should be obliged to work more than six days consecutively except in case of emergency. He said: "Neither the employing company nor the public is entitled to such service as an established proposition and schemes should be evolved in the future to eliminate it."
>
> It seemed to the Board of Public Trustees that the soundness of this view could not well be questioned and for some time it has felt that a situation under which some men worked practically 365 days in a year called for a change. The willingness of the men this year to co-operate has made it possible to bring conditions in harmony with the purpose of the statute and the practice generally prevalent in other industries.
>
> Inasmuch as the general manager felt reasonably confident that the cost of service for the ensuing year under the proposed agreement would be met by the estimated receipts it seemed to be the proper time for making this highly desirable change in working conditions.

Training Course at Cleveland

The committee on education of the American Electric Railway Association has issued an informative pamphlet on the training course for foreman conference leaders to be conducted from Oct. 3 to 8 inclusive at Cleveland, Ohio, during the convention of the American Electric Railway Association. The sessions will occupy one-half of each day or six half-day periods in all. Railways interested in the movement are invited to send representatives to Cleveland. The pamphlet contains comments of participants in the 1926 conferences.

The training course is under the auspices of the committee on education and directly under two of its members, H. H. Norris of the Boston Elevated and A. J. Sarré of the New Orleans Public Service. Frank Cushman of the Federal Board for Vocational Training will also assist in the work.

Treat the Matter Intelligently!

THE public should bear in mind that transportation is one of the necessities of life; that difficulties beset any transportation agency in a rapidly growing community, and, more particularly, where a new transportation agency, such as automobiles, develops. Such a new agency as this may exclude former methods of transportation; it may compete with them, or it may supplement them, the last result being the most desirable one. The whole subject should be treated with intelligence, with fairness and with patience, and it should be remembered constantly that no utility can perform its function in a community unless it has revenues sufficient to provide for extensions, for depreciation and for a reasonable return upon the capital invested. At the same time, the public has a right to demand a sincere, intelligent, active policy on the part of the managers of utilities to deliver proper service to the community.
—*Louisville Courier Journal.*

New Base for Negotiations

United Railways no longer willing to negotiate on $60,000,000 valuation —Present grant has years to run

UNLESS the city of St. Louis, Mo., accepts the terms set out in the tentative service-at-cost franchise prepared by city officials and representatives of the reorganization committee of the United Railways by July 15, negotiations between the city and reorganizers on the basis of a $60,000,000 rate-base valuation will be terminated. After that date all negotiations will be on the basis of rate-base valuation fixed by the Missouri Public Service Commission or the United States courts. A letter to this effect has been sent to Mayor Victor J. Miller. It is expected that eventually the Public Service Commission will fix a valuation of $75,000,000 with an allowed return of 7 per cent.

The principal hitch has been Mayor Miller's refusal to approve a 7 per cent return on the company's investment. He has contended that under a service-at-cost plan of operation a 6 per cent return is sufficient.

The tentative draft of the service-at-cost measure was completed about a year ago. It has been hanging fire ever since.

Sam W. Greenland, representative of the reorganization committee and of the St. Louis Public Service Company, the proposed successor company, said that the letter to Mayor Miller should not be regarded as an ultimatum, but that future franchise negotiations would be on a basis different from the $60,000,000 valuation. Failure of the city to act by July 15 will not terminate negotiations on a new franchise.

On July 5 the new fare schedule of 8 cents or two tokens for 15 cents went into effect. Children's fares remain 3 cents.

The United Railways still has a blanket franchise extending from twelve to eighteen years, so is not entirely dependent on the city granting a new franchise at this time. If it does not receive a new franchise it probably will set up an amortization fund to take care of outstanding securities by the time the franchise does expire.

It appears now that the failure of the St. Louis city administration to agree on an equitable franchise to be granted to the St. Louis Public Service Company, when that organization takes over the properties of the United Railways, now in receivership, may cost the city treasury about $2,000,000 on the pending mill tax judgment of 1919.

The question of the payment of the entire mill tax judgment of $2,396,321 with interest at 6 per cent since Jan. 13, 1919, was one of the points raised in the tentative franchise prepared and di-

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cussed about a year ago. It was suggested then that this entire amount be paid to the city over a period of years.

Since Mayor Miller has failed to agree to a 7 per cent return on a $60,000,000 valuation, and members of the reorganization committee have threatened to call off negotiations with the city the mill tax judgment might have to take its place with other general claims against the system. Settlement of such claims must yet be approved by United States Judge Faris. He has jurisdiction over the receivership and has indicated that no interest can be allowed to general creditors on their claims. If the mill tax judgment is treated on that basis the city would lose $1,198,160 in interest up to July 13. It would probably also be forced to accept about 60 per cent of the principal sum due in final settlement or another loss of $959,321.

Completion of Great Northern Electrification Expected Jan. 1

At the present rate of progress, with speed records being broken almost every month, the Great Northern Railroad's 8-mile tunnel in the Cascade mountains will be ready for service before the end of next year. Electrification of 74 miles of line, including that through the tunnel, will be completed at the same time. Ralph Budd, president of the Great Northern, has indicated that while the Great Northern is electrifying a portion of its line through the Cascades, there is no immediate intention of electrifying any large proportion of the system. The Cascades electrification was undertaken to solve a particular problem set up by a mountain range summit difficult to cross. In discussing the matter. Mr. Budd said:

On the basis of economy, the high initial cost of electrification presupposes a heavy traffic in order to absorb the large overhead expenses. Not many railways have traffic so dense as to justify the expenditure, hence in most cases electrification is made on account of one or more other reasons, such as avoidance of smoke and gas in tunnels and snow sheds, elimination of fire hazards, speeding up of train service, particularly over mountain grades, and consequent increase in capacity of the line without building additional tracks in locations where such construction would be especially costly, smoke abatement in cities and solving terminal congestion problems.

In addition to the $10,000,000 which will be spent in construction of the tunnel, approximately the same amount will be required for electrification of the tunnel division and the revision of 17 miles of track on the east approach to the tunnel.

Celebration Reunites 400 Baltimore Veterans

Although looking forward is the commonly accepted formula for retaining youth, frequently senescence escapes those who find their chief delight in looking back. This habit evocative of pleasant memories is becoming an event in Baltimore when members of the 25-Year Club gather together for their annual outing, hear many stories of "when you and I were young" and indulge in all pastimes with the dynamic earnestness and hearty enthusiasm characteristic of the youngsters.

At Bay Shore Park on June 27, 422 veterans of the United Railways & Electric Company celebrated the fourth annual reunion of the 25-Year Club. According to reports, it was a crowded afternoon, what with bathing, bowling, aero swing, racer dip, shooting, rough riding exhibition in the pony corral, candy booths and kewpie doll stalls. When the day was done a good dinner and good music followed, and then Thomas A. Cross, retiring president of the club, presided at the election of officers.

The gathering was notable for more than one reason, but principally because thirteen ladies took part in the festivities —all young members of the 25-Year Club. Only thirteen, with more than 400 men! That was their lucky day.

It is at such reunions that the salutary atmosphere of employee relationship is breathed which becomes the life-giving serum for these veterans, who are near and yet very far from senility.

The 25-Year Club of the United Railways was organized March 4, 1924, with 234 members, all of whom had been with the street railway of Baltimore 25 years. The membership has grown to 432 members, as additional employees have become eligible through 25 years of service.

Pittsburgh Parking Violators Face "Drastic" Penalty

An open letter under date of June 16 addressed to the Mayor of Pittsburgh, Pa., by the Better Traffic Committee outlines the activities of that committee generally, but specifically to state its support of the Mayor's veto of the "reduction of parking penalties" ordinance.

The commmittee believes that the "reduction of parking penalties" ordinance, recently passed by the Council against the recommendation of the Better Traffic Committee, was a step in the wrong direction; that the increased parking in the business streets, which is bound to result under a reduced penalty, will react as an "automobile fence" around business houses in every district of the city. It is the belief of the committee that the vast number of citizens going daily into the downtown triangle should receive first consideration, and that the automobile should give way on the American theory of "the greatest good for the greatest number." The Better Traffic Committee states that it is interested in seeing that the greatest number of people of Pittsburgh get the maximum service from their streets in the form of transportation use.

The statement mentions the number of meetings held by the committee and the time consumed. To illustrate the many phases to the problem of traffic the committee has attached to its letter a list of some of the many things which have been studied carefullly by the Better Traffic Committee during the past year. The committee was appointed by Mayor Kline in May, 1926.

Permit Card in San Antonio

A new fare schedule providing for a 10-cent cash rate, three tokens for 25 cents and a nickel card good for one week to sell for 30 cents went into effect on the lines of the San Antonio Public Service Company, San Antonio, Tex., on July 10. About 12,000 nickel cards were sold the first week. As the city administration had not given its approval the permit card was put in over the latter's protest.

Where the heavy hand of time leaves no impression. Even the camera man said of the

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Improvement Program in Dallas 75 Per Cent Complete

The Dallas Railway & Terminal Company, Dallas, Tex., has completed about 75 per cent of the construction program authorized by what is known as Everman Plan No. 4, under which it was granted an increase in fares to 7 cents cash with five tokens for 30 cents in return for an expenditure of $1,466,297 in improvements and betterments. A list of main projects completed under this agreement and their cost, as shown by records in the office of John W. Everman, supervisor of public utilities, includes the following:

STATEMENT OF PRINCIPAL DALLAS IMPROVEMENT ITEMS

Pay balance on car trust certificates	$137,484
Live Oak street rebuilding	54,000
Paving assessment— Jefferson Avenue	12,000
Second Avenue extension	15,000
Sunset extension	5,000
Vickery extension	15,000
Second Avenue paving	14,140
Commerce Street paving	12,000
Ferney Avenue paving	20,650
Pave Lancaster intersection	376
Pave Polk Street intersection	395
Pave Ross Avenue	773
Rebuild Elm Street	70,000
Purchase 30 Peter Witt cars	450,000
Install electric feeders	35,000
Pave Marlborough	12,893
Extend State Street line	48,000
Extend Oak Lawn line	40,000
Pave Fairmount Street	12,000
Rebuilding and pave McKinney Avenue	26,000
Pave Exposition Avenue	5,006
Pave four intersections	1,284
Pave two intersections	326
Total estimated costs of completed improvements	$1,059,331

Several big projects called for under the Everman Plan No. 4 are now under way. These include: Rebuilding tracks and paving portions of Cole Avenue between Bowen and Lemmon, $22,000 (about one-half completed); paving of Bryan Street and replacement of old track and roadbed with heavier steel and new ties, $75,000 (the Texas Electric Railway's interurban cars use the line of Bryan Street); conversion of fifteen additional two-man street cars of old type to modern one-man type, $50,000.

Among the projects yet to be done are: Junius Heights line extension, $59,000; rebuilding line on Tyler Avenue from Seventh to Jefferson and paving portions of this street, $35,000; rearrangement of tracks and paving on Parry Avenue at Fair Park, $1,450; paving on Waverly Drive, $7,000; rebuilding tracks on Upper Main Street, $83,000; rebuilding line on Collette Avenue, $24,000.

Efforts Made to Save Indiana Line

Boonville, Ind., newspapers are appealing to the public for more support for the Evansville, Suburban & Newburgh Traction Company, which operates from Evansville, Ind., to Boonville and Newburgh. In a recent issue the Boonville *Enquirer* pointed out that Posey County would soon experience a change in mode of transit from points in that county to and from Evansville if the Indiana Public Service Commission granted a request made by the Evansville & Ohio Valley Railway. In this petition permission was sought to substitute buses and operate them along State Highway No. 62 and do away with the railway that runs from Evansville to Mount Vernon. The company claims inability to operate its lines with a profit.

Winnipeg System Doing Well

The monthly bulletin published by the Winnipeg Electric Company, Winnipeg, Man., for its shareholders, states that the company has kept abreast of modern developments in the transportation business by providing supplementary bus services in various city and suburban districts. At present the company has a fleet of 30 buses of modern design and construction in operation.

In dealing with the effect of the increase in motor cars on the business of the railway, the bulletin says that between 1920 and 1924 the company experienced a decrease of 10,000,000 in its passengers, but that now the tide seems to have turned, for between 1924 and 1925 the number of revenue passengers jumped from 55,077,901 to 57,985,144.

Best of all the increase in passengers is being maintained this year. Fares in Winnipeg average only 5.86 cents. The cash fare is 7 cents, but special tickets are sold to children and workmen. The bulletin concludes by indicating that the future holds more promise for the transportation end of the company's operations than has been the case in the past twelve years.

Contracts Being Drawn for Rochester Tunnel Operation

The office of Corporation Counsel Clarence M. Platt of Rochester is engaged in drafting contracts between the city and the New York State Railways, interurban lines and the four steam railways for use of the city-built subway in the bed of the abandoned Erie Canal in the heart of Rochester, N. Y.

The Council has approved a plan whereby the New York State Railways is to operate the line for a trial period of three years, under a contract similar to, yet different in details from, the service-at-cost agreement under which the railway and bus systems of the city are operated.

It was found necessary to draft separate contracts with each system using the line. The railroads affected are the Rochester & Eastern, Rochester, Lockport & Buffalo and the Rochester & Syracuse Railroads, all interurbans, and the steam lines are the Lehigh Valley, New York Central, Erie, Pennsylvania and Buffalo, Rochester & Pittsburgh.

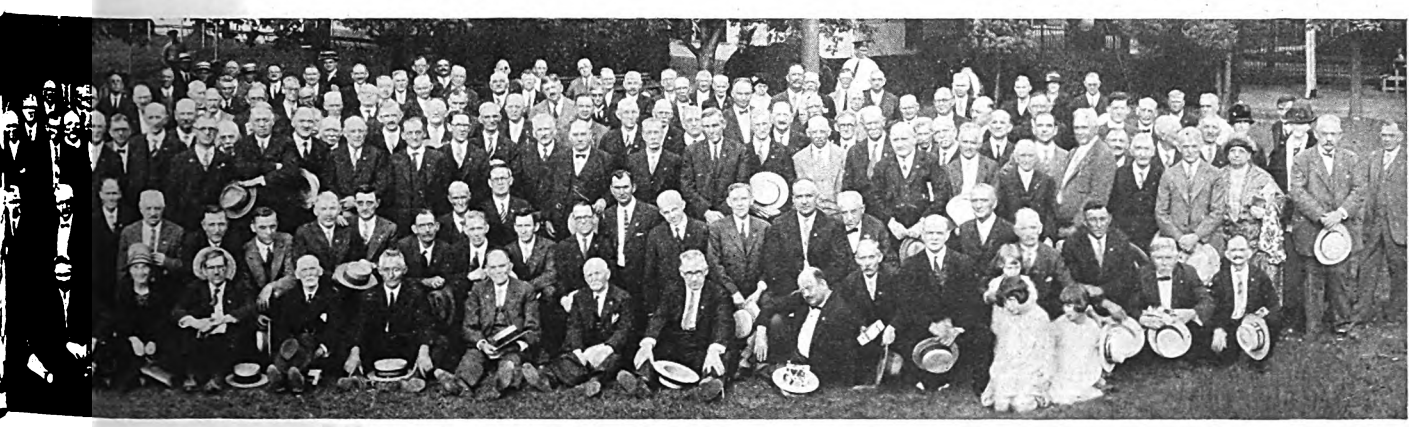
According to present indications the subway will start operations about Aug. 15. All of the electric signals may not be installed then, but it is thought that the interurban cars will start using the railroad then so that the heavy cars may be taken off the city streets.

Rotogravure Advertising by Boston "L"

The Boston Elevated Railway, Boston, Mass., entered in the rotogravure section of two recent issues of the Boston *Traveler* a full-page advertisement bespeaking the service and safety of that system.

The elevated, the surface car and the motor coach were pictured with a sketch of "Boston" and the shore line in the June 25 *Traveler* in conjunction with paragraphs telling of the convenience, safety, service, dependability, courtesy and genuine interest of the system in the welfare of the passengers.

The advertisement of July 2 showed by means of nine pictures, 2¼ in. x 3 in., and two larger pictures about twice the size of the others, "How the Boston Elevated Safeguards the Lives of 1,000,000 Persons Daily."



United Railways & Electric Company employees, "They may be veterans, but they don't look it."

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Present Wage Rates Accepted by Connecticut Men

After a week of agitation, during which it was thought the wage disagreement between the Connecticut Company, New Haven, Conn., and its employees would have to be settled by arbitration, the clouds suddenly lifted and the men decided to accept the present wage rates for another year.

By accepting terms with the railway the men will work at the following rates: Two-man car operators will receive 62 cents an hour; one-man car operators 69 cents an hour. The men sought increases to 75 and 90 cents in respective instances. The Connecticut Company has conceded a slight change in working hours.

Former Railway Man Heads Ad Club

Hudson R. Biery, public relations director of the Cincinnati Street Railway, Cincinnati, Ohio, was elected president of the Advertisers' Club of that city by the board of governors at the Chamber of Commerce. Mr. Biery resigned as assistant to the receiver of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., in September, 1925. He went to Indianapolis in October, 1923. Previous to that he was purchasing agent of the Union Traction Company at Anderson, Ind. He was with the Indianapolis & Cincinnati Traction Company during the extensive rehabilitation carried out in 1923 and in 1924.

Low Rates for Employees

The Pacific Electric Railway, Los Angeles, Cal., has announced that the company will continue to operate the Redondo Beach resort during the coming summer season and employees are reminded that they can obtain special reduced rates at the bathhouse and ballroom. Special books of tickets, seven for $1.35, are issued at the bathhouse to employees, and special books of dance tickets include 40 for $1.

I. C. C. Concludes Piedmont & Northern Hearing

Ten days after it started at Charlotte, N. C., the hearing on the petition of the Piedmont & Northern Railway, an electric line, for permission to extend its lines was concluded.

The hearing revolved around the desire of operators of the electric railway, owned by the James B. Duke interests, to complete the gap between Spartanburg, S. C., and Gastonia, N. C., and to extend the road to Winston-Salem, N. C. It developed into one of the hardest railroad fights in years.

During the proceedings plans were divulged for a new trunk line system to the South through communication of the routing of New York and Western freight over the Southern Railway to connect with the Georgia & Florida Railroad at Greensboro, N. C., and thence run into Florida.

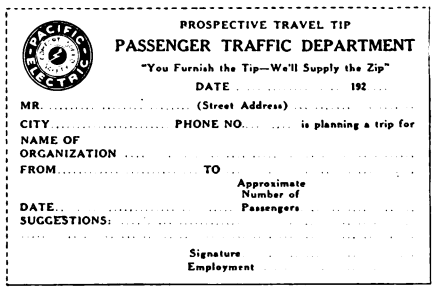
Testimony by experts for the opposing railroads, including the Louisville & Nashville, Southern Railway, Carolina, Clinchfield & Ohio and the Atlantic Coast Line, made it appear that the electric railway was likely to become a very important factor in the coal traffic flowing into the great industrial region of North Carolina and South Carolina.

The hearing was closed after counsel for the Piedmont & Northern announced that their rebuttal testimony had been concluded and attorneys for the Southern Railway had introduced a number of documents into the record.

Direct connection by rail between the Virginia coal fields and the Piedmont section to the south would be established with construction of the proposed lines, and a through rail route from the Carolina sections into the north and west provided. The proposed new trackage would run from Gastonia, N. C., to Spartanburg, S. C., and from Winston-Salem to Charlotte.

Travel Tip Campaign in Los Angeles

At this the beginning of the outing and excursion season an appeal has been made to the entire family of the Pacific Electric Railway, Los Angeles, Cal., to assist in making the 1927 season the banner one in its history. The employee is enlisted as a personal solicitor in supplying the passenger traffic department with tips concerning prospective group passenger movements. Upon the receipt of tips, traveling passenger agents are assigned to make personal calls, to quote fares which are considerably lower than regular fares when a large group is handled, to suggest locations, to help to plan and to offer assistance in arranging details of the contemplated trip.


PROSPECTIVE TRAVEL TIP
PASSENGER TRAFFIC DEPARTMENT
"You Furnish the Tip—We'll Supply the Zip"
DATE ... 192 ...
MR. ... (Street Address) ...
CITY ... PHONE NO. ... is planning a trip for
NAME OF ORGANIZATION ...
FROM ... TO ... Approximate Number of Passengers ...
DATE ...
SUGGESTIONS: ...
Signature
Employment

Blank on which business tips are recorded

Through its company paper the railway announces that the situation this year with respect to supplying equipment for extra movement is better than any year previous "and in the handling of this business nothing will be left undone in the way of making patrons highly pleased with their outings and our service."

For added convenience a blank form has been printed, reproduced herewith, showing information desired when turning in business tips.

Surface Lines Franchise in Chicago Extended

The City Council of Chicago, Ill., by a vote of 38 to 4 has extended for four months the franchise under which the street railway lines are now operated. The original franchise granted in 1907 expired on Jan. 31 of this year. A six-month extension was then voted, bringing it up to July 31. Bills looking toward a settlement of the matter failed in the Legislature, but a special session seems to be in prospect.

Utility Makes Gift to Higher Education

For the next five years an appropriation of $10,000 will be made by the Public Service Electric & Gas Company of New Jersey to Princeton University to be used in pure science work in chemistry. Thomas N. McCarter, president of the utility, explained that his company recognized that if industries with which it was concerned were to develop, the work of pure science had to continue and be supported by those who profited from its results.

Chicago Railways Will Pay Bond Interest Aug. 1

With traffic on the Chicago Surface Lines establishing new high marks each month and total revenue showing a favorable increase, the Chicago Railways, operating the north and west side lines, has announced its intention to pay the semi-annual interest due on Aug. 1 on all classes of bonds, although the principal of the bonds is in default.

It is expected that attorneys for the receivers of the company will within a few days present an application to the federal court for authority to make the interest payments. This plan applies to all the company's bond issues except the income bonds, payable if earned next May.

In endeavoring to maintain interest payments the company will follow the example of the Chicago City Railway, which announced last month that the semi-annual interest due on Aug. 1 on its bonds would be paid.

$300,000,000 Bond Proposal Opposed by Realtors

Taxpayers were urged to vote against the proposed $300,000,000 constitutional amendment to be submitted this fall in a statement issued by Stewart Browne, president of the United Real Estate Owners' Association, on the ground that "money can't be earmarked" and that the increase in the city's borrowing capacity authorized by the amendment would be used for recapture of subways. Mr. Browne asserted that since the city could use other borrowing power for recapture if the amendment passed, the prohibition that the identical

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$300,000,000 should not be used for recapture was meaningless. Mr. Browne said:

Transit unification, as discussed in the Transit Commission open hearings with Mr. Untermyer as counsel, has developed into the proposed purchase of existing subways by the city and the $300,000,000 will be used for this purpose. The opinion of the realty interests is that if the existing and new subways are municipally operated they will be run extravagantly and inefficiently, and with the sole purpose of increasing the number of city employees for voting purposes.

Ohio Line Recoups Losses

The Dayton & Troy Electric Railway, operating out of Dayton, Ohio, is doing more business than ever before following the installation of new rolling stock and equipment during the past few years. This equipment is being operated on a regular schedule, serving a wide territory, reaching the upper part of the Miami Valley and the northern part of Ohio.

Some time ago the Dayton & Troy Electric Railway expanded and improved its freight service, so it is now possible for second morning delivery of freight to Chicago or Pittsburgh. Many Dayton manufacturers and merchants have been availing themselves of this rapid freight delivery.

Fares Increased in Kalamazoo

Increased fares went into effect on July 7 on the Kalamazoo lines of the Michigan Electric Railway as the result of action taken unanimously by the City Commission. The new fares are 10 cents for cash rides instead of 8 cents and three tokens for a quarter instead of four for a quarter. Increase in the fares was voted after the commission heard a report showing the company lost heavily last year and declaring the only alternative would be abandonment of railway service for a substitute mode of transportation to be provided by the city itself.

West Penn Veterans Honored at Sixth Annual Banquet

Employees who have been in the service of the West Penn System, Pittsburgh, Pa., for twenty years or more were honored at the sixth annual banquet, held at McCreery's, Pittsburgh, on May 26. Twenty, 25 and 35-year service buttons were presented to the employees of the West Penn Power Company by President Gadsby and to the West Penn Railway employees by President H. L. Mitchell. This year's banquet in honor of the veterans was distinguished from its predecessors by the presence of H. Hobart Porter, president of the American Water Works & Electric Company, who made the main address of the evening. More than 1,000 employees of the companies comprising the West Penn System were present.

Terminal Garage at Morden Aids London Parking Problem

Commuters living on the southwestern outskirts of London are helping to solve the city's traffic problem by driving their cars as far as the terminal garage at Morden and proceeding the rest of the trip by railway, thus effecting automobile and railway cooperation. The garage was opened last September by the City & South London Railway. Since that time more than 1,700 vehicles have been housed, many of them regularly. The length of the day for garaging has been extended from 5 a.m. to 1 a.m., but the premises are never closed. Petroleum and oil are supplied and repair facilities are provided. A breakdown lorry is also provided, and tires and batteries can be bought there.

Paris Subway Receipts Gain

Paris subway receipts for the first quarter of 1927 are quoted at 93,890,541 francs and the number of passengers carried at 138,956,923, according to an announcement made by the Trade Commissioner at Paris to the Department of Commerce. The number of passengers in this period is nearly 2,000,000 patrons fewer than for the first quarter of 1926. Increase in fares for both first and second class subway service, however, swelled the receipts during the first quarter of the present year to 21,265,338 francs in excess of those for a similar period in 1926.

Italian Railway Electrification Progressing

The electrified portion from Pistoia to Bagni of the Porretta Railway of Italy was opened recently. This is the first section of the Florence-Bologna line, which will be opened to traffic before the end of the present year. Electric power for this railway comes from Santa Croce in Venetia and Liro in the Alta Valtellina and is transformed near Bologna. During the year another 865 km. of track will be converted. By the end of 1928 it is estimated that there will be a total of 1,600 km. of electrified lines in Italy.

Partial Electrification in Brazil Will Be Completed Soon

Plans of the Paulista Railway in Brazil call for the completion this year of the electrification from Rio Claro to Rincao, the end of the broad gage line. This extension of about 94 miles will bring the total of the electrified line to 177 miles. The Paulista is the first steam road in Brazil to replace steam locomotives with electrics. The first electric operation was started in 1921 from the terminal point, Jundiahy, to Campinas, a distance of 27 miles. In 1925 the electrified zone was extended approximately 30 miles from Campinas to Tatu, and last year another 25 miles was added, from Tatu to Rio Claro.

For the electrification of the final section, from Ria Claro to Rincao, the International General Electric Company will supply equipment for two substations and three 145-ton passenger locomotives, and Milliken towers with Locke insulators of Hewlett suspension type for double transmission line will be used.

The original substation is of 4,500 kw. capacity and all of the others 3,000 kw. The Paulista Railway serves a coffee-producing area to the northwest of São Paulo. Its terminal, Jundiahy, is about 37 miles inland from that city and connects there with the São Paulo Railway, which is the connecting link with the port city of Santos.

Lisbon Issues 50 Per Cent Stock Dividend

At the annual meeting held in London, June 22, 1927, of the Lisbon Electric Tramways, Ltd., of Lisbon, Portugal, the directors recommended a 50 per cent stock dividend. The earnings of the Companhia Carris de Ferro de Lisboa for 1926 showed income, after operating expenses, fixed charges and payments to the retiring sinking fund, of £230,826, with a credit balance from last year of £9,122. After paying interest on the preferred stock, 6 per cent on the common stock, £100,000 to the general reserve and £17,000 to other reserves, it was possible to use £51,066 to pay the final preferred dividends, which were in arrears, and carry a balance of £8,307 to next year. As there was an accumulated reserve at the end of the year of £320,755, it was decided to issue 317,013 common shares at £1 each in the form of a stock dividend. During 1926 the tramways carried 97,422,768 passengers, compared with 89,687,293 in 1925.

Swiss Line Palezieux to Berne Electrified

Change from steam to electric trains in Switzerland on the route between Palezieux and Berne by the way of Fribourg has necessitated the reconstruction of six bridges. The heaviest work was done on the Grandfey viaduct, which crosses the River Sarine near Fribourg. This bridge, the longest and highest in the Swiss Federal Railroads system, is 1,255 ft. long and 262.5 ft. high. The cost of its reconstruction was 3,250,000 Swiss francs.

Electric Traction Progress in Poland

The Société Chemins de Fer Electriques Suburbains has obtained the concession for the construction and working of an electric railroad, about 30 miles in length, connecting Warsaw, Grodzisk and Zyrardow. Work is well advanced on the construction of the line as far as Grodzisk, 20 miles.

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Recent Bus Developments

Missouri Bus Applications Besiege Commission

With Missouri's new bus regulation law effective on July 3, the State Public Service Commission is now receiving many applications for certificates of convenience and necessity for the operation of bus lines on the highways of the state. There are approximately 100 bus lines using the streets and roads of the state and it is expected that all of them will apply for the certificates that will enable them to continue in business. Hearings on the various applications will begin within the next few days and will continue for a month or more, until all of the petitions have been disposed of.

The first application for increased bus fares was received by the state commission on July 5. The Springfield Traction Company, Springfield, Mo., which operates buses in conjunction with its car lines, asked for an increase in bus fares from 5 cents to 7 cents, contending that the buses had been operating at a loss. The Springfield car fare is 7 cents. When the voters of Springfield passed an initiative ordinance in 1921 authorizing the traction company to take over and operate a number of bus lines owned by independent operators they fixed the bus fare at 5 cents.

The new bus regulation law defines the motor vehicle, motor carrier, public highway and common carrier; vests the public service commission with authority to license, supervise and regulate the motor carriers; states that the charges must be just and reasonable; requires the carrier to obtain a certificate declaring that public convenience and necessity will be promoted, and forbids any discontinuance of service without an order from the commission. It also fixes the license fee, which ranges from $40 to $230 annually; requires the filing of a liability insurance policy or bond, provides for distribution of safety rules and regulations by the commission and contains sections necessary for the enforcement of the law.

Jitneys Kept Out of Downtown Miami

Circuit Judge Atkinson has indicated that he will hand down an order in favor of the city and the Miami Beach Railway in the jitney litigation. Unless his ruling is reversed by the Supreme Court, the order will permit the city to enforce an ordinance that will rule "jitneys" from the downtown streets.

Attorneys for the city and the Miami Beach Railway, defendants in the action, have been instructed by Judge Atkinson to draw up an order in their favor. This is being done by John P. Stokes, who represented the city with City Attorney J. W. Watson, Jr.

Through an agreement of counsel for both sides, enforcement of the ordinance has been withheld pending the decision. The jitney operators declared the ordinance to be unconstitutional and attacked the contract under which the railway operates the city-owned buses.

The new ordinance is based on the belief that the jitneys constitute traffic hazards and increase congestion. Jitneys will be permitted to operate to the streets bordering the congested area, but will not be allowed to come downtown.

Rights Sought in New Rochelle

Application was made to the City Council of New Rochelle, N. Y., on June 20 by the Third Avenue Railway for permission to operate buses. It was stated that a similar application would be made to the Public Service Commission. It was said that Third Avenue officials would consult with Mayor McLaughlin with the idea of making White Plains the terminal of another line. City officials of Mount Vernon and the village presidents of Pelham, Pelham Manor and other communities, have been approached by Third Avenue Railway officials in connection with the proposed bus lines.

Louisville Railway Directors Favor Bus Deal

Directors of the Louisville Railway, Louisville, Ky., on July 7 authorized the purchase of the People's Transit Company, a bus concern, which operated six machines on the streets of Louisville for a short time in January. The deal will not actually be closed until a clear title can be obtained to all assets and provided that other details of the negotiations are satisfactorily arranged. The People's Transit Company was barred by injunction obtained by the Louisville Railway from operating on the streets of Louisville for lack of a franchise and later the Court of Appeals upheld the lower court's decision.

Several days ago officials of the railway conferred with Mayor Joseph T. O'Neal about increased service. These plans called for extension of some trolley lines, abandonment of others and the taking in of more territory by buses.

Bus System Included in Utility Group

The Salem Gas Company of Salem, N. C., and the Carolina Coach Company, which operates interurban buses between Raleigh, Durham, Greensboro and other cities in the Piedmont district of North Carolina, are to be included in the Southern Cities Utilities Company system.

Buses in Almont-Imlay City Service

A. L. Drum, receiver of the Detroit United Railway and associated properties, has announced that service on the interurban line north of Romeo and running through Almont to Imlay City will be abandoned. Service will continue between Detroit and Romeo with five round trips daily. In lieu of the rail service to Almont and Imlay City, Mr. Drum, through the Wolverine Transit Company, one of the bus subsidiaries in receivership, will install coach operation out of Romeo, giving four round trips daily.

The abandonment of the Imlay City service, which has been operated under the corporate name of the Detroit, Almont & Northern Railway, makes the sixth rail abandonment since the receivership, the others being part of the Orchard Lake division, the Saline and Plymouth divisions of the Detroit, Jackson & Chicago Railway, the lower end of the Wyandotte & Trenton division, and part of the Detroit, Monroe & Toledo Short line.

Coach Service in Cincinnati at 25 Cents

The Cincinnati Street Railway, Cincinnati, Ohio, has started operation of "de luxe coach service" from Government Square to Reading and Paddack Roads. The buses will not operate on Sundays. On weekdays, except Saturday, buses will leave Paddack and Reading Roads at 8 and 8:45 a.m., arriving at Government Square at 8:20 and 9:05 a.m. In the afternoon buses will start from Government Square at 4:20, 5:05 and 5:50 p.m. The morning schedule on Saturdays will be the same as other days, but the afternoon schedule provides for a trip from Government Square at 12 noon and 12:45 p.m. There will be no late Saturday afternoon trips. The fare is 25 cents

Preparing for Substitution in Morristown

The Mayor and Board of Aldermen of Morristown, N. J., on July 6 granted a permit to the Morris County Traction Company to operate buses there instead of trolleys. Under the terms of the franchise the operation of buses is to begin 60 days from the date of the approval by the Public Utilities Commission of the municipal consents obtained by the company from the various municipalities between Maplewood and Lake Hopatcong, through which the buses are to run.

The local franchise provides that removal of the trolley tracks, wires and poles and other appurtenances from Speedwell Avenue and the restoration of that street to good condition must be completed within 60 days from the date of the beginning of the operation of buses. All of the expense of track removal, poles and wires and street re-

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pairing is to be borne by the railway. Another provision is that the tracks, poles and wires and appurtenances will be removed from the streets circling the public park and Morris Street within 60 days after demand from the Mayor and Aldermen. The bus fare is to be the same as the minimum charge imposed in like zones in other municipalities through which the buses will be operated.

Robert Schenck, who appeared for the company, explained that in the event that approval is granted by the Public Utilities Commission the next move will be to have the order of the commission sanctioned by the federal court.

Lines in Indiana Show Heavy Losses in 1926

Nearly one-third of all motor coach companies in Indiana were operated last year at a loss, it is revealed in a table made public recently by the State Public Service Commission. According to the commission's reckoning, which is based on annual reports of the bus companies, the aggregate operating deficit was $890,647. Total revenues of the 184 companies included in the table were $5,176,653 while total expenses, including depreciation charges were $6,067,300. Of the 55 companies showing deficits the greatest loss was in the case of the Shore Line Motor Coach Company, a subsidiary of the Gary Railways and the Chicago, South Shore & South Bend Railroad. This company reported a deficit of $222,837.

The second heaviest loser was the Indianapolis Street Railway bus system, with a deficit of $203,530, and the third was the Union Traction Company, with $138,865. Most successful from the standpoint of earnings was the Peoples Motor Coach Company, Indianapolis, which showed an income of $15,520.

Final Step in Bus Project Being Taken

The Springfield Street Railway, Springfield, Mass., is planning to operate a bus line between Worcester and Springfield. Six new buses will be used over a route which will follow closely the present railway. Final moves in the matter of obtaining licenses from all towns are being completed. Traveling time by bus will be 2½ hours, or about an hour less than that for the trip by railway between the two cities.

Would Demand Fee for Damages

Mayor Frank Doyle of East St. Louis, Ill., has declared war on interstate bus lines which operate through the city without paying any license fee to the municipality. He has instructed City Comptroller Jerre Kane to communicate with the various bus lines to ascertain whether they are willing to pay something toward repairing damage to the streets of East St. Louis caused by their buses. The United States Supreme Court has held that interstate bus lines are not subject to local taxation or license fees.

Co-ordination at Worcester

Railway in "heart of the commonwealth" creates faith and patronage by modernizing and safeguarding riders

THE Worcester Consolidated Street Railway, Worcester, Mass., serving the "Heart of the Commonwealth" by cars and buses, has completed a part of its rehabilitation plan and hopes to complete the rest of it certainly early next year. Just recently the company withdrew cars from non-paying interurban lines from Worcester to Worcester County points, among them the main line from Worcester to Fitchburg and the Blackstone Valley lines. In both these cases service is being rendered by the New England Transportation Company, a subsidiary of the New York, New Haven & Hartford Railroad.

Rearrangement of schedules, establishment of raised safety zones on all main streets, operation of company buses in districts not served by trolleys and feeding into main lines have quickened schedules, while the renovation of rolling stock and improvement of equipment in general, included in the first half of the rejuvenation plan, have resulted in ready response from the riding public. As part of the second half of its program the company has purchased 50 new cars.

Bus "competition" at Worcester has changed to bus "co-operation." Late to start, the Worcester Consolidated is leading in its field in co-operation. In recent years the character of the railway in Worcester has entirely changed. Prior to the year 1921 the maximum number of passengers was carried from May to September, inclusive. Beginning with the year 1921 the maximum number of passengers was carried from November to April. Between 1905 and 1910 there were very few automobiles, but since 1910 the registration of automobiles in Massachusetts has increased on an ascending scale. The increase was greatest in 1922 and 1923, in which years registration advanced about 116,000 vehicles. Not until 1923, however, did bus competition become serious. It is an old story with slight variations. Up to that time the buses were little more than trucks on which a passenger-carrying body had been placed. They went under the name of jitneys. Then came the bus that was a bus, and with it came real competition. The railway has met this competition by purchasing buses and now operates 38 of them. Service is given in various parts of the city of Worcester where the railway has been discontinued. Only three strictly city bus lines are operated and these are in parts of the city where no railway service has previously been given. An officer of the company said to the correspondent of the JOURNAL:

In our opinion the demand for buses is less this year than it was last. This is shown by the attitude of some of the towns in which we have abandoned railway service. Some of the towns have insisted that street cars be continued and have stated that they did not care to have the buses. However, the majority of the people still seem to desire bus transportation in the outlying districts, and for that reason buses have been substituted for some of the railway lines.

Railway Objects to Bus Project

A fight is being waged in Knoxville, Tenn., over the petition of the Rapid Transit Company for a franchise to operate buses over five routes in the city. The petition was presented to the City Council by the committee on June 20, and at a subsequent hearing H. G. Fowler, attorney of the Rapid Transit Company, said that the establishment of the five bus routes would, by opening up more satisfactory transportation lands now undeveloped, promote orderly growth and by this promotion increase the tax aggregate of the city so as greatly to relieve the pressing problem of municipal taxation. It is said the railway contends that if additional transportation is necessary it should have first opportunity to supply it because it has been the only common carrier in the city since the beginning of the transportation business.

Would Substitute Buses for Railway Service

The Danville Street Railway & Light Company has asked the Illinois Commerce Commission for permission to install buses on the Danville, Ill., Junction line to replace the electric cars. The Junction line was built by the late Uncle Joe Cannon and his brother, William P. Cannon, in 1882. Mules were the original motive power, but were replaced in 1891 by electricity. At the time it was built the Junction line was the longest in the city, but was never extended. The Danville company has been using buses to supplement street cars for about a year, but the move to stop the Junction line is the first effort to substitute buses for electric equipment.

Proposal to Be Renewed in Tarrytown

It is said that the next move in the controversy over the substitution of buses for the electric railway on the Tarrytown line will be made by the Third Avenue Railroad, New York, with a petition for a 20-cent fare to allow it to continue to operate trolleys. The petition will be presented to the Tarrytown Village Board, which recently denied the application for buses, principally on the objection that the purposed differential between the old fare on the railway and the fare suggested for the buses was too great.

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Financial *and* Corporate

Stock of Cleveland Railway Offered by Syndicate

A syndicate which included Hayden, Miller & Company, Otis & Company, Union Trust Company, Cleveland Trust Company and the Guardian Trust Company, all of Cleveland, offered $3,580,000 of capital stock of the Cleveland Railway for subscription recently at $102½ per share. This is a 6 per cent issue. The circular of the bankers describes briefly the franchise terms under which the railway operates. The present offering presumably is part of the program under which additional stock of the company was offered to current holders in the spring on the basis of the right to subscribe for one additional share for each ten shares then held. The plan was described in the ELECTRIC RAILWAY JOURNAL for April 23, 1927, at which time it was said that a syndicate would take such stock as was not subscribed by the present holders.

San Francisco-Sacramento Bonds Deposits to Be Kept Intact

Letters have been sent to bondholders of the San Francisco-Sacramento Railway by the Harris Trust & Savings Bank, E. H. Rollins & Sons and three associates advising that deposits of bonds made with the Wells Fargo Bank & Union Trust Company be kept intact until after the outcome of proposals for the purchase of the remainder of the stock of the line in the interests of the Western Pacific Railroad is seen. As explained at length in the ELECTRIC RAILWAY JOURNAL for July 9, page 80, January interest and sinking fund requirements were met on advances in behalf of the Western Pacific. The road in the first four months this year shows a deficit of $37,132, before interest, so that the July payment cannot be met without further assistance. It is indicated to bondholders that credit of the electric railway will be maintained if the stock purchase offer is met. If it is not, foreclosure probably will result immediately upon the expiration of 60 days of grace after any default of the July 1 payments.

Hocker Line to Cease Operations

The Kansas City, Lawrence & Topeka Electric Railroad (Hocker line), running from Kansas City to Zarah, Kan., through Merriam and Shawnee, will cease operations on July 31 and will be sold at public auction under an order granted recently by Judge John C. Pollock of the federal court in Kansas City, Kan. The date of the auction has not been set.

The order was at the request of Peter W. Goebel, receiver for the line and president of the Liberty National Bank. The receiver's petition requested the termination of the receivership and sale of the property as scrap.

The road, which is 12 miles long, has been in receivership since January, 1919. Judge Pollock's order ends proposals to sell the line to the Kansas City Public Service Company. Negotiations for such a sale were held early this year following a survey of the electric line by Fred G. Buffe, general manager of the Kansas City Public Service Company.

Patience Suggested

Holders of the first mortgage 5 per cent bonds of the Youngstown & Ohio River Railroad, Leetonia, Ohio, are being urged to exercise patience with respect to the interest due them on this issue. The hope is expressed that by Oct. 1 the situation will be clarified sufficiently to enable accurate judgment to be formed about the immediate future. It is suggested the bondholders take no action before that time. The opinion is expressed that it is not necessary at the present time, in the absence of litigation by individual bondholders, to form a bondholders' protective committee, call for deposits of bonds, or ask the appointment of a receiver. Coupons due on April 1, 1927, on this issue were not paid. There was a postponement until June 30, but even then the funds were not on hand to meet the interest due.

For many years the Youngstown & Ohio Railroad earned much more than its bond interest. It did this even during the war period, when most other railroads were going behind. For the past two years, however, earnings have been small, owing to the closing down of coal mines and the consequent depression of business in the territory served. The strike itself would not have injured the company seriously, but the train of events that followed it made things difficult for the railroad. The road is said now to be earning its operating expenses and taxes so that the physical value of the property is being maintained.

C. F. Denison, Boston, and Francis Ralston Welsh, Philadelphia, who recommend patience on the part of the bondholders, say that the management is extremely able. They and the trustees under the mortgage feel that the management can maintain and operate the property more economically and more advantageously than could probably be done under a receivership. The prospects are that during the next three to six months the coal situation will clear up, and the hope is expressed that the time is not far distant when the road will again earn its interest and cure its default.

Tacoma Statistics Revealed

Average fare being paid by revenue passengers of the Tacoma Railway & Power Company, Tacoma, Wash., under the present tariff, including the 30-cent weekly ticket with 5-cent additional fare, is 1.21 cents higher than it was in 1926, when the $1.25 weekly pass was sold. This is based on a comparison of financial figures for May compared with the corresponding month of last year. The average revenue passenger fare last month was 7.46 cents, as against 6.25 cents for May, 1926. The average fare for all passengers, including transfer passengers, free riders and all kinds, was 5.42 cents for last month, against 5.12 cents for the similar month of last year.

In submitting his report, Richard T. Sullivan, manager, commented that the company concurred in the opinion of Kenneth G. Harlan, city utilities expert, that the present fares ought to be left unchanged pending the company's reply to the Harlan report. This document is due before Aug. 14, unless the City Council could suggest a fare which would produce more net revenue, as the net still is insufficient to pay a proper return.

The Council replied that it agreed to leaving the fare unchanged pending the company reply in writing, but disagreed with all other parts of the company statement. The Council was advised by Mr. Harlan that he cannot concede the company's figures as correct as there are items of expense in dispute. According to him the deficit of $181,716 claimed for the eleven months under the terms of the agreement for experimental operations would be about offset by the expenses which he regards as unwarranted charges.

The total number of passengers carried last month was 2,045,568, compared with 1,998,975 passengers in May, 1926, but the revenue passenger total of 1,485,720 was less than the figure of 1,637,783 for the corresponding month of 1926.

According to company figures net revenue in May after deduction of taxes was $6,097, or $15,569 less than the city and company agreed upon as a minimum return.

Committees Approve Indiana Merger

All committees of security holders have approved the plan for consolidating the Central Indiana Power Company and subsidiaries and the Terre Haute, Indianapolis & Eastern Traction Company and certain of its subsidiaries. The new company will be called the Indiana Electric Corporation, which is the name of an operating subsidiary of the Central Indiana Power Company, which latter is the chief subsidiary of the American Public Utilities Company, an Insull organization. As a preliminary to consolidation, Central Indiana Power will acquire all assets of five of its subsidiaries, canceling all their obligations not publicly held and

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assuming those publicly held to the amount of $2,015,350 as underlying divisional bonds. The plan is subject to approval by the Indiana Public Service Commission. It was reviewed in the JOURNAL for June 25, page 1156.

Receiver Appointed for Indiana Road

Federal Judge T. W. Slick has appointed R. R. Smith, vice-president and general manager of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., receiver of the company. The petition was filed by the Westinghouse Electric & Manufacturing Company, which claims an unpaid account of $3,177.45. The line operates between Michigan City and Goshen, and maintains city service in South Bend, Laporte, Michigan City, Mishawaka, Elkhart and Goshen. More than 120 miles of line is involved, 47 miles of which is in paved streets. Mr. Smith said:

Since the advent of the automobile, but more particularly since the beginning of the World War in 1914, the electric railway industry has been faced with some very serious financial problems. The increasing cost of labor which came with the World War made our problem an exceedingly difficult one. In addition to the increase in costs the continuously growing competition of privately owned automobiles has made some such step as we have just been forced into almost inevitable.

Our company has battled for a number of years, endeavoring to give good service to the public which it serves and endeavoring to keep pace with transportation necessities of our growing city. When the Westinghouse company saw fit to bring this action we decided it was inevitable and therefore did not contest. Under this receivership the lines will continue to operate and in the end I hope I may be able to work out the problem so that the communities we serve will get even better service than in the past.

Steam Roads Reported After Washington-Baltimore Electric

Reports have been revived that the steam railroads are after the Washington, Baltimore & Annapolis Railroad. As the electric railroad parallels the Baltimore & Ohio from Washington to Baltimore, it is thought in some quarters that the electric line will finally come into the hands of the B. & O. with the Pennsylvania as a competitor.

Control of the electric railway was acquired recently by the Consolidated Gas, Electric Light & Power Company of Baltimore through the acquisition of 32,429 shares of common and 19,148 shares of preferred stock of the electric line. These holdings are to be vested with an organization known as the Baltimore Corporation of Maryland, according to a petition now before the Maryland Public Service Commission. Utility men believe that Consolidated is not desirous of entering the rapid transit business and that it bought the electric railway to acquire the Annapolis & Chesapeake Bay Power Company, a subsidiary of the electric railroad.

Increase in Traffic on Lines of Chicago, Aurora & Elgin

The operating revenue of the Chicago, Aurora & Elgin Railroad, Chicago, Ill., for the year ended Dec. 31, 1926, not including non-operating income of $179,321, was $2,807,574, an increase of $99,957, notwithstanding the fact that the 1925 figures included revenue from the sale of power to various customers, for a full twelve months period, while the revenue for the past year includes these power sales for only two months of the year. The total revenue from transportation for 1926 was $2,469,371. This was an increase of $183,653 over 1925. The net income for the year 1926 was $93,122. These figures were included in the annual report of the corporation, which includes statistics of the railroad. Operating expenses were $2,405,483, an increase of $293,053. This increase in expenses is the result of the substantially improved standard of service. The improved service embraces not only more adequate facilities for the convenience and comfort of passengers, but also the operation of additional crossing protection, block signal circuits and other safety devices for the protection of the public in general as well as employees of the company.

INCOME STATEMENT OF THE CHICAGO, AURORA & ELGIN RAILROAD
(For the year ended Dec. 31, 1926)

Transportation operating revenue		$2,469,371
Other railway operations		338,202
		$2,807,574
Operating expenses:		
Way and structures	$224,693	
Equipment	197,246	
Power	538,902	
Conducting transportation	770,653	
Traffic	70,611	
General and miscellaneous	603,375	
		2,405,483
Net revenue from railway operations		$402,090
Net loss from auxiliary operations	$4,705	
Taxes	120,328	
		125,033
Operating income		$277,057
Non-operating income		179,321
Gross income		$456,378
Interest on funded debt	$327,340	
Other deductions		35,916
Deductions from gross income		363,256
Net income		$93,122

SURPLUS ACCOUNT

Balance Jan. 1, 1926		$871,373
Surplus brought over from Chicago, Westchester & Western Railroad	$108,865	
Less: Sundry adjustments—Chicago, Aurora & Elgin Railroad	91,961	
		16,903
		$888,276
Net income for year ended Dec. 31, 1926	$93,122	
Dividends paid on prior lien preferred stock	30,524	
		62,597
Surplus, Dec. 31, 1926		$950,874

INCOME ACCOUNT

	1926	1925	1924
Income:			
Interest on bank deposits	$2,051	$484	$645
Interest on securities owned	10,960	.....	.....
Total income	$13,012	$484	$645
Expenses:			
Miscellaneous expenses	10,219	4,938	3,086
Net earnings	$2,792	*$4,453	*$2,440
Accrued interest on debenture bonds	360,000	360,000	270,000
Deficit	$357,207	$346,453	$272,440

*Deficit.

	Revenue Passengers Carried	Car-Miles Operated	Total Tons Freight Handled
1922	5,141,271	4,035,311	141,831
1923	5,665,978	4,344,500	346,570
1924	6,148,302	4,556,105	396,573
1925	6,638,054	4,558,176	580,821
1926	6,997,793	4,869,947	638,249

An order was placed, the report states, for fifteen new passenger cars at an approximate cost of $562,000, for delivery about July 1, 1927. The purchase of these cars will be financed under the Philadelphia car trust plan. Each car will seat 52 passengers and will be equipped with the new bucket type seats which have been found to be so comfortable and satisfactory on de luxe motor coaches. They will have separate smoking compartments, complete toilet facilities and will be equipped with four 150-hp. motors. Particular attention has also been paid to car illumination and ventilation and to the necessary safety features. The cars when complete will weigh 102,000 lb.

For the purpose of protecting its territory from motor coach competition, the company has, through its subsidiary, the Western Motor Coach Company, filed an application with the Illinois Commerce Commission for certificates of convenience and necessity to operate over the main highways adjacent to the railroad. When the certficates are granted the company will operate a superior motor coach service which will connect with the railroad at various convenient points and which will prove of substantial benefit to the communities it will serve and thus assist in the development of the territory.

The territory served by the transportation system of the company lies between the city of Chicago and the Fox River Valley, approximately 40 miles distant. It is apparent that the company serves a widely diversified territory, the principal activities of which are closely linked with Chicago. In the purely suburban residential territory between Wheaton and Maywood there is a total population of 25,000 people adjacent to the company's lines.

Hudson Valley Would Abandon Lines

The Hudson Valley Railway, Glens Falls, N. Y., has petitioned the Public Service Commission for the approval of the abandonment of the following portions of its route: Fort Edward to Thomson line, Northumberland to Stillwater line, South and Knight Street line in Glens Falls, the Depot line in Glens Falls and the Belt line in Glens Falls. The petition contends that these portions of its lines sought to be abandoned are no longer necessary for the successful operation of the road and that company intends to substitute bus service for railway service.

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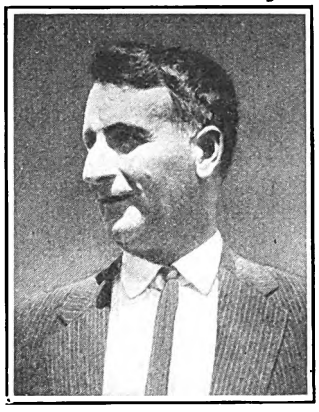
Personal Items

C. R. McMahon Goes to Oakland

C. R. McMahon, formerly superintendent of equipment of the Des Moines City Railway, Des Moines, Iowa, has been appointed assistant superintendent of equipment of the Key System Transit Company, Oakland, Cal. He assumed his new duties on July 1 at the Emeryville shops.

Mr. McMahon has had a long career in railroading, beginning with the Beaver Valley Traction Company in Pennsylvania. Here he went after leaving school in his native city of Beaver, Pa. He left this road in 1906 to take the position of carhouse foreman with the Virginia Railway & Power Company at Norfolk, Va., where he remained two years. In 1908 he became general foreman of the Utah Light & Traction Company in Salt Lake City. There he stayed for ten years, going in 1918 to the Des Moines City Railway.



C. R. McMahon

Mr. McMahon's immediate superior in his new work is W. P. Jackson. Both he and Mr. Jackson are under H. P. Bell, chief engineer of the Key System Transit Company.

Elections in Louisville

A. J. Brewer, former newspaper man, statistician for the Louisville Railway, Louisville, Ky., for the last four years, was elected acting secretary of the company at a meeting of its board of directors recently. Mr. Brewer takes over a portion of the duties of the late Samuel Gill Boyle, secretary-treasurer.

The directorate confirmed the appointment of Mrs. A. L. Humphrey as assistant treasurer.

R. G. Winans with Columbia Gas

R. G. Winans, for nearly two years field supervisor with the General Engineering & Management Corporation, resigned that position on July 1 to become affiliated with the Columbia Engineering & Management Corporation, a subsidiary of the Columbia Gas & Electric Corporation.

After he was graduated from Pratt Institute, Brooklyn, where he studied industrial electrical engineering in the School of Science and Engineering, Mr. Winans was employed in the switchboard and central station construction departments of the General Electric Company. He was afterward employed by the Schenectady Railway, but resigned as engineer of power and equipment to accept a position as assistant engineer with the New York State Public Service Commission, in which capacity he continued for ten years.

At the present time he is a member of the American Electric Railway Association and is serving on the committee of power generation and conversion of that association. In addition he is a member of the National Electric Light Association.

In his new position Mr. Winans will devote himself to the work of valuation and structure of rates as well as to matters pertaining to various states' public service commissions.

C. V. Wood, Jr., Leaves Providence—Other Changes

Clark V. Wood, Jr., has resigned as superintendent of the bus division of the United Electric Railways, Providence, R. I. Following Mr. Woods' retirement it was announced that Edward Dutton, transportation foreman of the bus division, would report to R. R. Anderson, superintendent of transportation, and that Harry Jardine, assistant superintendent of the bus division, had been appointed supervisor of bus equipment, reporting to Henry S. Day, superintendent of equipment.

The effect of these changes is to consolidate railway and bus operations under Superintendent of Transportation R. R. Anderson, and to consolidate maintenance of electric railway and automotive equipment under Superintendent of Equipment Henry S. Day.

Mr. Wood was called into the garage just before he left the company and found his men gathered there, to remind him that his going away was not to be passed over lightly. Before he could ask what it was all about E. S. Dutton stepped forward and presented to him a beautiful green gold Hamilton wrist watch, with a picture of a bus on the back and inscribed with the following words, "C. V. Wood, Jr., from the U. E. R. Bus Division Employees in Recognition of Our Pleasant Relations." Then Chief Inspector Huntoon stepped forward and presented to him a box of cigars, a humidor and a ten dollar gold piece. With the latter was a note which read: "Not to be spent until you are broke—hope you never will be."

E. L. Lockman Promoted at Boston

E. L. Lockman, of the maintenance department of the Boston Elevated Railway, Boston, Mass., has been promoted to be assistant to the superintendent of maintenance, H. M. Steward. This advancement comes as a logical step in Mr. Lockwood's railway career of 29 years, beginning with the Union Switch & Signal Company, by which he was employed on the signal and interlocking installation at the Boston South Terminal station. This led to a job in the New Haven's signal department, but in March, 1901, he was called back by the Union Switch & Signal Company to assist on the construction of signals and interlocking on the original elevated or rapid transit lines from Sullivan Square to Dudley Street in Boston.

When the elevated was opened on June 10, 1901, Mr. Lockman joined its staff as signal maintainer, becoming, in 1905, first signal foreman, then general foreman, signal division. As such he had charge of signal and interlocking construction in the Cambridge subway, from Harvard Square to Park Street.

E. L. Lockman

After nearly eleven years in the signal division Mr. Lockman spent nearly nine years as assistant roadmaster, rapid transit lines, and then until June 1, 1927, was assistant engineer of surface lines, when promoted to his new position.

Mr. Lockman is active in the research work of the American Electric Railway Engineering Association, on the committees on rail corrugation and on welding wire and specifications. He is a graduate in civil engineering of Northeastern University evening school of civil engineering and a member of the Boston Society of Civil Engineers, the New England Railroad Club and the New England Street Railway Club.

E. W. Brown Made Chief Engineer of Kentucky Utility

Edward W. Brown has been appointed chief engineer of the Kentucky Utilities Company and its subsidiaries, among them the electric, gas and railway services in Paducah. He succeeds George

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T. Bogard, who became a vice-president and chief of operations March 15, last. Mr. Brown was born at Cobden, Ill., received his high school training at Metropolis, Ill., was graduated from the College of Engineering at the University of Illinois in 1910 and took special work at the Massachusetts Institute of Technology. After his collegiate career closed, Mr. Brown was employed successively by the Westinghouse Electric & Manufacturing Company, the General Electric Company and the Central Illinois Public Service Company. He joined the Kentucky Utilities Company in September, 1917, was plant superintendent at Pocket, Va., until 1920, later superintendent of operations, then district engineer.

W. A. Jones Made Doherty Vice-President

William Alton Jones, for the last two years chairman of the executive committee of Henry L. Doherty & Company, New York, has been elected first vice-president of Cities Service Company.

Mr. Jones has been with the Cities Service organization since 1912. Until he came to New York in 1921 he was at Joplin, Mo., where he served as treasurer of the Empire District Electric Company and associated companies. Mr. Jones is an officer or director of some fifty companies.

Changes on Central Division of New Jersey Road

Announcement has been made of the following changes in the Central Division of the Public Service Railway, Newark, N. J.:

D. W. Baird appointed supervisor at Elizabeth carhouse. Mr. Baird was supervisor at New Brunswick carhouse.

Patrick Creamer to be supervisor at New Brunswick carhouse. Mr. Creamer was supervisor at Perth Amboy carhouse. He will have supervision of Public Service Railroad cars west of Bonhamtown Junction.

Albert Carnot appointed supervisor at Perth Amboy carhouse. Mr. Carnot will continue to have supervision of Public Service Railroad cars east of Bonhamtown Junction.

Andrew Heuther, supervisor at Elizabeth carhouse, has been assigned to other duties.

W. B. Huffer Made General Traffic Manager

W. B. Huffer, for the last three years public relations representative of the Indianapolis, Columbus & Eastern Traction Company, Columbus, Ohio, will become general traffic manager of the company's lines, succeeding Arthur V. Bland, resigned. Mr. Huffer will have his headquarters in the Interurban building in Springfield, Ohio. He will be in charge of all matters pertaining to both passenger and freight traffic as well as over the public relations offices which will be moved to Springfield.

Messrs. Ellicott and Beck Advance

Westinghouse Brake makes one vice-president and other general sales manager

IMPORTANT changes in personnel are announced by the Westinghouse Air Brake Company. They concern Charles R. Ellicott and Carl H. Beck, both well known in the electric railway

C. R. Ellicott

industry. Mr. Ellicott, Eastern manager of the company, has been elected resident vice-president with headquarters at New York. Mr. Beck, for seven years assistant Eastern manager at New York, has been appointed general sales manager with headquarters at Wilmerding.

Mr. Ellicott entered the employ of the Westinghouse Air Brake Company in August, 1902, as a special apprentice in the Wilmerding shops, and was later made mechanical expert at New York. From 1905 until 1912 he served as representative of the company, first in New York and then in Boston. He was appointed assistant Eastern manager in

C. H. Beck

1912 and promoted to the position of Eastern manager in 1920. He was born in Chicago, where he received his early education. In 1902 he was graduated as a Bachelor of Science from the Sheffield Scientific School at Yale University. Mr. Ellicott has always taken a prominent part in the affairs of the American Electric Railway Association, serving for many years as a member of the executive committee.

Mr. Beck entered the employ of the Westinghouse Air Brake Company as a special apprentice in 1905, and after filling shop and field assignments he was transferred to the St. Louis office in 1907, as steam road inspector. In 1909 he was advanced to the position of representative of the Westinghouse Traction Brake Company in the same city. This position he held until 1919, when he was made special representative of the Safety Car Devices Company at Wilmerding.

Mr. Beck's next promotion came in 1920, when he was made assistant Eastern manager of the Westinghouse Air Brake Company, a position he held until his new appointment on July 1. He was graduated from the Pennsylvania State College in 1905 as a Bachelor of Science and in 1911 received his M. E. degree from the same college. Mr. Beck has always taken a lively interest in all matters that pertain to the welfare of the electric railway industry. He was particularly active in promoting the introduction of the safety car.

OBITUARY

Wilmot Kirk Morley

Wilmot Kirk Morley, president of the Grand Rapids, Grand Haven & Muskegon Railway, died at his home in Grand Rapids, Mich., on July 13. Mr. Morley, who had spent his entire lifetime in railroad work, both steam and electric, was prominently known in the industry.

Mr. Morley started his career when thirteen years old in 1867, entering the service of the Chicago & Alton Railroad as station agent and operator at various stations. Later he was advanced to dispatcher at Bloomington, Ill., chief train dispatcher and finally superintendent of telegraph. In 1888 and until 1894 he filled the position of superintendent of the St. Louis & Kansas City division of the Chicago & Alton Railroad. Mr. Morley then removed to Grand Rapids to enter the electric railway industry, later becoming vice-president and general manager of the Grand Rapids, Grand Haven & Muskegon Railway. In this capacity he continued from 1903 until 1920. During the next two years he was succeeded by Sidney L. Vaughan, present manager under the receivership.

The association of Mr. Vaughan and Mr. Morley was cemented in 1925 when they took over the Grand Rapids, Grand Haven & Muskegon Railway from the owners in an effort to rehabilitate that property. Even though they succeeded only partially in achieving their hopes as interurban promoters they will always be regarded as pioneers in this phase of railway development, with which their names are inseparably connected.

Mr. Morley was born on Nov. 15, 1854, in Youngstown, Ohio.

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Manufactures and the Markets

Super-Car Exhibit Predicted for October Convention

All indications at the headquarters of the exhibit committee of the American Electric Railway Association point to a super-car exhibit for the annual convention next October. Since the announcement of space assignments made in the JOURNAL of July 9, the following companies have indicated that they will contribute exhibits of unusual interest to the outdoor section. J. G. Brill Company's exhibit will include one city and one interurban car. The Differential Steel Car Company will present an electric dump car, electric locomotive crane car, concrete breaker and a three-way motor truck body.

Cincinnati, Hamilton & Dayton Railway has announced its intention of exhibiting five electric railway cars, two interurban cars, and one city type car, also two freight cars. The Cummings Car & Coach Company will have on the tracks two electric railway cars and one gas-electric drive snow sweeper. The St. Louis Car Company plans an interesting exhibit of electric railway cars and trucks. United Railways & Electric Company will display one articulated car and the Westinghouse Electric & Manufacturing Company will feature a 50-ton electric locomotive.

A highly interesting feature of this section of the exhibits will be one of the high-speed interurban electric articulated cars presented by the Washington, Baltimore & Annapolis Electric Railway. These units were recently placed in service and were fully described in the JOURNAL.

More-Jones Now Part of National Bearing Metals

The More-Jones Brass & Metal Company, established in 1874, incorporated in 1899, has reorganized, and is now a division of the National Bearing Metals Corporation, recently incorporated, with general offices at 4930 Manchester Avenue, St. Louis, Mo.

The following firms are also divisions of the National Bearing Metals Corporation: Bronze Metal Company, Meadville, Pa.; Bronze Metal Company, Jersey City, N. J.; Damascus Bronze Company, Pittsburgh, Pa.; Keystone Bronze Company, Pittsburgh, Pa., and Southern Brass Company, Norfolk, Va.

The new company will assume all contracts and obligations of these firms.

The More-Jones Brass & Metal Company will be called "More-Jones Brass & Metal Company Division" of the "National Bearing Metals Corporation," with main offices in St. Louis, Mo. In this connection the company is advising its customers that the facilities for serving them will remain the same—the same unexcelled products—the same prompt service—the same sales, office and foundry personnel. In the future all correspondence and orders intended for the More-Jones Brass & Metal Company should be addressed to the National Bearing Metals Corporation, More-Jones Brass & Metal Company Division, at the address in St. Louis given previously.

Flook Heads Brown Boveri

William M. Flook was elected July 6 chairman of the board of the American Brown Boveri Electric Corporation. Laurence R. Wilder, formerly president of the corporation, has become chairman of the advisory committee of the ship building division of the business.

Ten Cars and Four Buses for San Francisco Municipal Railway

The supervisors of San Francisco, Cal., have voted for ten new cars for use on the Judah Street and Duboce Tunnel lines. The $192,000 appropriated for the new municipal railway cars is to come out of the old depreciation reserve. There was a sharp debate over the $19,200 price per car, two supervisors claiming that the price was $6,500 more than was paid by the privately operated company run under similar conditions of service. In this connection Assistant City Engineer Nelson D. Eckert explained that the cars purchased by the Municipal Railway are the best in California and have a low depreciation because of their sturdy construction. Mr. Eckert declared that the cars bought by the municipality are noted for their long life, their low maintenance cost and their exceedingly high safety factor. An appropriation of $31,807 from the Municipal Railway reserve depreciation fund also was voted for the purchase of four buses to replace four of the original five purchased in 1923. The old buses have traveled more than 300,000 miles each.

Trolley Supply Company Sells Business to Ohio Brass

The Trolley Supply Company, Massillon, Ohio, has sold its electric railway business to the Ohio Brass Company. In the last year or so it has become engaged in the manufacture of a product entirely foreign to the street railway market and this now demands its entire manufacturing facilities.

The Ideal trolley catcher and the Knutson trolley retriever, heretofore manufactured by the Trolley Supply Company, will now be made and sold by the Ohio Brass Company. Repair parts for Simplex trolley bases may also be obtained from the latter company.

C. F. Elmes Engineering Consultant in Chicago

Cecil F. Elmes, whose testimony in the famous Indianapolis Water case largely resulted in wide recognition of the establishment of the method of depreciating the physical properties of public utilities, has announced his resignation as Western manager for Sanderson & Porter and the opening of his own engineering offices as the Cecil F. Elmes Organization in the Illinois Merchants Bank Building, Chicago. Mr. Elmes was with Sanderson & Porter for nearly twenty years and for the last nine years was in charge of the Chicago offices.

In his new business Mr. Elmes will not only buy, build and manage utility groups but will take an active part in the development of gas, electric and hydro-power industries. He recently completed a merger which resulted in the establishment of the Great Lakes Utility Company, with subsidiaries in Ohio, Michigan, Indiana and New York.

He is known as the author of "Appraisals and Rate Making," "Price Levels in Relation to Value" and a number of other works on public utilities.

General Electric Reports Business Good

Orders received by the General Electric Company for the three months ended June 30 amounted to $78,105,247, compared with $78,972,062 for the second quarter of 1926, a decrease of 1 per cent. For the six months ended June 30 orders totaled $155,655,828, representing a decrease of 6 per cent compared with $165,405,720 in the corresponding six months of 1926.

Changes in Westinghouse Brake Representatives

Westinghouse Air Brake Company, Pittsburgh, Pa., announces the appointment of E. W. Davis, representative of the company at Boston, Mass., to Southwestern manager, with headquarters at St. Louis, Mo. Raymond Boiselle, representative in the Pittsburgh district, has been transferred as representative to Boston, Mass., to succeed Mr. Davis.

Mr. Davis was graduated from Purdue University, Lafayette, Ind., with the mechanical engineering class. He served for several years with the Atchison, Topeka & Santa Fé, the Chicago, Burlington & Quincy and a number of industrial organizations, including the Westinghouse Automatic Steam Coupler Company. He entered the employ of the Westinghouse Air Brake Company in 1908 as inspector, and later served as assistant district engineer at New York. In 1919 he was appointed representative of the Westinghouse Traction Brake Company at the same place, and since 1922 served as representative at Boston.

Mr. Boiselle received his mechanical engineering education at the University of Illinois. He served on the Missouri

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Pacific, the Atchison, Topeka & Santa Fé and the Chicago, Rock Island & Pacific. Entering the service of the Westinghouse Air Brake Company in 1912, he was employed in the test department until 1917. During the World War he served as first lieutenant and captain, Aerial Armament Division, overseas, returning to the Westinghouse service as mechanical expert in the Southwestern district, where he remained until 1923, since which time he has been representative in the Pittsburgh district.

Market for Copper, Zinc and Tin More Active

COPPER and zinc sold in larger volume in the week ended July 13 than for some time, with prices for each of these metals somewhat improved. Lead has been steady since the price declined July 1 and a fair amount of business has been done. Prices for prompt tin have declined a little further and dealers have lent more than the accustomed activity to the market. Silver is virtually unchanged.

Copper was still available on July 7 at 12⅛ cents, delivered at Connecticut points, and a good tonnage was sold, though there was a general tendency to mark prices up to 12⅜ cents, and some business was even done at the level. All of the 12½-cent copper had disappeared on July 8, 12⅜ cents being uniformly asked for Eastern deliveries and 12¾ cents in the Middle West. Business continued very satisfactory to and including July 11, but on July 12 and 13 demand moderated perceptibly, most sellers continuing to quote 12⅜ cents, delivered, but scattering sales of small lots were made at slight concessions, ranging from 12.55 to 12.60 cents, also.

Galvanizers were active buyers of zinc during the week ended July 13, the total sales for the week being the largest since early January. Most of the business has been done at 6.15 cents. Spot lots of high-grade continue nominal at 8 cents delivered in the East.

Buying of lead during the week has been fully up to the average in volume. The weakness in London, which threatened to divert Mexican ore lead to the domestic market, caused the American Smelting & Refining Company to cut its official contract price for New York delivery from 6.30 cents to 6.20 cents on July 7. On the same day the leading interest in the West reduced its price to regular customers from 6 cents to 5.95 cents. Storage battery manufacturers are showing more interest in the market, as are makers of ammunition and blue-lead products. Not since the summer of 1923, when New York lead for ten days sagged to 6 cents, has the metal been as low as at present. Of course if London continues to decline and domestic producers persist in excluding ore lead the price here may go still lower. Sentiment in the tin market is that prices should ease somewhat.

ELECTRIC RAILWAY MATERIAL PRICES—JULY 12, 1927

Metals—New York

Copper, electrolytic, cents per lb	12.36
Lead, cents per lb	6.20
Nickel, cents per lb	35.00
Zinc, cents per lb	6.53
Tin, Straits, cents per lb	63.625
Aluminum, 98 or 99 per cent, cents per lb	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.425
Somerset mine run, Boston	1.775
Pittsburgh mine run, Pittsburgh	2.02
Franklin, Ill., screenings, Chicago	‡
Central, Ill., screenings, Chicago	‡
Kansas screenings, Kansas City	2.675

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅜ in. and larger, cents per lb	2.85
Tie plates (flat type), cents per lb	2.35
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.80
Ties, white oak, Chicago, 6 in.x8 in.x8 ft	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb	3.00
Sheet iron, galvanized (24 gage), cents per lb	3.85
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	2.40

Waste—New York

Waste, wool, cents per lb	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12–17.50
Colored	7-14

‡ Quotations withdrawn because of strike.

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	11.0
White lead in oil (100 lb. keg), cents per lb	14.0
Turpentine (bbl. lots), per gal	$0.60
Putty, 100 lb. tins, cents per lb	5.25–5.50

Wire—New York

Copper wire, cents per lb	14.25
Rubber-covered wire, No. 14, per 1,000 ft.	$5.15–$5.20
Weatherproof wire base, cents per lb	16.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.94
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y	1.75
Sand, cu.yd., f.o.b. N. Y	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb	10.625
Light copper, cents per lb	9.00
Heavy yellow brass, cents per lb	7.00
Zinc, old scrap, cents per lb	3.875
Lead, cents per lb. (heavy)	5.25
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	15.25
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.25

Ten Units Ordered by Chicago, North Shore & Milwaukee

Promised for delivery on Nov. 1, the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has just placed an order for ten one-man, two-man, city type cars. The unit will be of all steel construction and weigh approximately 40,000 lb. Two of them will be equipped with Timken roller bearings. Subjoined are specifications as announced by Glenn H. Brittain, assistant engineer car equipment of the operating company.

Name of railway	Chicago, North Shore & Milwaukee Railroad
City and state	Chicago, Ill.
Number of units	10
Type of unit	One-man, two-man, motor, passenger, city, double end, double truck
Number of seats	56
Builder of car body	St. Louis Car Company
Date of delivery	Nov. 1
Weight, total, approximately	40,000 lb.
Bolster centers	28 ft. 0 in.
Length over all	51 ft. 0 in.
Length over body posts	37 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 7/8 in.
Height, rail to trolley base	11 ft. 9½ in.
Window post spacing	30 in.
Body	All steel
Roof	Arch
Air brakes	Westinghouse Traction Brake Company
Armature bearings	Plain
Axles	Standard Steel
Car signal system	Faraday high voltage
Compressors	Westinghouse DH-16
Conduit	Metal
Control	General Electric K-35-KK
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	End, folding, with treadle control
Energy saving device	Economy meter
Fare boxes	Johnson
Finish	Duco
Gears and pinions	General Electric Grade M
Glass	Plate
Hand brakes	Peacock and St. Louis
Hand straps	Rico
Heat insulating material	Cork
Heaters	Railway Utility
Headlights	Golden Glow SM-95
Headlining	Haskelite
Interior trim	Mahogany
Journal bearings	Eight cars plain, two cars Timken roller
Journal boxes	St. Louis
Lamp fixtures	Adams & Westlake
Motors	Four General Electric, inside hung
Registers	Tuttle and Bailey
Roof material	Canvas
Safety car devices	Complete equipment
Sash fixtures	O. M. Edwards
Seats	Hale-Kilburn No. 300
Seat spacing	2 ft. 6 in.
Seating material	L. C. Chase, grade C
Slack adjusters	Smith-Ward shim
Steps	Folding
Trolley catchers	Knutson No. 5
Trolley base	U. S. 20-C
Trolley wheels	More-Jones
Trucks	St. Louis
Ventilators	Railway Utility
Wheels, type	Rolled steel, 26 in.
Wheelguards	H-B life guards

More Oxygen and Acetylene Plants for Air Reduction

The Air Reduction Company, Inc., New York, has purchased the business, in so far as the manufacture and sale of oxygen, acetylene and kindred products are concerned, of the United Gas Improvement Contracting Company, a subsidiary of the United Gas Improvement Company, and the United Oxygen Company, Philadelphia. The purchase includes oxygen plants at Philadelphia, Chester, Milton, Enola, and Reading, Pa., and an acetylene plant at Bridgeport, Pa. Thus, the Air Reduction Sales Company, the sales organization of Air Reduction Company, Inc., has acquired through this purchase the production and distribution facilities of five

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additional oxygen plants and one acetylene plant in the industrial district of eastern Pennsylvania. The company now operates 34 oxygen plants and nineteen acetylene plants, all located in or near principal industrial centers of the United States.

ROLLING STOCK

BOSTON ELEVATED RAILWAY, Boston, Mass., is reported to have ordered four air-dump cars from the Differential Steel Car Company, Findlay, Ohio. It has just accepted delivery of the second Mack gas-electric drive bus. This bus is a 29-passenger, four-cylinder model, having a single electric motor driving through a single drive shaft.

TWIN CITY RAPID TRANSIT COMPANY, St. Paul, Minn., has accepted delivery on six 230-in. wheelbase Mack bus chassis on which bodies will be built locally. This is the third repeat order, totaling thirteen Macks delivered to this company this year. Twin City now operates a fleet of 48 Macks.

SPRINGFIELD STREET RAILWAY, Springfield, Mass., has accepted delivery of its initial order of Mack buses. Included are six 29-passenger city type buses, four-cylinder model, 225-in. wheelbase. Twenty-four buses of various makes have been in operation for some time. The Macks will operate on the Orchard line and the Pine Point line, both suburban routes.

IOWA SOUTHERN UTILITIES, Centerville, Iowa, operating the Burlington Street Railway and the Ottumwa Street Railway, has accepted delivery on four 25-passenger Mack city type buses, four-cylinder model, 196-in. wheelbase, making a total of nineteen Macks which have been put in operation by these railways.

PUBLIC SERVICE TRANSPORTATION COMPANY, Newark, N. J., bus operating subsidiary of the Public Service Corporation, has received 23 Mack buses, completing one section of its order for 147 buses. The buses just delivered are 29-passenger city type, six-cylinder models, 233-in. wheelbase chassis. Forty buses of this type are now being operated.

TRACK AND LINE

THE WORCESTER CONSOLIDATED STREET RAILWAY, Worcester, Mass., announces the reconstruction of 3,100 ft. of track on June Street, Worcester, at an approximate cost of $20,000 as completed. This job required 95 tons rail, 1,544 ties, 20 kegs spikes, 105 joints, 630 track bolts, 105 bonds, 3,088 tie plates and 450 tie rods. Reconstruction of double track on Park Avenue, in the same city, has been completed at a cost of nearly $75,000 and a new branch-off is announced at Park Avenue and Maywood Street, at a cost of $3,000. This is in line with the company's plans for 1927, which included the purchase of cars.

PHILADELPHIA, PA. — The city of Philadelphia has awarded the Pierce Electric Company, Chicago, Ill., the contract for the third rail and bonding of the Broad Street subway, Philadelphia. The contract price is $132,200. The Pierce Electric Company is the same company that executed the electrical contract for the Illinois Central Railroad.

LOS ANGELES RAILWAY, Los Angeles, Cal., has under way two jobs of complete reconstruction of tracks. The first one is on the east side of the Southern Pacific tracks on Alameda at Vernon, and the second is on 53d Street between Main and San Pedro Streets. The old light rail formerly used is being replaced with 116-lb. girder rail.

SHOPS AND BUILDINGS

LOS ANGELES RAILWAY, Los Angeles, Cal., has just completed a new bus inspection and repair shop for its bus division which is reported as the last word in mechanical equipment for the inspection and repair of its fast growing bus fleet. The building is 100 ft. wide and 310 ft. long. It is of brick, steel and concrete construction and is equipped with the "wet pipe" automatic sprinkler system. A comprehensive study was made by the engineers of the company of the lighting and ventilating of the building, with a view to facilitating the work by providing the best working conditions for the mechanics. There are three bays to the building and three roofs arranged in sawtooth fashion, each sawtooth being equipped with skylights running the entire length of the building.

TRADE NOTES

S. E. CONYBEARE, advertising manager of the Armstrong Cork Company, Lancaster, Pa., and president of the Association of National Advertisers, has been elected a member of the board of directors of the Audit Bureau of Circulations. He will fill out the unexpired term of B. H. Bramble.

ROLLER-SMITH COMPANY, New York City, announces the following additions to its sales organization: William H. Neville, Age-Herald Building, Birmingham, Ala.; Atkinson Equipment Company, Atlanta Trust Company Building, Atlanta, Ga. Mr. Neville will cover the state of Alabama and the Atkinson Equipment Company will handle the company's business in Georgia.

LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO, announces the following changes and additions to its sales and service department. L. P. Henderson, formerly connected with the Detroit office, has been transferred to Chicago in charge of welder service; J. E. Durstine has been transferred from the experimental engineering department to welder service department at Cleveland. J. W. Shugars of the time study department at Cleveland, and R. D. Layman, also of Cleveland, have been moved to Detroit under the direction of J. M. Robinson. In addition to these changes D. H. Carver has been transferred from the machine shop division at Cleveland to the Ohio service division with headquarters at Cincinnati, and R. F. Terrill transferred from the general engineering department at Cleveland to the eastern service division with headquarters at New York City.

INGERSOLL-RAND COMPANY, New York, N. Y., in order to provide better sales and service facilities for its customers in northern New Jersey and certain adjacent counties of New York State, has opened a branch office at 236 High Street, Newark, N. J. F. K. Armstrong, formerly connected with the company's New York sales branch, has been appointed manager.

ROLLER-SMITH COMPANY, New York, N. Y., announces the appointment of the Petroleum Electric Company, 217 East Archer Street, Tulsa, Okla., as its representative for the state of Oklahoma. The Petroleum Electric Company will handle Roller-Smith instruments, circuit breakers and relays in that territory. The personnel of the agent company includes T. D. Williamson and C. F. Dagwell.

ADVERTISING LITERATURE

WALTER A. ZELNICKER SUPPLY COMPANY, ST. LOUIS, MO., has issued bulletins Nos. 337 and 338, covering track spikes, track bolts, tie plates, switch material, locomotives, motors, air compressors, boiler tanks, etc.

NEW DEPARTURE MANUFACTURING COMPANY, BRISTOL, CONN., is distributing a four-page circular dealing with the application of its ball bearings to the electric motor, special stress being laid on the economical side of such installation.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has recently issued Bulletin GEA No. 566, which is a handsome catalog descriptive of Novalux traffic signals.

GRISWOLD SAFETY SIGNAL COMPANY, MINNEAPOLIS, MINN., has issued a new mailing piece descriptive of its railroad crossing signs and street traffic intersection signals.

AMERICAN BROWN BOVERI ELECTRIC CORPORATION, New York City, announces that circular No. D.M. 7001 on "Constant Voltage—During Variable Loads" is available for distribution. This four-page pamphlet deals with the advantages attendant upon the use of the A.B.B. quick-acting, automatic voltage regulator. The circular is illustrated with halftones and line cuts.

O. M. EDWARDS COMPANY, INC., SYRACUSE, N. Y., has issued an attractive catalog, No. S-27, on metal sash. It is being distributed to all of the motor coach builders and operators and electric railway operators in this country and Canada. The new mailing piece is well illustrated.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, July 23, 1927 *Number 4*

An Interview with Mr. Chrysler

IT IS unfortunate that the flush of success in one line of business sometimes leads men to set themselves up as authorities on subjects of which they know practically nothing. Perhaps the spectacular personal successes that have come out of the automobile industry account for the effusions of opinion on subjects ranging the entire gamut of economic, social and industrial knowledge that seem to emanate from some of the men in that industry. Apparently this is attributable to the assumption that ability to build and sell a cheaper or a better automobile is ample qualification for bursting into the public prints on any subject under the sun.

One of the most recent flights of imagination, which betrays not only the author's entire ignorance of his subject but also an unfortunate disregard for the interests of a hard-pressed basic industry, is contained in a recent interview with Walter P. Chrysler published in the July 16 issue of *Collier's*. Under the subheading "The Trolley Car Is Doomed" Mr. Chrysler is quoted as follows:

> Our larger cities are completely out of date with their networks of trolley tracks and fleets of cumbersome street cars. In New York, Boston, Chicago, Philadelphia, St. Louis, Cleveland, Detroit, San Francisco and a dozen other cities it is simply criminal waste to tolerate them.
>
> Unsightly, clumsy and dangerous elevated railroads are a thing of the past. The air space could be used more efficiently for express motor routes.
>
> Our cities will be obliged to build double or triple-deck motor roads for different classes of traffic.

Thus nonchalantly does Mr. Chrysler read out of existence the sixth largest industry in the country—a utility upon which the very life of the modern American community depends. In a single breath he commits the future of American cities to double and triple-deck motor roads, without a thought as to where the money to finance such roads is to come from, or just how high the present excessive tax rate can be made. True, double and triple-deck roads will be necessary and will in fact be inadequate if all the people in the cities of the size he mentions are to be transported in individual machines.

It is interesting to note just how far Mr. Chrysler has permitted his imagination to lead him. According to the latest figures compiled by the National Automobile Chamber of Commerce, there were a total of 19,237,171 passenger automobiles registered in the country in 1926. Of these, 11.4 per cent, or 2,185,000, were in cities of 500,000 or more population. According to the census figures for 1920, which are obviously considerably below present conditions, the total population in these cities is 16,369,000. It is quickly evident that the number of automobiles is only 13.4 per cent of the population. Suppose we find street space for all of these automobiles to be used daily for the transportation of their owners and do away with street cars. What are the other 86.6 per cent of the people in these cities going to do for transportation?

In cities between 100,000 and 500,000 there is a total population of 16,326,000. There are in cities of this size a total of 2,251,000 automobile registrations. Here the ratio of cars to population is 13.8 per cent. In cities of from 50,000 to 100,000 population there are 5,266,000 people and 1,154,000 cars. The ratio of cars to population is slightly higher and amounts to 22 per cent. That leaves only 78 per cent of the population to find some means of acquiring an automobile for transportation.

An automobile ride costs the owner from 10 to 20 cents a mile, if he is physically and mentally able to drive himself under the congested traffic conditions that the automobile has brought about. How are you going to make it possible for every one to afford that kind of a transportation bill, Mr. Chrysler? How about that huge portion of the population to whom the price of even a street car ride is of some consequence? And remember, please, that we are talking now about direct transportation costs, not including the question of taxes to build and maintain those double and triple-deck streets you talk about. Don't you think, Mr. Chrysler, that as a transportation expert you are a pretty good automobile manufacturer and salesman?

Check Payments Reduce Danger of Payroll Robbery

PAYMENT of employees by check instead of by cash has proved to be an effective means of preventing the stealing of payrolls. In this movement the electric railway industry has played an important part. More than 50 railways in the United States and Canada have adopted the practice. The largest of these is the Public Service Railway of New Jersey. For the past year some 4,000 car and bus operators of this company have been paid by check, as well as several hundred clerks and officials. Details of the method of payment are given in an article appearing elsewhere in this issue. Other large companies which pay their employees by check are the Los Angeles Railway, the Market Street Railway of San Francisco, the Louisville Railway, the New Orleans Public Service, Inc., the Pennsylvania-Ohio system and the United Railways of St. Louis. In Canada the railways in Ottawa, Hull and Levis follow the same practice.

Advantages from the standpoint of safety of paying employees by check rather than by cash have long been recognized. The difficulty has been to devise a convenient method by which the employee could convert his check into cash. Comparatively few trainmen, shopmen or trackmen have checking accounts. Many banks, particularly in large cities, discourage the small depositor by making a charge for handling an account unless the average balance is several hundred dollars. Moreover, banking hours seldom coincide with the employees' time off duty. For these reasons, payment by check has often resulted in having the employee cash his check at a discount at some neighborhood store. Under these circum-

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stances it is natural that the men should prefer cash payment.

Thus the essence of any successful plan is facilitating the cashing of the checks. This has been accomplished in several ways by Public Service Railway. Checks can be cashed at the carhouses or turned in by operators as part of their daily receipts. They can be cashed at any of the commercial offices of the Public Service Electric & Gas Company. An arrangement has been made with a number of banks whereby pay checks will be cashed for railway employees who are known, even though they are not depositors. Storekeepers are willing to accept these checks, and as other facilities for cashing them are plentiful, they do so without discount.

Apparently the steps taken to facilitate cashing the checks have eliminated all objections on the part of the employees. At the same time the danger of payroll robbery has been removed.

Copenhagen Congress Follows Lead of Geneva and Locarno

IMPORTANT steps to improve the business conditions of continental Europe were taken at the recent congress of business men held at Geneva. The proceedings there, like those of the statesmen who met at Locarno, proved the desire of the nations of western Europe to live in harmony with each other. Now comes the equally satisfactory news that the proposed consolidation of the two principal electric railway associations in central and western Europe was carried at the Copenhagen convention of the Internationaler Strassenbahn- und Kleinbahn Verein by a unanimous vote. Thus the disruption in electric railway relations, brought about by the war, has been repaired.

Prior to 1914 the various electric railway enterprises of Europe had one association, known as the Union Internationale de Tramways et de Chemins de fer d'Intérêt local, with headquarters at Brussels. Following the armistice, this association was reorganized to exclude railways in those countries which were hostile to the Allies during the conflict. Then the properties in central Europe organized their own association, in which the proceedings were held in the German language, and whose headquarters were in Vienna. It is this organization which has just voted in Copenhagen to dissolve.

The invitation to have again a single association came from the Union. With the invitation was the offer of the Union to increase the number of members of its executive committee by six, so as to include members from the principal countries in central Europe and to conduct and publish its proceedings in German and French, instead of in the latter language only. It was also agreed that a representative from Germany would be elected as vice-president of the association as soon as there should be a vacancy. As these terms were accepted, the Internationaler Strassenbahn- und Kleinbahn Verein has passed out of existence.

The new organization should greatly advance knowledge of the best practices in electric railroading. It should be of help not only to its own members but to electric railways throughout the world, including America. European electric railway companies have been pioneers in many branches of the art. They are now making notable advances in engineering, transportation and personnel work, as well as in the efficient coordination of buses, street railways and rapid transit lines, where they exist in the same city. In fact, outside of Great Britain, co-ordination of this kind is the rule in Europe. While electric railways abroad undoubtedly have much to learn from American practice, it is equally true that a great deal of value can be obtained in the United States from a study of the practice of European properties. In union there is strength, and the reorganized European association should have an honorab'e and useful future, as it has had an honorable and useful past.

When a Joke Is Not a Joke

VITRIOL is beginning to drip from the pens of the columnists over the ukase of E. F. Albee, who runs a chain of vaudeville theaters, admonishing: "Artists, don't be cheap or thoughtless," and trusting that in the future "artists will refrain from using cheap jokes not only in reference to street car companies but to any other industry, or officials of our nation, state and city."

Literary license is, of course, the privilege of the men who write these columns. They could not exist without it. Not always, but many times it does seem that the wit of these fellows is no less far fetched than that about which Mr. Albee has issued his admonition. Still the columnists entertain oftener than they oppress, and that is a fair balance. Under Mr. Albee's ruling, Heywood Broun of the New York *World* sees the lot of the vaudeville artist becoming increasingly hard, since he must already watch his step on jokes about prohibition, Brooklyn, big business, Mr. Sumner and religion.

There is, perhaps, justification for this feeling, but there is no justification for too literal interpretation of what Mr. Albee has said. Right at the moment Mr. Broun could not remember a good subway wheeze, but said that some there must be, and there could be others. He didn't think it was for Mr. Albee to draw up an indictment against all street car jokes, for "he can't have heard them all." The theatrical producer specifically said "cheap jokes." According to Mr. Albee "theaters are not places for criticism from our stages."

It will all grist for Mr. Broun's mill. He got more than half a column of comment out of the pronounciamento. But he did not differentiate. Even cleverness is no excuse for dissimulation. Not all of us can be indifferent to quips about us as the man who, when told that some one had been talking about him none too deferentially, said that he didn't care what was said about him so long as something was said. This is the extreme view. The electric railways do not share it. Neither does Mr. Albee. They realize as Shakespeare put it:

> But he that filches from me my good name
> Robs me of that which not enriches him
> And makes me poor, indeed.

If Mr. Albee had said the things that Mr. Broun apparently thinks he said, the columnist would be in the right. But as he did not, the JOURNAL feels compelled to align itself against the clever Heywood. Meanwhile, the vaudeville artists are in a position similar to the girl with the unattractive knee who wanted to know from the doctor who conducts the daily column of advice on medicine in her local paper whether she could do anything about it. At the risk of incurring the displeasure of both Mr. Albee and Mr. Broun, the answer is repeated that there was not a thing left for her to do but to grin and bear it. That the vaudeville artists must now do. And it is just as well. As for this industry, local

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railway managers or their representatives might have a heart-to-heart talk with the managers of the theaters with the idea of each of them promoting the interests of the other, for Mr. Albee has distinctly said that "without the street cars, I can't conceive how our patrons could reach our theaters. All our patrons don't own automobiles."

Trackless Trolley Operation Waning in Popularity

WHEREAS optimistic prophecies once were heard on every hand concerning the important rôle that the trackless trolley was destined to play in local transportation these never have been realized in this country and statistics show a marked falling off in its use in recent years. Outstanding examples of trackless trolley installations were made from three to six years ago in Petersburg, Va.; Staten Island, N. Y.; Baltimore, Md.; Philadelphia, Pa.; Rochester, N. Y., and Cohoes, N. Y. In 1922 the electric railways in the United States and Canada bought a total of six trackless trolleys. Fifteen were bought the following year and seven in 1924. Since that time no more have been purchased. Financially the operations have not been a marked success. One of those mentioned above has been discontinued and the abandonment of another is in prospect.

At Petersburg trackless trolley operation on a route 3½ miles long was begun four years ago with five vehicles. The restrictions imposed by the city were such that this undertaking never had any real chance for success. The company was compelled to pay for a strip of concrete paving in the center of the street and confine its operation to that area. Thus the curb loading advantage of the trackless vehicle was lost. With concrete paving and hard rubber tires the operation was noisy and unattractive. Moreover, it was just as expensive as that of gasoline buses. Hence, at the beginning of this year the company withdrew the trackless trolleys and began the operation of buses in their stead.

On Staten Island, New York City, operation of trackless trolleys was begun in 1921 on 6 miles of route. A year later this was increased to 15 miles. At one time 22 vehicles were in service. According to latest reports, however, only seven trackless trolleys are now in operation on about 6 miles of route. The cost of operation is said to be about 12 cents per passenger carried, while the fare is only 5 cents, the deficit being made up by the city of New York.

Trackless trolley operation replaced bus operation on a suburban route in Baltimore in 1922. The change was made at the request of residents who desired a form of transportation that gave outward evidence of permanency. They agreed to underwrite the expected deficit to the extent of $32,000 during the first five years. Three trackless trolleys were operated on a 6½-mile route, divided into two 7-cent fare zones. Despite the arrangement for subsidizing this line it has not been profitable.

The Philadelphia Rapid Transit Company commenced the operation of seven trackless trolleys on a 5-mile route in 1923. At that time the fare was 7 cents cash, four tokens for 25 cents, and the operation was unprofitable. At present the fare is 8 cents cash, two tokens for 15 cents, and the operation is just about breaking even.

In 1923 the New York State Railways commenced operation of seven trackless trolleys on a 3-mile cross-town line at Rochester. The route runs through a well-built-up section and intersects five electric railway lines. The fare is 8 cents cash, two tickets for 15 cents. Trackless trolleys were selected to render this service on the theory that operating expenses, on a frequent stop line, would be less than that of motor buses. While latest reports show a failure to earn operating expenses, the management is well satisfied with the trackless trolleys and plans to continue their operation.

In Cohoes, N. Y., a suburb of Albany, a trackless trolley system was installed by the United Traction Company in 1924. Four vehicles are operated on a 3-mile route at a 7-cent fare. This service replaces that formerly given by electric rail cars. The substitution was made to enable the company to reduce its track and paving expenses and also to permit certain changes in the routing. Results of trackless trolley operation are reported by the management to be entirely satisfactory.

Outside of the United States, particularly in England, the trackless trolley has been used more widely than it has here. To a considerable extent this use has been similar to that of the motor bus in the United States in that the object has been to get rid of track and paving costs on lines where the traffic is light. The committee on foreign operation of the American Electric Railway Association reported after its extensive inspection trip in Europe in 1924 that some British tramway managers regard the trackless trolley as a vehicle intermediate between the bus for light traffic routes and the tramway for those where the traffic is heavy. This field is so narrow, however, that the committee felt that the trackless trolley could well be dispensed with. Whatever the ultimate fate of the trackless trolley may be abroad, it certainly appears to have passed the crest of its popularity in this country.

Better Acceleration Is Needed

WHEN the original Birney car was brought out a number of years ago the claim was made that it could be accelerated at 2½ to 3 m.p.h.p.s. and braked at virtually the same rate. With this car schedules could be speeded up and a measure of patronage lost in the smaller cities because of automobile competition could be regained.

The claim was substantiated, it is true. But the necessary strengthening and redesigning of certain parts added weight to the car up to 20 per cent or even more. In some of the later cars it was necessary to use motors of 30 hp. instead of the original 25-hp. motors, and even then the car was more sluggish than the original one. The rapid acceleration and braking were not maintained in many installations, so the advantages were not realized to any great extent. Meanwhile the development of the automobile has permitted it to use even faster acceleration than was customary ten years ago. Combined with higher maximum speeds in even the lightest types, the auto now far outstrips the car under city conditions.

Whatever the type of street car drive adopted, provision should be made in any new design for acceleration and braking at the highest rates that are permissible. If all parts of the equipment are properly proportioned, the rates which were adopted in the original safety car can be reached again today. No matter how comfortable the seats nor how attractive the finish, speed is today one of the most important factors that sell transportation. Cars that fail in this respect cannot hope to win the approval of the public for long. It goes without saying that the operators must take full advantage of the possibilities of the equipment and make the schedules as fast as practicable consistent with city ordinances and with safety.

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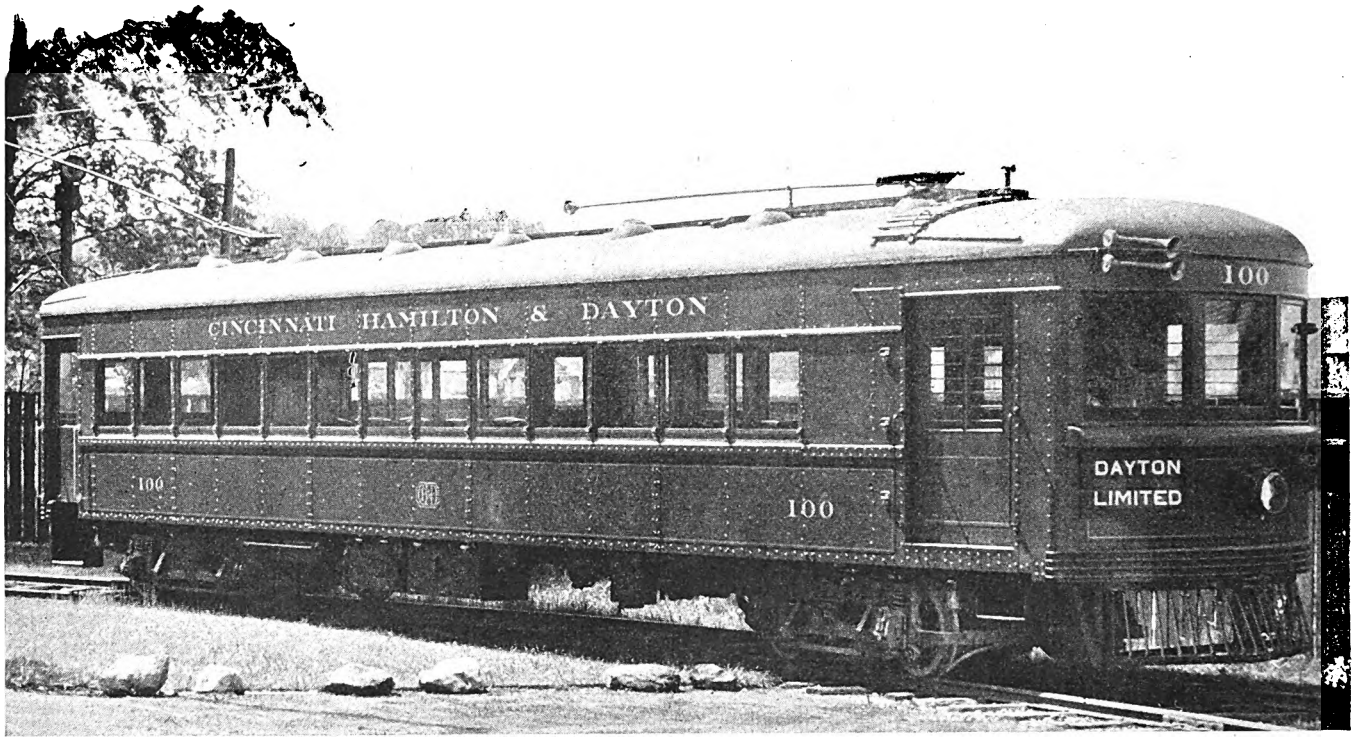

High speed, passenger comfort and safety were sought in the design of these interurban cars for the C., H. & D.

New Passenger Cars

Bid for Patronage

on the C., H. & D.

Twenty-six new cars for interurban and city service replace obsolete equipment formerly operated. Passenger comfort, general attractiveness, safety and speed were given primary consideration

This is the second of a series of three articles, the first of which was published last week, covering the rehabilitation of the Cincinnati, Hamilton & Dayton Railway. Next week the improvements made in track, power supply and freight facilities, together with the new shop and yard, will complete the account of the measures taken to bring this interurban property up to date.

THE passenger service rendered by the C., H. & D. has been put on an entirely different plane of comfort and attractiveness by the purchase of 26 new passenger cars to replace obsolete and dilapidated equipment formerly in service. This includes seven single-end combination baggage and passenger cars for main-line service, three double-end passenger cars for the same service and for train operation, ten double-truck de luxe one-man, two-man cars for Dayton city service and for service between Dayton and Miamisburg, and six single-truck one-man cars for local service in the city of Hamilton. These last-named cars have been in operation since Dec. 24, 1926. In addition to this entirely new equipment there are in operation in Hamilton city service 22 other single-truck Birney safety cars, sixteen of which were bought in 1922 and six in 1924. The group of sixteen have all been completely rehabilitated by the Cincinnati Car Company.

Seven center-entrance passenger cars of steel construction are in operation at the Dayton end of the line for hauling heavy industrial loads at the National Cash Register plant and the Frigidaire plant. These cars, five of which were built in 1914 and two in 1918, seat 70 passengers and weigh approximately 75,000 lb. each, equipped with multiple-unit control. They are capable of operation in trains of two or three cars for handling the heavy industrial peaks encountered in the rush hours.

Train Operation Contemplated

In the selection of the new interurban passenger cars several factors were considered. The present loading of the line is up to the limit of the seating capacity of the old cars, and on some runs it was necessary to operate cars double head with two train crews to avoid excessive crowding. The need for multiple-unit equipment which could be operated in trains seemed definite. It seemed logical therefore to take the step to multiple-unit control at the beginning of the new interurban car program. The size and weight of car selected was likewise dictated by the requirements of train operation. The object was to get sturdiness and solidity, which begets passenger comfort and confidence.

The structural strength, motor equipment and multiple-unit control that were considered necessary for the service

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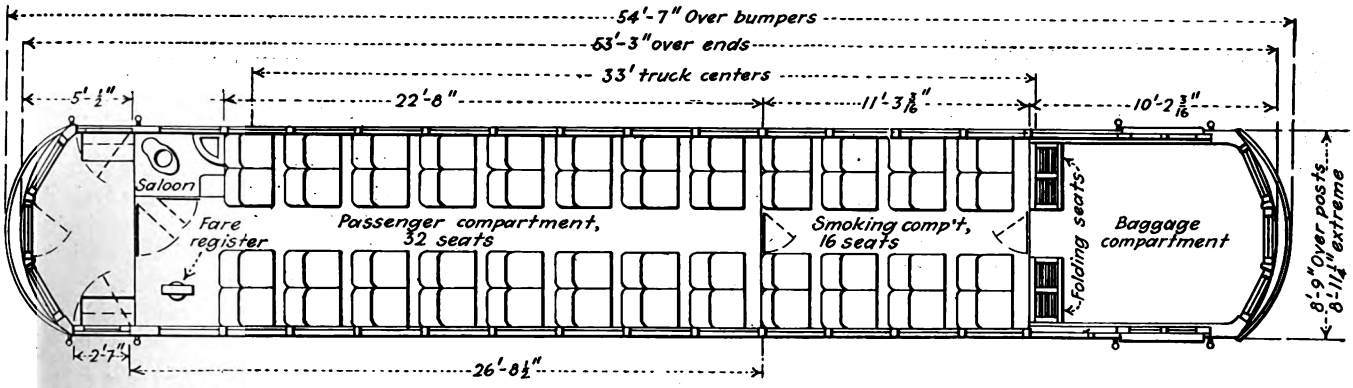


The single-end interurban cars have a baggage compartment at the front end. Fare collection will be by means of a ticket issuing register which is being tried experimentally

requirements added considerable weight over what would have been necessary with single car operation only. Since ultimate train operation was in view, it was considered important to have the car frames designed to stand up under the impacts to which they might be subjected in such service. The cars are mounted on 28-in. wheels and conventional type journal bearings, but are arranged so that they can be mounted on 37-in. wheels to bring them up to proper heights for subway operation in Cincinnati. The trucks are also arranged to take roller journal bearings if that ever becomes desirable.

On the outside, the new equipment is finished in Duco. The color scheme was selected to give durability and visibility. The management believes that one of the great hazards presented by the interurban car is that it does not give the impression of moving as rapidly as does the steam train. Consequently a brilliant Tuscan red is used for the entire exterior of the interurban cars. This, it is felt, insures visibility under conditions when there is snow on the ground, when the landscape is brown in early spring and late fall, or when the background is green, as in summer.

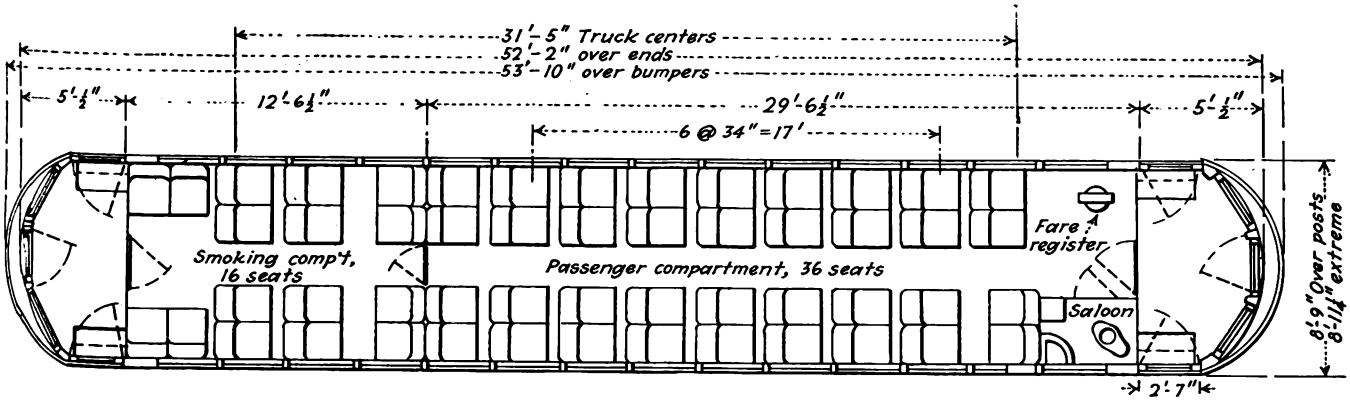
In selecting the interior finish for the cars, the basic industries of the district were considered. These are primarily the machine tool industry and the paper industry. For that reason practical requirements dictated the use of leather for seats, and the use of a color that would be as near to natural saddle leather as it was practicable to obtain. An interior finish was sought which would not give an early appearance of seediness after being used for some time by men whose clothes had been exposed for long periods to an oily atmosphere. To insure comfort to passengers, careful attention was given to the spacing and pitch of seats.

Electrically operated ticket issuing machines designed by the National Cash Register Company, that are an adaptation of that company's station machines, are to be experimentally used on the new interurban cars. This method of fare collection is novel and is still considered to be only in the experimental stage. The register itself is electrically operated to give speed, but is made compact and light to facilitate moving it about from one end of the car to the other. The registrations are arranged so that the conductor can print the passenger's ticket quickly, showing the station at which he boarded, the station to which he paid his fare, the amount of the fare and other desirable information. In addition to giving this information on the ticket, there is available in the machine a complete audit of the entire day's operations with a complete record of every passenger trip.

Designed to Attract Riders

General dimensions and specifications of the interurban cars are listed in accompanying tabulations. They possess a combination of features that should go far toward attracting the riding public. In exterior appearance they have pleasing lines. They are mounted on Brill No. 77-E-2 trucks designed for easy riding at high speed. The interior woodwork is mahogany. Center dome lights, cream ceilings and large windows further contribute to the passengers' comfort. The leather seats are luxuriously padded and fitted with foot and arm rests. A rubber tile floor covering adds to the appearance of the interior. Westinghouse multiple-unit HL control and Tomlinson automatic air and electric couplers with bus line contacts provide for train operation.

Seven of the bodies are of the combination type, fitted with passenger, smoking and baggage compartments. They will be operated normally from one end only. The remaining three have passenger and smoking compartments only and will be used for double-end operation



Floor plan of double-end interurban. Three of these cars are to be used for train operation when more than a single unit is needed

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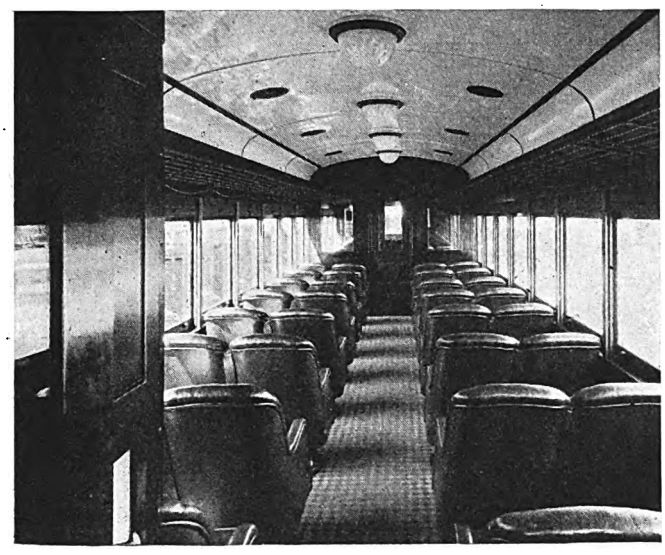

Main passenger compartment of interurban car looking toward smoking section. Seats are spaced to insure knee room.

and as the second car in two-car trains. The single-end cars must be operated at the head of the train due to the fact that they have couplers at the rear only.

The underframe of the cars is of steel throughout. The side sills are 3-in. x 3-in. x ⅜-in. rolled-steel angles extending the full length of the car. The end sills are of the "built up" type with a top and bottom cover plate and a diaphragm filler. The cross members consist of 3-in., 4.1-lb. rolled-steel channels extending the full width of the car between the side sill angles. The center sills, which are 8-in., 11.25-lb. rolled-steel channels, extend the full length of the car and are fastened to the front and rear bumper. The bolsters are also of the "built up" type and are fastened to the center sills, side sills and side sill reinforcing angle. The bumpers are made from 8-in., 11.25-lb. rolled-steel channels inverted and reinforced on the outside with a four-ribbed 7-in. section of Hedley anti-climber. Provision has been made to resist collision with higher cars by placing 12-in. x 18-in. gusset plates between the vestibule posts and the center sills.

The roof is arched and is covered with $\frac{7}{16}$-in. poplar and No. 8 canvas. The front vestibule of the single-end cars has three single windows with stationary sash. The rear vestibule has two similar windows with a train door in the middle. On the double-end cars the vestibules at each end are alike, having the two stationary windows and one train door. The steps are stationary.

At one corner of the passenger compartment is a toilet, completely equipped in Pullman fashion and with a 25-gal. water tank located between the car roof and the ceiling. The interior of the passenger compartment is finished in mahogany; ¼-in. Agasote is used for the headlining and ¼-in. Haskelite between the windows and the floor. A layer of celotex is installed as an insulator between the belt rail and the floor. The windows are single sash, thirteen per side on the single-end cars and fourteen on the double-end unit. They are fitted with curtains, which match the car interior in color. The absence of the upper sash leaves considerable space, which has been used for a neat parcel and baggage rack.

Passenger comfort was considered of prime importance in the selection of the seats. They were furnished by Hale & Kilburn. In the single-end cars they are double stationary chair type arranged in pairs, fitted with arm and foot rests and upholstered with genuine leather. In the double-end cars the seats are much the same type, but are of rotating reversible construction. The single-end car seats 32 passengers in the passenger compartment and sixteen in the smoking compartment, making a total of 48. This is exclusive of two passenger seats that are omitted at one corner for the fare register. Two folding wood seats in the baggage compartment may be occupied when necessary. The double-end car has the same seating capacity in the smoking compartment as the single-end car, but seats 36 in the passenger compartment, making a total of 52. Seats are spaced 34 in. apart to insure adequate knee room.

Interior illumination is provided with six dome lights in the passenger compartments, four in the main compartment and two in the smoker. Each light consists of a 150-watt bulb and a 12-in. bowl. At each of the four corners of the car a light is suspended from the underframe to assist passengers in boarding and alighting and to decrease the number of automobiles running into car steps and tearing them away. These lights also serve as trouble lights under the cars at night. On the front of the single-end cars there is a cowl around the belt rail, in which are located five lights to illuminate the dash at night while passing through city streets.

On each side of the car, extending the full length of the main and smoking compartments, is an aluminum truss plank housing, the front of which forms a support

GENERAL DIMENSIONS OF C., H. & D. INTERURBAN CARS

	Single-End Car	Double-End Car
Length over bumpers	54 ft. 7 in.	53 ft. 10 in.
Length over vestibules	53 ft. 3 in.	52 ft. 2 in.
Length of passenger compartment	26 ft. 8 in.	29 ft. 6½ in.
Length of smoking compartment	11 ft. 4 in.	12 ft. 6 in.
Length of baggage compartment	10 ft. 2 in.	.....
Length of rear platform	5 ft. 1 in.	.....
Length of each platform	.....	5 ft. 1 in.
Truck wheelbase	6 ft. 0 in.	6 ft. 0 in.
Width over posts	8 ft. 9 in.	8 ft. 9 in.
Extreme width of car body	8 ft. 11 in.	8 ft. 11 in.
Height from rail to top of floor	3 ft. 3½ in.	3 ft. 3½ in.
Height from rail over roof boards	12 ft. 2½ in.	12 ft. 2½ in.
Center to center of side posts	2 ft. 10 in.	2 ft. 10 in.
Truck centers	33 ft. 0 in.	31 ft. 5 in.
Width of door opening	2 ft. 7 in.	2 ft. 7 in.
Length of radius of shortest curve	35 ft. 0 in.	35 ft. 0 in.
Diameter of wheels	28 in.	28 in.
Gage of track	4 ft. 8½ in.	4 ft. 8½ in.
Seating capacity of smoking compartment	16	16
Seating capacity of passenger compartment	32	36
Total seating capacity	48	52
Total weight	57,380	59,180

GENERAL SPECIFICATIONS OF C., H. & D. INTERURBAN CARS

Builder of body	G. C. Kuhlman Car Company
Type of car	7 single-end combination passenger and baggage; 3 double-end passenger
Air brakes	Westinghouse type AMM
Bumpers	Rico anti-climbers
Car signals	Westinghouse 8-T air signal
Trimmings	Statuary bronze
Center and side bearings	Brill-Stucki
Conduits	Duratube
Control	Westinghouse HLF.
Couplers	Tomlinson automatic
Curtain fixtures	Curtain Supply No. 88
Curtain material	Pantasote
Destination sign	Hunter
Gears and pinions	Nuttall
Hand brakes	Peacock staffless
Heaters	Consolidated panel type
Headlights	Crouse-Hinds DCP
Journal boxes	Brill semi-steel
Lightning arresters	Westinghouse electrolytic
Motors	Four Westinghouse 535-A-1
Motor mounting	Inside
Paint	Duco
Registers	National Cash Register ticket
Sanders	Nichols-Lintern
Sash fixtures	Brill lockless
Seats	Hale & Kilburn
Seating material	Leather
Trolley retrievers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	More-Jones
Trucks	Brill 77-E-2
Ventilators	Brill exhaust
Wheels	28-in. rolled steel
Floor covering	U. S. rubber tile
Headlining	Agasote
Interior finish	Haskelite mahogany
Power-saving device	Economy meter

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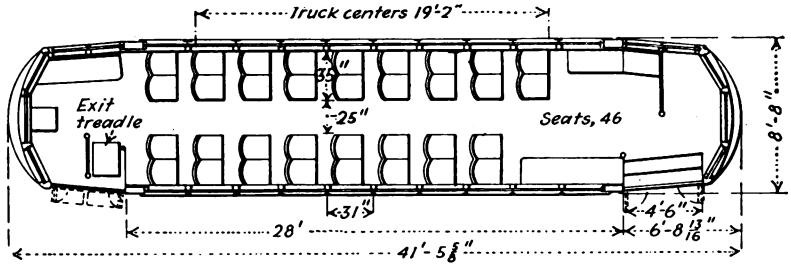
for 28 panel type single-coil, 500-watt Consolidated Car Heating Company heaters in the single-end car and 30 in the double-end unit. The heaters are wired five in series and are under control of a thermostat which may be by-passed when going over track switches by means of a tumbler switch provided for the purpose.

Motors and control were supplied by the Westinghouse Electric & Manufacturing Company. The motor is type 535-A3, 60 hp., geared 21:51 on 28-in. wheels and arranged for field control. The special requirements of the Cincinnati, Hamilton & Dayton Railway made necessary the application of a motor that could be used with small wheels and at the same time have sufficient capacity to operate the cars in either limited or local service. On level tangent track and with 600 volts at the trolley the cars will balance at approximately 54 m.p.h. The control is electro-pneumatic type HLF. The cars may be controlled from either end and provision has been made for train operation. Type M edgewise wound alloy resistors have been used. They weigh 72 lb. per car, whereas if grids had been used the weight would have been 345 lb.



Dayton city cars seat 46 and weigh 33,400 lb. complete. They are arranged for single-end operation with an automatic treadle exit at the rear.

City Losses Changed to Profit

As in the case of the interurban cars, attractiveness and passenger comfort were sought in the design of the ten double-truck, single-end, one-man, two-man cars for service in the city of Dayton and between Dayton and Miamisburg, built by the Cincinnati Car Company. They are equipped with Hale & Kilburn double bucket cross seats upholstered in genuine leather and of special deep spring design. An inside step well at the front end permits easy access to the car and an automatic treadle-operated rear exit prevents crowding and congestion in the interior. The cars are only 10 ft. 5 1/16 in. high from rail over trolley boards. This, combined with the accentuation of streamlines in the body, gives the vehicle a rakish and attractive appearance.

After only a comparatively short period of operation, the increased attractiveness of the service afforded by these cars resulted in a 13½ per cent increase in revenue and at the same time a decrease of 38.10 per cent in operating expenses. This covered a period from May 8 to June 18, in comparison with a similar period immediately preceding the installation of the new cars. It is interesting to note that the increased riding occurred at a time when there is usually a drooping curve of passenger earnings. The full significance of the effect of the equipment on revenues is brought out by a comparison with the same period of last year. On this basis there was an increase of approximately 20 per cent in revenue. The net result of increased revenue and decreased cost gives a substantial net income for the Dayton city operations, whereas this part of the company's business showed red ink during the period immediately preceding the installation of the new cars. Details of revenue and expenses are shown in a tabulation on the next page.

These cars are 41 ft. 5⅝ in. long over all, 8 ft. 8 in. wide and have a seating capacity of 46. They weigh 33,400 lb. complete. Exterior paint is Duco in all-over brilliant Tuscan red, the same as the interurban passenger equipment. The interior trimming is cherry stained mahogany. Dome lights down the center of the car provide comfortable illumination without glare. Air piping and the hand brake staff in the front vestibule are inclosed in a neat cabinet. Back of the operator a steel partition incloses a large glass window, which, while permitting passengers a clear view ahead, cuts the operator off from passengers in the body and provides a support for a roller shade to protect the operator from the body lights at night. Around the vestibule belt rail a pressed steel hood incloses five incandescent lights which illuminate the front dash. An automobile type bumper extending down below the dash tends to give the front end a finished appearance.

GENERAL DIMENSIONS OF C., H. & D. CARS FOR DAYTON CITY SERVICE

Length over all	41 ft. 5⅝ in.
Length over dashes	40 ft. 6¼ in.
Length over body	28 ft. 0 in.
Length of platform over dash	6 ft. 3 7/16 in.
Height from rail over trolley boards	10 ft. 5 1/16 in.
Height from floor to headlining	7 ft. 3 in.
Extreme width	8 ft. 8 in.
Width at side sill	8 ft. 6 in.
Height rail to first step front end	11 in.
Height first step to second step front	10¼ in.
Second step to car floor front end	10¼ in.
Rail to step rear end	16 in.
Step to car floor rear end	13 in.
Ramp in car floor	3 in.
Vestibule door openings	4 ft. 6 in.
Truck centers	19 ft. 2 in.
Truck wheelbase	5 ft. 4 in.
Diameter of wheels	26 in.
Side post centers	31 in.
Width of aisle	25 in.
Width of seats	35 in.
Seating capacity	46
Weight complete	33,400 lb.

GENERAL SPECIFICATIONS OF C., H. & D. CARS FOR DAYTON CITY SERVICE

Builder	Cincinnati Car Company
Roof covering	Lehon Company No. 8 "Mulehide"
Door-operating mechanism	National Pneumatic
Body sash glass	¼-in. plate
Vestibule center sash	¼-in. plate
Stanchions	Aluminum
Floor covering	Armstrong linoleum
Side sash and fixtures	Curtain Supply bronze
Body insulation	1-in. cork
Trimmings	Statuary bronze
Headlining	⅛-in. Agasote
Curtain fixtures	Curtain Supply No. 90 pinch
Curtain material	Pantasote double face
Heaters	Consolidated open coil
Seats	Hale & Kilburn double bucket type
Seat material	Genuine leather
Car signals	Faraday single-stroke bell
Passenger signals	Faraday buzzer
Stop light	Oskelite
Headlight	Ohio Brass
Gong	Dayton No. 64 rotary
Ventilators	Nichols-Lintern
Destination signs	Electric Service
Life guard	H.B.
Handstraps	Buffalo
Sand traps	Nichols-Lintern
Trolley retriever	Ohio Brass
Window wiper	Stormking electric
Fare box	Cleveland
Trucks	Brill No. 177-E-1-X
Motor mounting	Inside
Side bearings	Stucki
Motors	Four General Electric, 265, 35 hp.
Control	K-75
Lightning arresters	Aluminum
Trolley harp and wheels	More-Jones No. 6
Trolley base	Ohio Brass No. 4
Power-saving device	Economy meter
Air brakes	Safety devices
Compressor	Westinghouse DH-16
Paint	Duco

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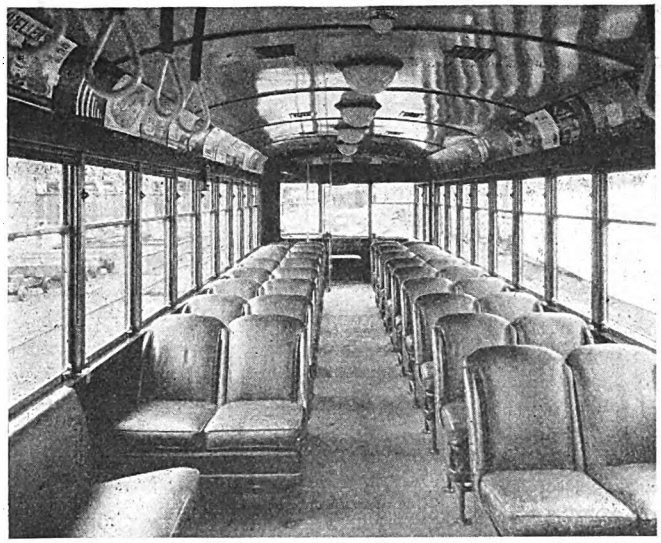
General dimensions and specifications of the cars are given in accompanying tabulations. The side sills of the underframe extend the full length of the car body on the open side and between vestibule corner posts on the closed side. The cross sills are 3-in., 6.15-lb. channels riveted under the side sills with angle clips. This same section of material forms the body end sills. The open side of each vestibule is supported by a built-up knee formed of No. 10 gage steel plate pressed to shape to support the platform load. The body bolsters are of built-up riveted box girder type. The inside is filled with ground cork and cement to deaden sound.

Side girder plates are No. 14 Armco iron, reinforced at the top with a No. 12 pressed steel belt rail channel, full length of the body side. The body framing is stiffened at each corner with a pressed box shaped pier post formed of No. 12 Armco iron and extending from the bottom of the side sill to the top of the letterboard, the inside edges of the piers being connected together by steel straps riveted in place. The car body side posts are short wood posts extending from the letterboard to the belt rail, bolted to the letterboard and carline shoes and to the belt rail with joint bolts through the cast aluminum shoes.

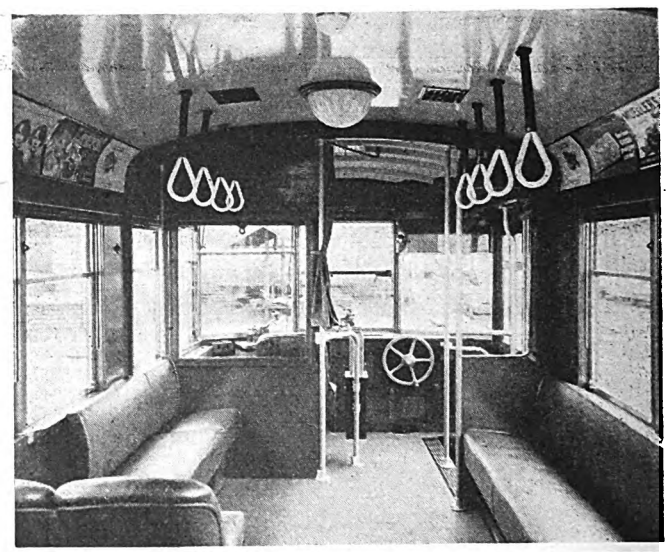
Double folding doors are provided at both the front and rear ends of the car. Control of the front doors is through a selector valve attached to the M-28 brake valve. The rear pair of rear doors may be operated either by a conductor from the interior or by a street fare collector through an outside valve provided for the purpose. The front pair of rear doors is under the control of the automatic exit treadle under the direction of the car operator on the front platform.

Panel type Consolidated open coil heaters are installed in the face of a pressed steel seat support along each side of the car. In the bottom of the steel duct thus formed an insulated conduit box is formed for power wiring. On the top of the motorman's control cabinet an auxiliary tumbler switch, as in the case of the interurban cars, is provided for short circuiting the thermostat when coasting under electric track switch contacts.

The cars are mounted on Brill No. 177-E-1-X trucks and are equipped with four G.E.-265, 35-hp. motors and K-75 control.



Comfortable leather-upholstered seats, a wide aisle and general appearance of the Dayton city cars have attracted substantial increased patronage



Looking forward from interior of Dayton city car. A steel panel with large sash back of operator cuts him off from passengers, but permits them a forward view

EFFECT OF NEW CARS ON DAYTON CITY SERVICE DIRECT OPERATING AND MAINTENANCE EXPENSE

	March 27-May 7 (Old Cars)	May 8-June 18 (New Cars)	Increase *Decrease*	Per Cent
Revenue	$5,080.89	$5,769.21	$688.32	13.58
Expenses				
Trainmen's wages	3,013.68	1,703.41	*1,310.27*	*43.48*
Car repairs, labor	129.07	100.71	*28.36*	*21.97*
Car repairs, material	152.88	22.39	*130.49*	*85.35*
Electric repairs labor	134.79	8.05	*126.74*	*94.03*
Electric repairs material	195.35	.....	*195.35*	*100.00*
Power	2,369.98	1,331.31	*1,038.67*	*43.83*
Sixth St. crossing, flagman	.....	137.42	137.42	100.00
N. C. R. crossing, flagman	.....	408.10	408.10	100.00
	$5,995.75	$3,711.39	*$2,284.36*	*38.10*
Net	*$914.86*	$2,057.82	$2,972.68	

Figures in *italic* denote decrease.

Newspaper Commends the Toronto Railway System

IN A recent issue of the *Coupler,* the magazine issued monthly by the Toronto Transportation Commission, Toronto, Canada, an editorial is included on "The Proof of the Pudding." This sets forth some of the advantages that the citizens of Toronto have derived from the rerouting of the street railway system that was inaugurated in 1923. According to the statement, the rerouting "has effected economies and more efficient operation by doing away with needless duplication." Of the benefits now derived by passengers, it is stated, "from figures submitted by the traffic study department, which were taken from the actual counts of the individual trainmen, the rerouting which has been done is saving the passengers the trouble of making 4,600,000 transfers yearly."

It is not without cause that the Toronto Transportation Commission is jubilant over the success that has attended its efforts in this direction. Few of the traveling public will deny the vast improvement that has resulted generally in street car transportation since the commission took over the service. The Toronto Transportation Commission has given the city a splendid service, one of the finest, we believe, in the world.—*Toronto Globe.*

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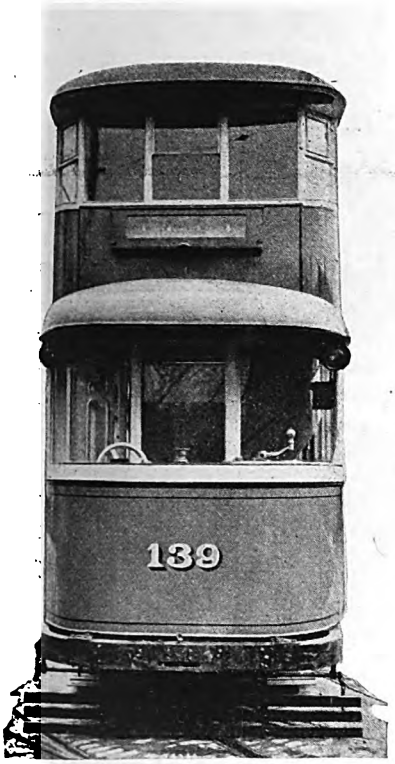
London Company Tries

Two New Types of Steel Cars

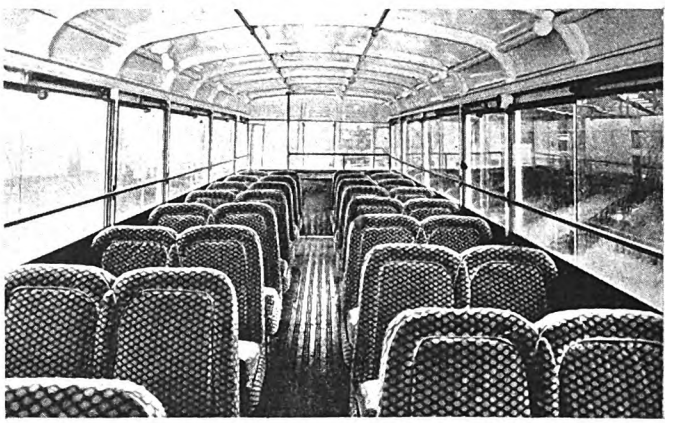


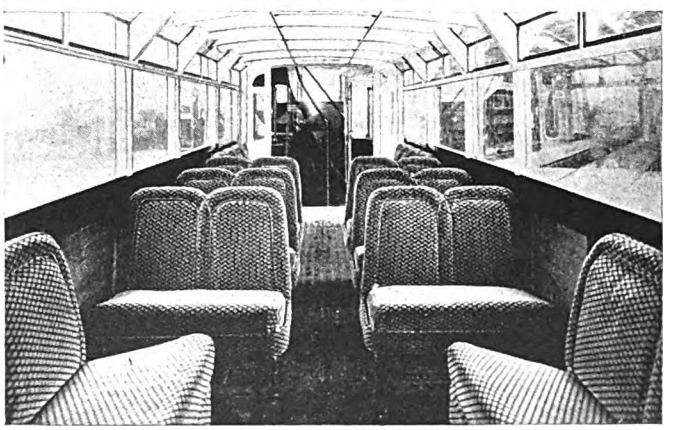
CARS of two new types have just been put in service on the Metropolitan Electric Tramways, one of the electric railway lines in the western part of London associated with the Underground group. An especially interesting feature of these cars is that one was designed by the officials of the company to represent their ideas of what a car should be. The other was designed by the officials of the associated London General Omnibus Company to embody their ideas of street railway car design. The former is painted blue and is popularly called the "Bluebell." The latter is painted red and is known as the "Poppy." The accompanying illustrations show both cars.

The body of the Bluebell is of light-weight construction, composed chiefly of 16-gage high tensile steel channel filled with wood (ash), the bottom cross members being of oak with main side members of pressed high tensile strength steel. Every pillar is attached at its lower end to the underframe and at its upper end to the roof member by a steel bracket. The platforms are level with the car floor, only the driver's compartment being at a lower level.

Balanced sash are used on the upper deck. On the lower deck ventilation is provided by a row of narrow upper sash that swing inwardly. The interiors of both decks have been designed as free as possible from corners which would be liable to collect dirt. Stainless steel is used for all hand railing and hand grip stanchions.

The seats on both decks are upholstered, those on the lower deck with moquette, those on the top deck with leather substitute. As with other London cars, the lower





A London tramway company is trying two new types of cars. This one, known as the "Poppy," was designed for London service by engineers of the London General Omnibus Company

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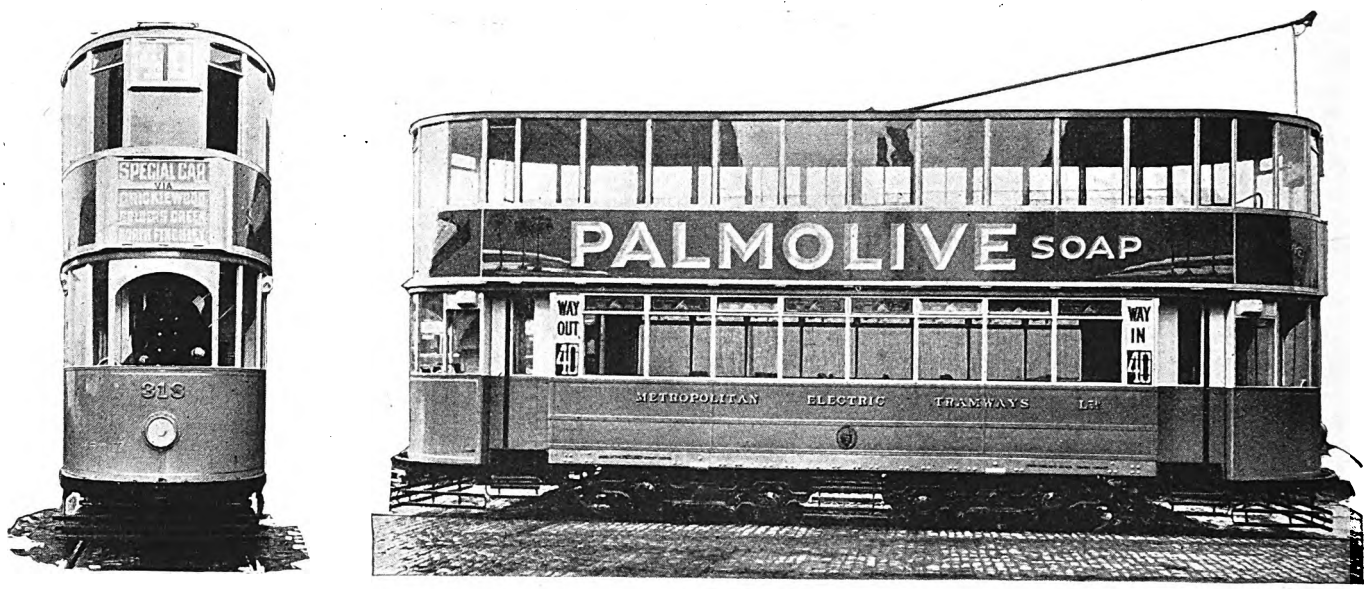


The "Bluebell" was designed by the tramway's engineers and recognizes the circulatory principle of the passenger load of the London General Omnibus Company

deck is somewhat narrower than the upper as it is considered necessary to provide room between passing cars for a man to stand. Hence the lower deck seats only three passengers across the car, while the upper deck seats four. The seats are of the usual reversible type.

The flooring on the lower deck is of gray rubber, on the upper deck of slats.

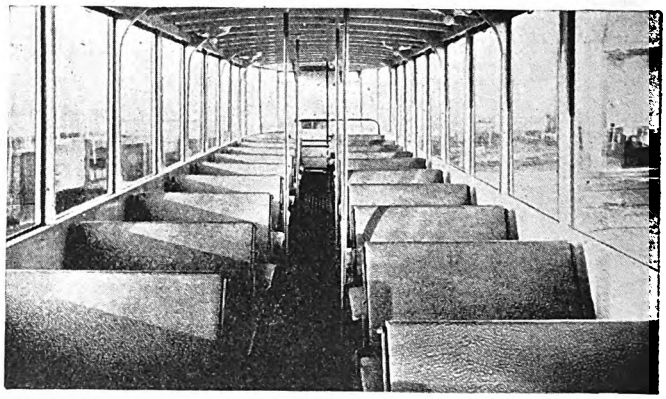
Air brakes acting on both track and wheels are used, with emergency cocks at each end of the car for application of brakes by conductor or passengers in case of need. The brakes are interlocked with pneumatic sanders which apply sand immediately in front of the leading wheels. There are also hand brakes.

The trucks are maximum traction, with 28-in. and 31¾-in. wheels. The car journal boxes are equipped with roller bearings and the armature shafts with ball or roller bearings. There are two motors of 50 hp. each, weighing 35 lb. per rated horsepower, as compared with 56 lb. for the older motors. The specifications for these motors call for 30 m.p.h. for the car on the level, 15 m.p.h. on a grade of 5 per cent and schedule speed of 12 m.p.h. with four stops per mile of ten seconds each.

The car is one of the few in Europe with fully inclosed and separate entrance and exit and passengers are urged to enter by the rear and leave by the front platform. The platforms are flush with the body of the car. Folding steps interlock with the doors.

On the Poppy the brakes, sand boxes and trucks are the same as on the Bluebell. The motors are also practically identical, except that they are of different make and the controller is operated by a camshaft. The platforms are quite different, as only the rear platform is designed for entrance and exit. The motorman is shut away from the rest of the car, though there is a small doorway at the front end for use by passengers in emergency. The step on the rear platform has a double-fold motion; that is, as the door is closed the step tread rises to a vertical position, then it, with the riser, swings to a horizontal position to fill up the opening in the platform.

The body construction of the Poppy is on the same principle as used in the London buses. The two main side sills, which are deep section steel channels, extend from buffer to buffer, but are bent inwardly toward the end of the car and strengthened at the bends by thick steel plates. The side posts are of ash, flitched with steel and bracketed to cross members as in bus construc-



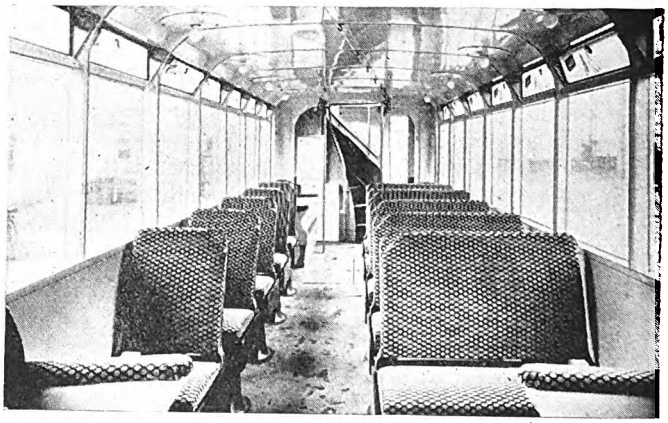


TABLE SHOWING PRINCIPAL DATA OF NEW METROPOLITAN ELECTRIC CARS

	"Bluebell"	"Poppy"	Existing Type
Length over buffers	36 ft. 4 in.	36 ft. 1 in.	34 ft. 8 in.
Length of canopies	35 ft. 4 in.	35 ft. 8 in.	33 ft. 2 in.
Maximum over-all width	7 ft.	7 ft.	7 ft.
Width inside lower saloon	6 ft. 4 in.	6 ft. 3¾ in.	6 ft. 0½ in.
Width inside upper saloon	6 ft. 7 in.	6 ft. 4½ in.	6 ft. 4 in.
Height lower saloon	6 ft. 3 in.	6 ft. 0½ in.	6 ft. 0½ in.
Height upper saloon	6 ft. 1 in.	6 ft. 0½ in.	6 ft. 0½ in.
Height over all from rail	15 ft. 2 in.	16 ft. 2 in.	15 ft. 5¾ in.
Height of car floor from rail	2 ft. 5 in.	2 ft. 6 in.	2 ft. 9½ in.
Weight of body with equipment	13,440 lb.	21,168 lb.	23,632 lb.
Weight of trucks with equipment	14,000 lb.	14,000 lb.	13,440 lb.
Total weight unloaded	27,440 lb.	35,280 lb.	37,072 lb.
Seating capacity lower saloon	27	28	27
Seating capacity upper saloon	44	36	46
Total seating capacity	71	64	73
Total carrying capacity, including standing	105	80	85

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tion, the two corner posts at each end being strongly braced together for longitudinal strength. The roof of the upper deck is of beaten aluminum sheet, suitably strengthened wherever necessary for the trolley plank. Railings and grab handles are of black vulcanite covered metal and a light natural wood finish is used for the car interior.

Moquette upholstery is used for all seats, those on the lower deck saloon being partly cross and partly longitudinal, but the method of reversal on both decks is different than in the Bluebell. Two adjoining cross seats are jointed and pivoted at the center so that they swing around. Each seat back has been designed with special springs, so arranged that the central portion is more easily compressed than the outside edge. This tends to reduce discomfort to passengers when the car passes around curves.

Both cars are double ended.

A few words here about the Metropolitan Electric Tramways and its associated companies, the London United Tramways and the South Metropolitan Electric Tramways & Lighting Company, may not be inappropriate. They are in the northern and western sections of the London district and operate about 600 double-deck cars. The average speed (obtained by dividing the car-miles by the car-hours) is between 9½ and 10 m.p.h. Though not in the center of London, these lines encounter considerable street congestion, as a great many of the streets on which there is a double track are only 32 ft. between curb lines. The fare basis is a penny a mile, and as the average fare is 1½d (3 cents) the average ride can be considered as 1½ miles or slightly less.

Besides the construction of these cars, the company has recently re-equipped about 70 of its older cars with high-speed motors, moquette upholstered cross seats, better lighting, etc. It has also built an experimental two-car train with one double-deck and one single-deck car, both equipped with motors and air brakes. The latter equipment is unusual in London, where the magnetic brake has been the rule, but air brakes were thought better for train operation. Another trial the company is to make is with the bow trolley, which will be installed on one of its principal lines, as some trouble has been experienced in the past from trolley wheels becoming detached and falling on passengers.

Milwaukee's Year Book of Accomplishments

UNUSUAL activity in the utility field is told of by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., in a 50-page year book of convincing text, informative maps, illuminating charts and ingenious arrangement of reproductions of pen and ink sketches. Within its pages the company describes its enterprises and accomplishments of the past year. A cursory glance at the pages devoted to the educational department are enough to make one feel that "the trained man wins" and the picture of the operating room of the medical department inspires confidence by the completeness of its facilities. In a foreword President S. B. Way says the purpose of the book is to provide the public with a more intimate knowledge of the properties, operations and services. It will add to the fund of information acquired by public visitors through the ceremony of Open House Week, beginning Nov. 8.

Paying Trainmen by Check Successful

MARKED success has attended the first year's operation of a plan to pay all employees of the Public Service Railway, Newark, N. J., by check instead of by cash. This method of paying employees was instituted in July, 1926, shortly after the wanton killing of a paymaster in an unsuccessful attempt at robbery. For some time previous the scheme had been under consideration, but this unfortunate event convinced both the railway officials and the employees of the need for check payment and hastened the establishment of the present method.

A simple and effective procedure has been adopted for the payment of trainmen. Time sheets are made out at the various carhouses in the same manner as before and sent to the auditor's office, where the payrolls are prepared. The latter differs somewhat from that formerly used. Addressograph plates giving the man's name, address and payroll symbol have been prepared. The symbol consists of the letter "R," denoting that it is a railway payroll and a number indicating the day of the week when the wages are paid at the particular carhouse for which it is being prepared. This information appears in a column at the left of the payroll sheet. To the right of the man's name are entered his working time for the week, wages, deduction for insurance, deduction for purchases of the company stock and at the right the amount actually due.

From the auditor's office the payroll is sent to the addressograph department, where checks are made out. A special check form is used. The procedure consists of three operations. The first is the placing of the man's name, etc., on the check by means of the addressograph already mentioned. The second operation is the entering of the amount. Finally the signature of the treasurer is inserted with the aid of a check-writing machine. Preparation of checks is accomplished at a rate slightly faster than one per minute.

The checks are then taken by the paymaster to the carhouse. He carries with him only a nominal amount of cash and does not require the protection formerly afforded by an armored pay car. This used to be necessary because payrolls frequently total more than $10,000 for the larger carhouses employing 250 to 300 men, averaging $35 to $40 per week. Under the present plan he travels by automobile unaccompanied yet in entire safety.

At the carhouses the men present their time slips and receive their checks. The checks are cashed by the receiver at the carhouse up to the extent of the funds available. They can be cashed also at the commercial offices of the Public Service Electric & Gas Company. Another method of disposal is for the trainman to turn in his check as part of the day's receipts. The practicability of this last method, however, is limited because not all runs take in sufficient money to cover the amount of the check. Banks will cash trainmen's checks for the individual named thereon provided he is known, but will not cash them for other people. They are acceptable for deposits, however, to the credit of any one. Hence storekeepers do not hesitate to accommodate the trainmen by cashing their checks.

Experience shows that paying the trainmen by check is more rapid than paying by cash. No serious difficul-

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ties have arisen during the last year in connection with this plan and the men are well satisfied with it. Among the 4,000 bus and car operators, a surprising number have checking accounts at various banks. It is believed that the new system has to some extent encouraged this practice.

Payment by check introduced a legal complication at first. Under the New Jersey law it is required that all workers be paid by their employers in cash. Officials of the company discussed this matter with the State Department of Labor, however, and it was agreed that no objection would be raised against the present plan on account of its obvious advantages from the standpoint of safety.

No Deterioration in 23-Year-Old Anchor Plates

By S. L. Foster
Superintendent of Overhead Lines Market Street Railway San Francisco, Cal.

HOLDING the corner poles of a transmission line rigidly, safely and permanently may be only a detail of construction, but it is a very essential one. Eighty-three years ago, when Morse invented the electric telegraph and the first pole line in this country was built to support the wire between Washington and Baltimore, the constructor of this line probably invented the wood log for an anchor for his corner poles. Today the cumbersome log anchor is still used by many. It has been improved in durability by replacing the black iron rod with a hot dip galvanized iron one and by treating the wood log with a preservative. It still has serious defects, besides requiring great excavation when installed.

The continuous strain of the guy, concentrated as it is on the small surface of the wood log under the nut of the rod, results in the nut being forced into the wood. The effect of this creepage of the rod is multiplied in an amazing ratio, depending on the height of the pole guyed and the distance the anchor is from the base of the pole. The additional sag thrown into the conductors at the tops of the poles adjacent to the guyed corner often spoils the looks of the transmission line and is never fully remedied afterward.

If a dead-end pole is assumed to be 50 ft. high, the anchor set 20 ft. from the pole, the span nearest the pole 120 ft. long and the original sag in this span of conductors 12 in., the top of the pole will go over 1.25 in. if the anchor rod is drawn ½ in. into the log. The 12-in. sag in the conductors will be increased to about 29 in.

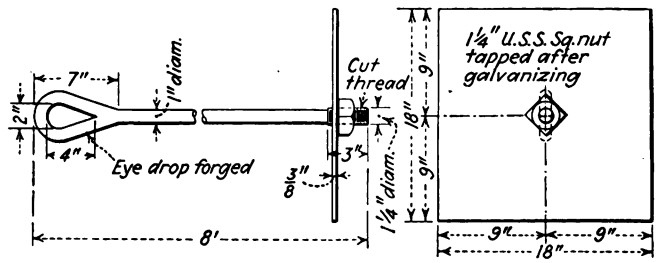
Before the galvanized rod or creosoted log appeared the writer condemned the wood log anchor for use on street railway heavy curve trolley and feeder cable strains as being extravagant in first installation cost, of indefinite useful life, subject to progressive rod creepage from gradual sinking of the nut of the anchor rod into the wood and of no ultimate salvage value. The substitute adopted was a ⅜-in. thick 18-in. square galvanized iron plate with a central hole for a 1-in. galvanized iron rod 8 ft. long and upset to 1¼ in. for 3 in. before threading at the lower end and providing an oval welded eye at the upper end.

This unit gave 2¼ sq.ft. of flat unyielding surface to resist the upward pull. The plate was made square, as more surface can be obtained from a stock plate for a dollar in square shapes than in round on account of the waste in cutting out round shapes.

The upsetting of the rod at the lower end to 1¼ in. diameter before threading was to obtain the same cross-section of metal at the base of the thread as existed elsewhere on the rod. When a 1-in. rod is cut by the die its cross-section is reduced by 30 per cent. The cross-section at the base of the thread on a 1¼-in. rod is practically the same as on an unthreaded 1-in. rod.

From tests it was calculated that such a plate would resist a pull of 33,000 lb. when buried 7 ft. in firm soil. The 1-in. rod at 50,000 lb. per square inch ultimate strength for wrought iron would sustain a safe pull of 20,000 lb. with a factor of safety of 2. As the breaking strength of ½-in. seven-strand galvanized steel cable is 10,000 lb. this plate would withstand a strain that would break off two ½-in. steel guy cables. There would be no creepage of the rod and whenever this anchor was dispensed with the galvanized plate and rod could be dug out cheaply as good as new and used elsewhere. When installing, only the digging of an 18-in. square hole was required.

When the Market Street Railway built its Cliff Line in 1904 out by the Golden Gate and facing the destructive fogs and salt spray of the Pacific Ocean this form of galvanized anchor plate was used. Due to extensive landslides, this car line was recently abandoned and these anchors were dug out. All of them were found to be practically as good as new and were taken into stock at full value and will be used elsewhere as needed. No wood log anchor installed 23 years ago would have been worth digging out.



Anchor rod and plate as used by the Market Street Railway

Today this unit of anchor plate and rod costs $3.50. It costs about $2.50 to install. It cost about $1.75 each to dig out on this relatively inaccessible location where the digging tools and anchors had to be carried long distances by the men. None of this type of anchor has ever pulled out or failed in any way.

In this locality a wood log anchor with a maximum strength of 20,000 lb. would cost about $32 to install.

After 25 years practical experience with this form of guy anchor it is felt more than ever that the wood log form has none of the advantages possessed by the galvanized iron plate, such as low cost, decreased excavation, stability, durability and salvage value.

There have been many forms of guy anchors invented for light and medium strains, but for strains of the order of 20,000 lb. nothing has come to the writer's attention equal to our simple, unyielding, 18-in. square foolproof iron plate.

For heavier strains and more than one guy a larger plate and an additional rod naturally suggest themselves. Boulders or old paving blocks placed above the plate and thorough tamping of the backfill will enlarge the scope of the anchor and increase its resistance.

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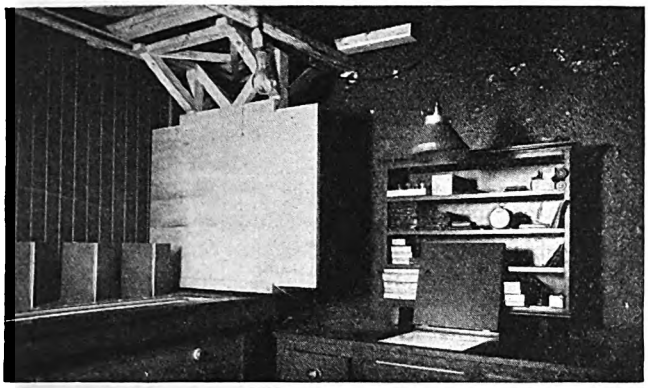
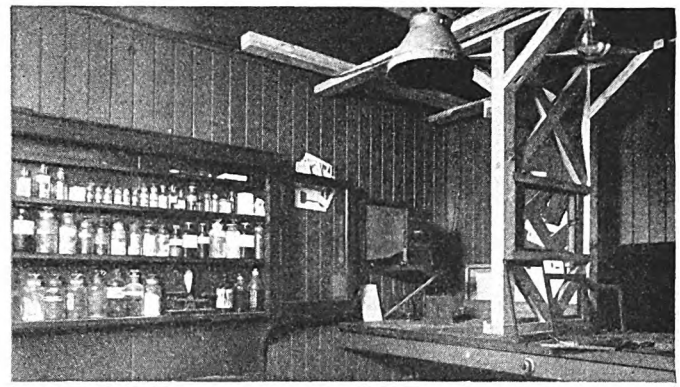


A corner of the dark room showing the overhead enlarging easel fitted with a 36x42-in. drawing board. At the left is the panoramic printer, 4x10, and at the right is the printing table



The overhead enlarging easel with the drawing board removed, showing accommodation for 11x14 printing frame with kits. At the left is the chemical cabinet

Making Records with the Camera

Toronto Transportation Commission has well-organized photographic department which makes pictures of all important happenings on the system, as well as preparing blueprints and other reproductions

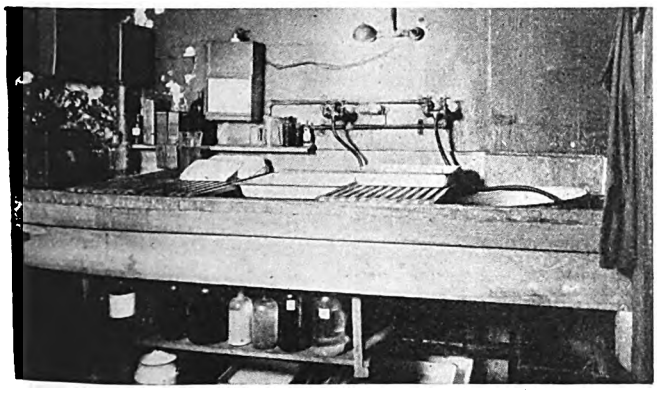
PHOTOGRAPHY has been called to the aid of the Toronto Transportation Commission, Toronto, Canada, to a greater extent than on the average American railway. A special department has been organized to serve all the departments of the system by taking photographs depicting any situation which it is deemed desirable to show permanently. In this way a most valuable record has been built up which has been used to advantage on many occasions.

One of the regular assignments of the department is to take pictures showing damage sustained in accidents. All cars, buses or other equipment involved are photographed. Damaged automobiles or wagons are also taken, as well as pictures that show the appearance of the roadway at the scene of the accident. It has been found that illustrations showing the streaks of rubber worn off from skidding tires are definite proof of the speed and direction of approach of the vehicle.

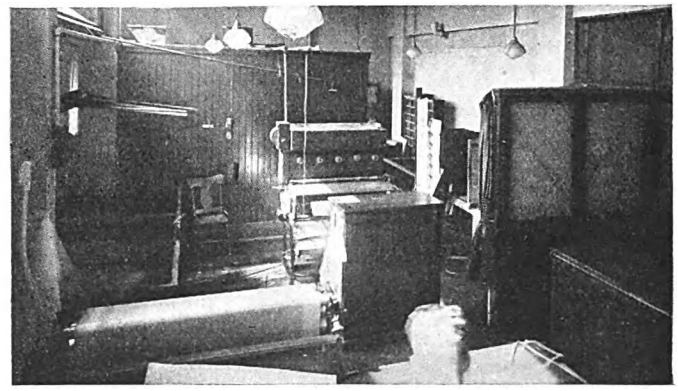
Another regular use of photographs is in connection with construction work. The usual progress pictures are always taken. A use of photographs that is not so common is to show the conditions that existed prior to any blasting or extensive destruction of property necessitated by construction. All trees that are to be removed are photographed, as are trees that are to undergo extensive trimming.

In connection with the ordering of replacement parts, photographs of defective or broken pieces are often taken. It has been found agreeable in numerous instances to send the photograph to the manufacturer instead of the part itself, thus getting an equally good adjustment without the cost and delay incident to boxing the piece and shipping it.

Photographs of streets are made to show the wear of paving and rail. These are taken periodically and are valuable evidence if any dispute arises with the city as to the cause of deterioration. Close-up views of worn rail and of all special work are likewise standard. In



The dark room sink is lead lined and is fitted with both hot and cold water service. Racks are used for supporting the developing trays



A view of the blueprint room. At the rear is the photographic dark room, while at the center right can be seen the 14x17 copying camera and the lamp used for illumination

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connection with the tests being made on the Sandberg sorbitic process of rail hardening, a series of views is being taken every three months. These are making a valuable record that will be available permanently.

A considerable amount of work is done in connection with publicity material. Points of interest in Toronto and vicinity that are reached by the commission's cars and coaches make an attractive appeal to the public. A rather unusual series of photographs was made of specimens in the city museum. A record is made of any public event in which the commission is interested, such as ceremonies in connection with the opening of new lines. Views showing vehicle parking and congestion effectively bring home to the public the evils of too much traffic on the streets.

Pictures have been taken in a number of instances to show the manner in which the commission has beautified the grounds in the vicinity of carhouses and other structures, making it evident that the buildings are not eyesores.

Photographs are taken of every type of car, bus or coach. These show both interior and exterior. Any important changes in the vehicles are also recorded in similar manner. Special photographs of coaches have been taken for color matching at the factory. The photographs are not colored, but on them are indicated the exact portions of the body which are to be finished in a desired shade. Such marked photographs, sent to the factory, have made it a simple matter to duplicate the appearance of existing equipment.

Another activity of the photographic department is the production of lantern slides for lectures of the various officials. These lectures have been instrumental in the publicity department's work of building up good will. The activities of the railway as depicted have brought out many favorable comments.

Besides this original photographic work, the department makes copies of drawings, photostats, and in fact any material that it is desirable to reproduce. Blueprints, blue-line prints, Vandykes and oxalid prints are also made in quantity.

All work done by the department is made at the request of the department head interested. Order forms are numbered serially and are made out in triplicate. Separate forms, as shown in the accompanying illustrations, are used for photographic work and line prints. The three copies of each are identical except for color. The original of the photograph order is white, the duplicate pink and the triplicate blue; while for blueprints the original is blue, the duplicate white and the triplicate yellow.

The original and the duplicate are sent with the order, while the triplicate is retained in the files of the department making the request. When the work is completed the original is receipted by the departments ordering and the duplicate is returned with the package.

The department is on a self-sustaining basis, the other departments being charged a rate which is considerably less than that charged by commercial photographers. For instance, $1 is the price for each negative, with an additional charge of $1 per hour for time of the photographer in the field. A charge of 25 cents for each 5x8-in. print is made. Blueprinting and other work of like character is charged on a similar basis.

Form 28—1M—12-25

TORONTO TRANSPORTATION COMMISSION

PHOTOGRAPHY AND BLUE PRINTING DEPARTMENT No. 2582

PLEASE SUPPLY PHOTOGRAPHS DATE ..... 192....

FOR DEPT. CHARGE

ORDERED BY

DESCRIPTION TO SHOW ON PHOTOGRAPH

No. OF NEGATIVES	SIZE	FLASH	No. of PRINTS	No. OF ENLARGEMENTS	PLAIN	MATT	GLOSS	Backed & Hinged	BACKED	COTTON	CARD	Hours / Negatives / Prints / TOTAL

NEGATIVES	PRINTED	FINISHED	INDEXED	ENTERED AND CHARGED	RECEIVED
BY					
DATE					DATE

ORIGINAL—For Photographic Dept.

Form 4 S. 25c—8-25

TORONTO TRANSPORTATION COMMISSION

No. 12136

PHOTOGRAPHY AND BLUE PRINTING DEPARTMENT

PLEASE SUPPLY BLUE PRINTS TO..... DATE..... 192....

AND CHARGE ACCOUNT..... ORIGINAL—For Blue Print Dept.

DESCRIPTION	No. OF PRINTS	SIZE	SQUARE FEET

TOTAL SQUARE FEET

ORDERED BY.....

WHEN WANTED.....

RECEIVED THE ABOVE

Orders for photographic work or blueprints are made out in triplicate on the forms shown, which are 5x8 in.

Equipment of Laboratory

The department has standardized on 5x7-in. negatives for all photographs. When larger or smaller prints are wanted they are made with an enlarging camera. The regular equipment consists of a 5x7-in. view camera equipped with a No. 9 Zeiss Protar convertible lens of 7-in. focus mounted in a compound shutter, and a 5x7 Graflex press camera, using the Protar cells only in an extra barrel. The press camera is built to accommodate an 8½-in. lens, so that the flange must be set back as far as it can be without interfering with the action of the mirror.

For reproduction work there is a 14x17-in. copying camera fitted with a 16½-in. Cooke process lens. It has a prism for reversing and a set of filters for color screen work. Light is supplied to the copy board by two upright batteries of nitrogen lamps, each mounted on a movable stand. Enlargements and reductions from negatives are made with an 8x10 revolving back enlarger fitted with an extension for the accommodation of the 16½-in. Cooke process lens. This makes all the en-

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OUTPUT OF PHOTOGRAPHIC DEPARTMENT, TORONTO TRANSPORTATION COMMISSION, JAN. 2 TO MAY 31, 1927

Printing Work	Sq.Ft.	Photographic Work	Number
Blueprints	20,355	Plates, 5x7	270
Blue-line prints	2,738	Films, 14x17	2
Ozalid prints	2,862	Prints, 5x8	810
Vandykes	620	Lantern slides	50
Black-line prints	25	Progress charts	81
White linen prints	142	Enlargments (up to 24x36)	150
Blue linen prints	60	Reductions	50

largements, up to a maximum of 26x42 in. For reduction, as in making lantern slides, the Protar lens used in the view and Graflex cameras are employed. Illumination is furnished by a Cooper-Hewitt mercury vapor lamp.

In addition to the standard cameras, the department has a 10-in. Folmer & Schwing panoramic camera, made by the Eastman Kodak Company.

The laboratory equipment includes a 4-ft. printing frame with a battery of lights in a printing box. This is installed in the dark room, as shown in one of the illustrations. The greater portion of the contact printing, however, is done on a printing table installed in the dark room. The light box is 11x14, with an aperture below the glass to allow for dodging. Adjacent to the printing table is a lead-lined sink of ample capacity to accommodate the largest prints handled. A complete assortment of trays from 5x7-in. to 38x42-in. is included.

For the production of blueprints and other line work, there is a 42-in. Revolute Blue Streak printing machine, rated at 250 volts, 100 amp., and having four arcs. There is also a Revolute drying machine, rated 250 volts and 60 amp.; an ammonia developing tank, a washing tank and a potash tank.

An indication of the amount of work handled may be gained from the table in the opposite column.

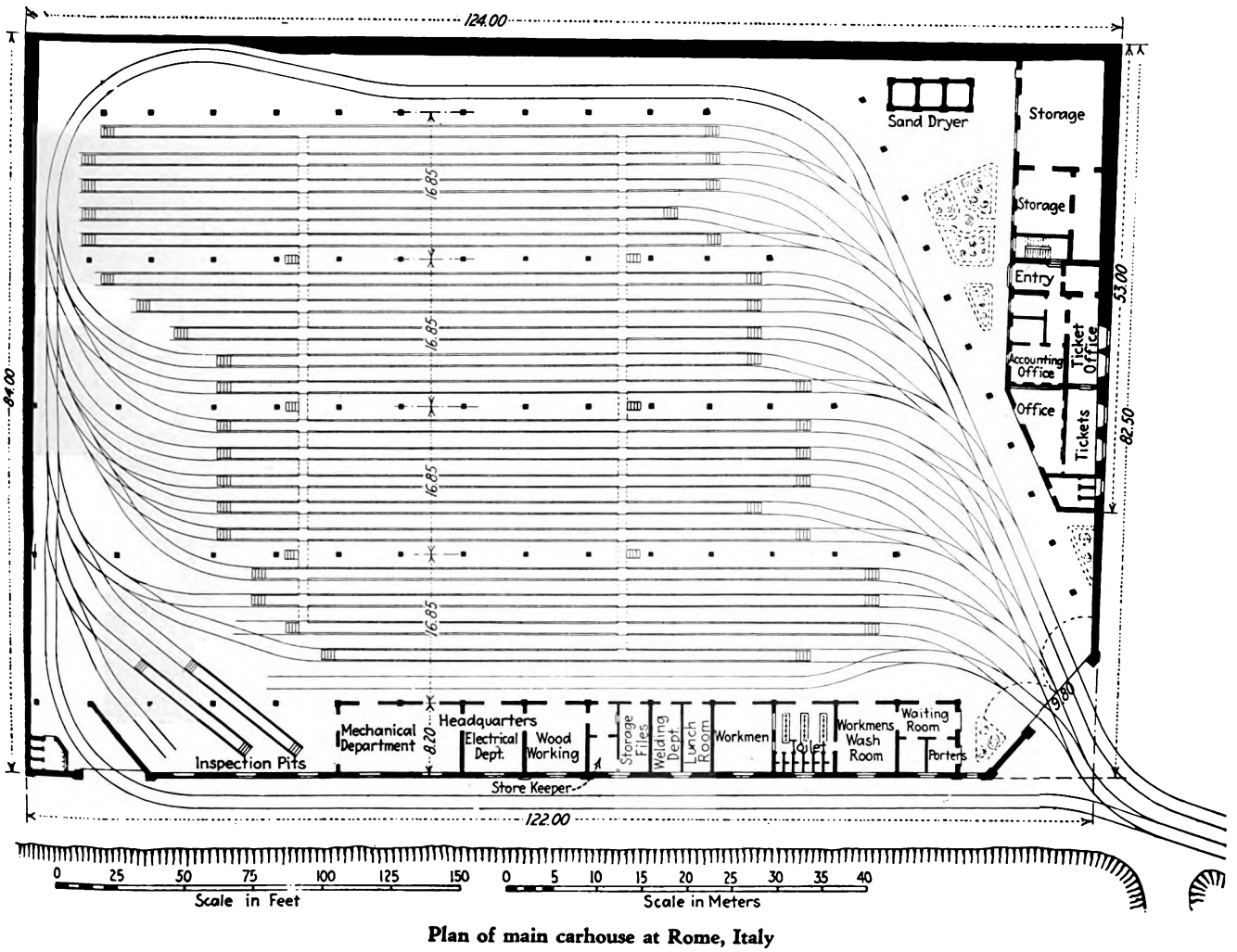
Each negative is titled by the use of a Vandyke negative made from a typewritten slip. This is pasted to the negative so that the title is printed with black letters below the picture. The reason for making 5x8 prints from 5x7 negatives is to provide an inch at the left for binding, as the prints are normally kept in covers.

A rule of the department is that a duplicate print from each negative is filed in the library of the commission. These prints are filed by subjects, so that pictures may be found readily. The department was started Oct. 15, 1922, and since then about 6,000 negatives have been made. Filed in this manner, the record is becoming more valuable all the time.

Rome Building Large Shops

WORK on the construction of some large repair shops has just been begun by the tramway system in Rome, Italy. The traffic on this system is showing a continuous growth and it does not suffer from competition with private automobiles to the same extent as corresponding properties in the United States. This is partly because ownership of automobiles is far less common than in this country and partly on account of the narrow streets in the business district in Rome, which discourage the use of private cars.

The Rome system was fortunate in securing for its new shops a large tract formerly the property of a car



Plan of main carhouse at Rome, Italy

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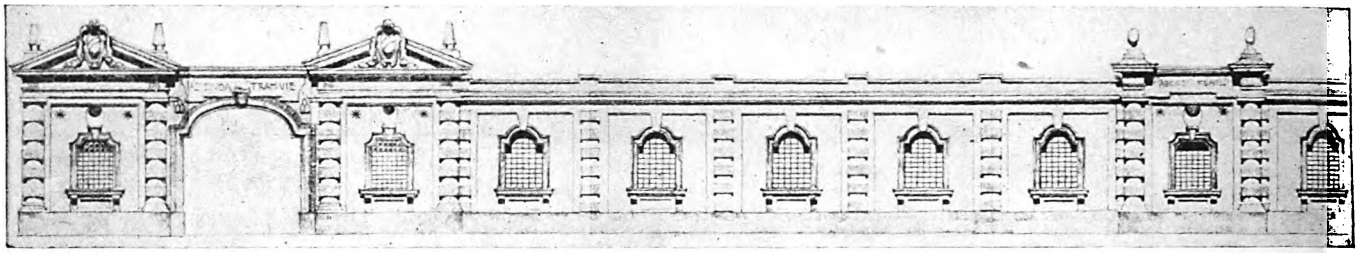


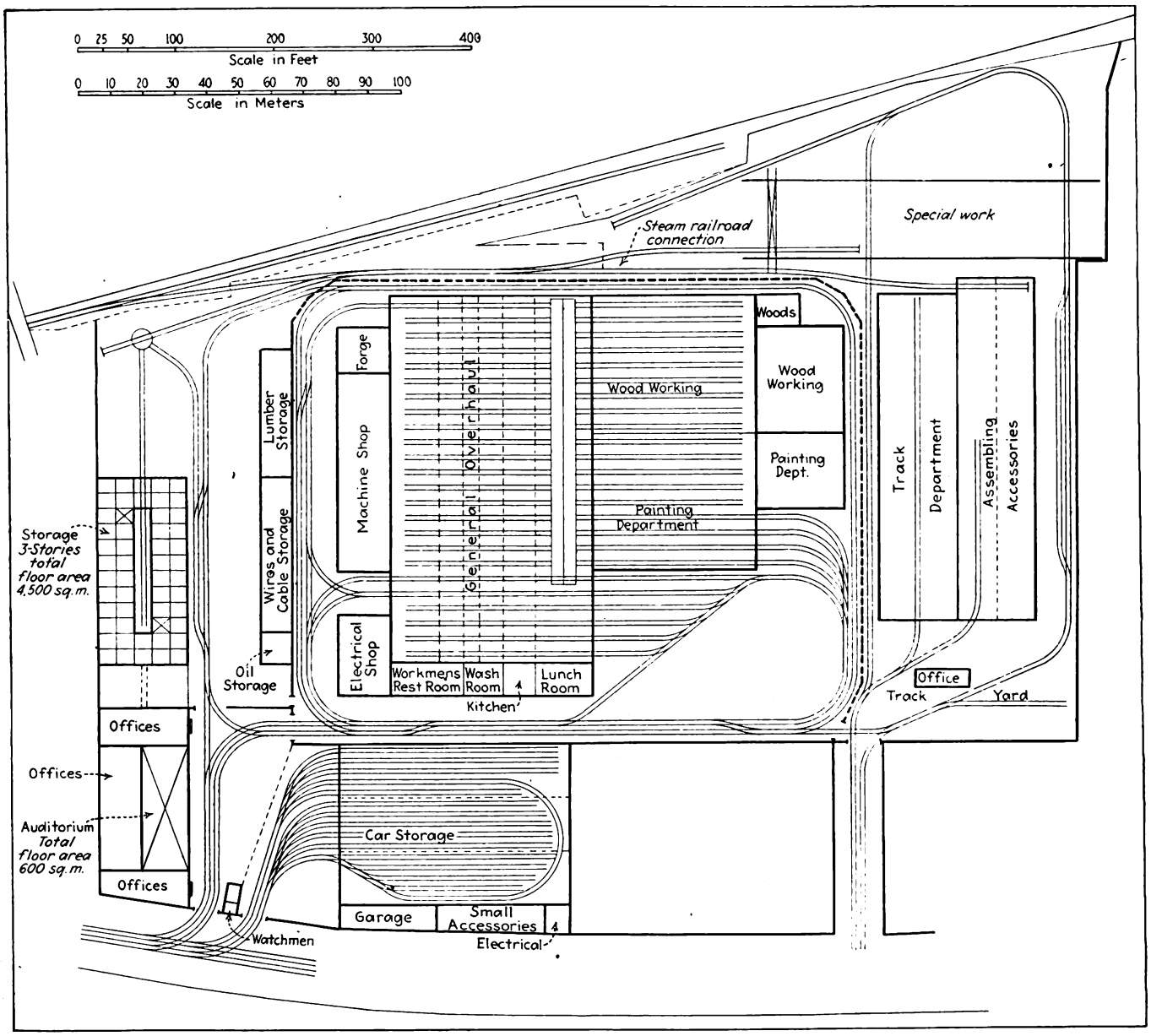
The Italian love of beauty in architecture is shown in the exterior design of the Rome repair shops

building company but now abandoned. While in the suburbs, this plot is not very far from the central loading point of the system. Altogether, the area available for the construction of the new shops is 75,000 square meters, or about 18 acres. Work has been begun here, and it is expected that the new shops will be in use some time in 1928. The cost is estimated at 30,000,000 lire, or about $1,500,000.

As shown in the accompanying plan, it is proposed to consolidate at this point both the repair work for the rolling stock and the yards of the track department.

The shop illustrated is designed for use in general repair and overhaul work only, light repairs, as well as inspection, being carried on at the carhouses. The layout of the main carhouse of the Rome system is shown in the illustration on page 149.

All of the cars now in use are single-truck cars, but some of these cars haul trailers. The trail car mileage in 1925 amounted to about half the motor car mileage, or about 6,513,400 trail car-miles as compared with 13,106,000 motor car-miles. The number of passengers carried during the year was 186,635,463. There are about 670 cars in all and 400 of these are equipped with motors.



New shops to be built by the Rome Municipal Tramway. These shops are now under construction at an expected cost of $1,500,000

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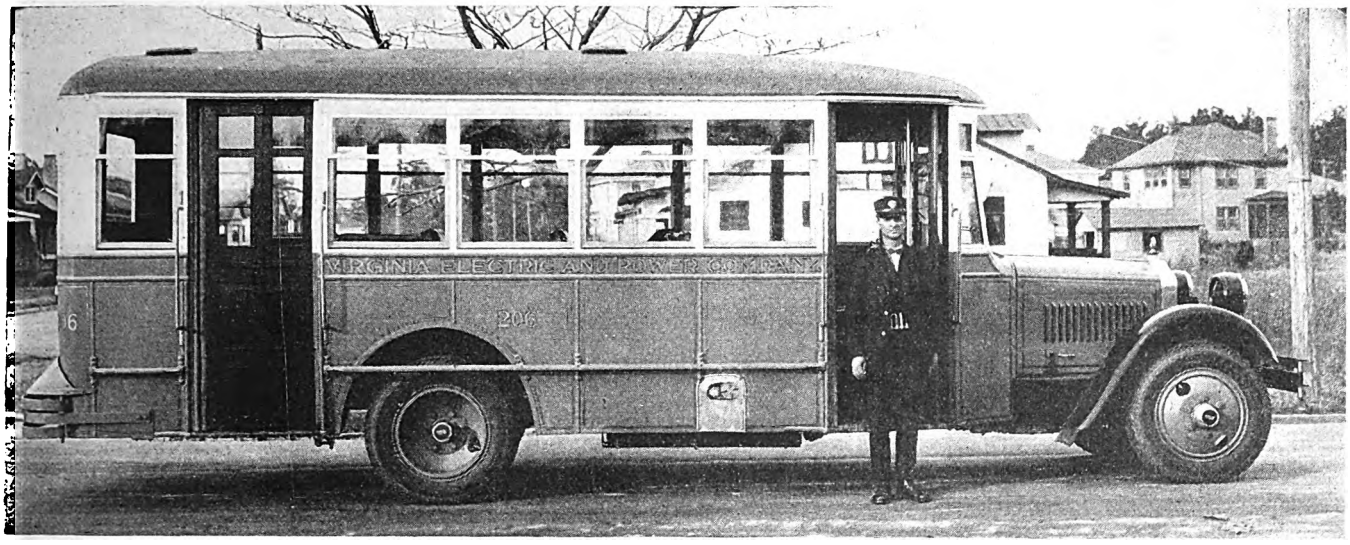
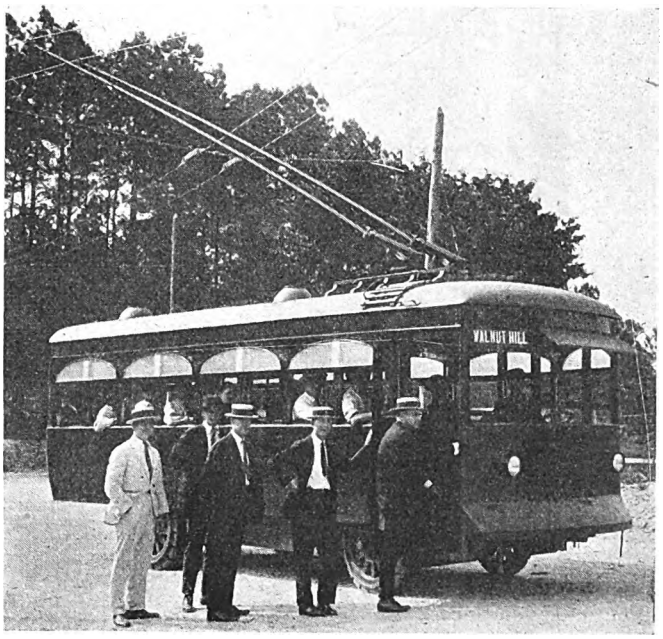


Buses of this type now furnish transportation on the route where trackless trolleys formerly operated in Petersburg, Va.

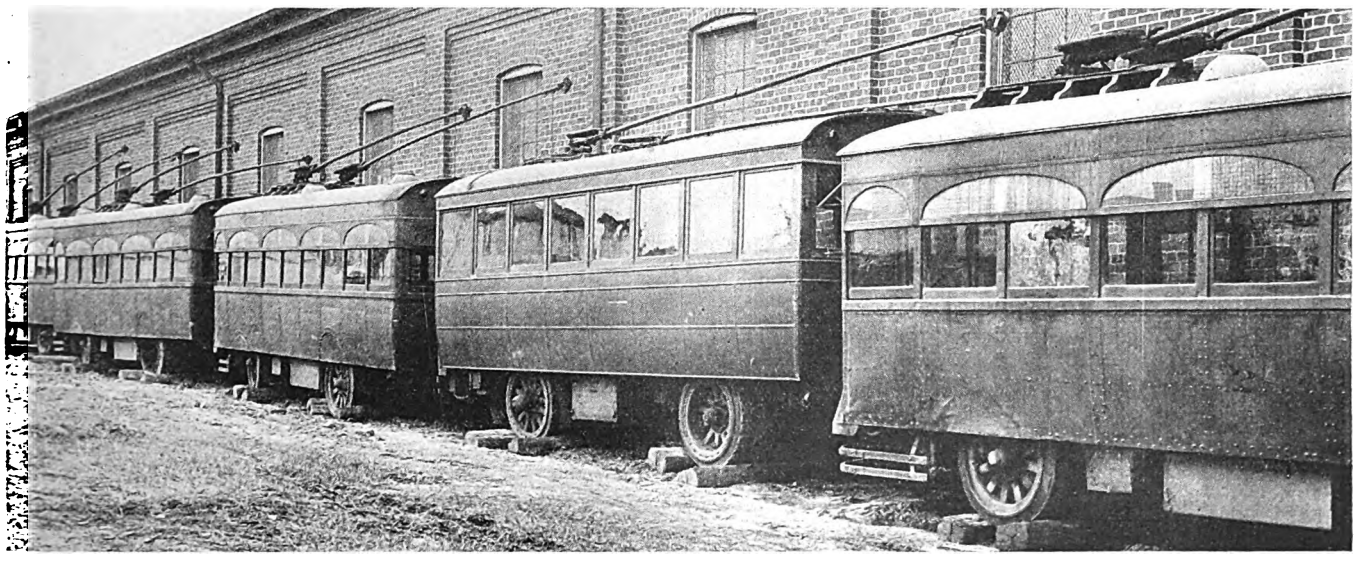
Bus Proves Superior to Trackless Trolley at Petersburg

FOLLOWING six months operation of gasoline motor buses in place of trackless trolleys in Petersburg, the Virginia Electric & Power Company is well satisfied with the new arrangement. The original trackless trolley installation in this district occurred in June, 1923, when an extension was made for a distance of 0.8 mile from the end of the car line in the fine residential suburb of Walnut Hills. Two vehicles were required to provide the service. During the latter part of 1924 the trackless trolley route was extended downtown and rail service between Petersburg and Walnut Hills was discontinued. Under this plan five trackless trolleys were operated on a route 3½ miles long. Rail operation was retained on about 10 miles of other routes in the Petersburg division of the company, then known as the Virginia Railway & Power Company.

The city of Petersburg, however, granted permission to operate trackless trolleys only under conditions that practically precluded any chance of their being success-



Type of trackless trolley formerly operated



Trackless trolleys laid up after being withdrawn from service in Petersburg, Va., Dec. 31, 1926

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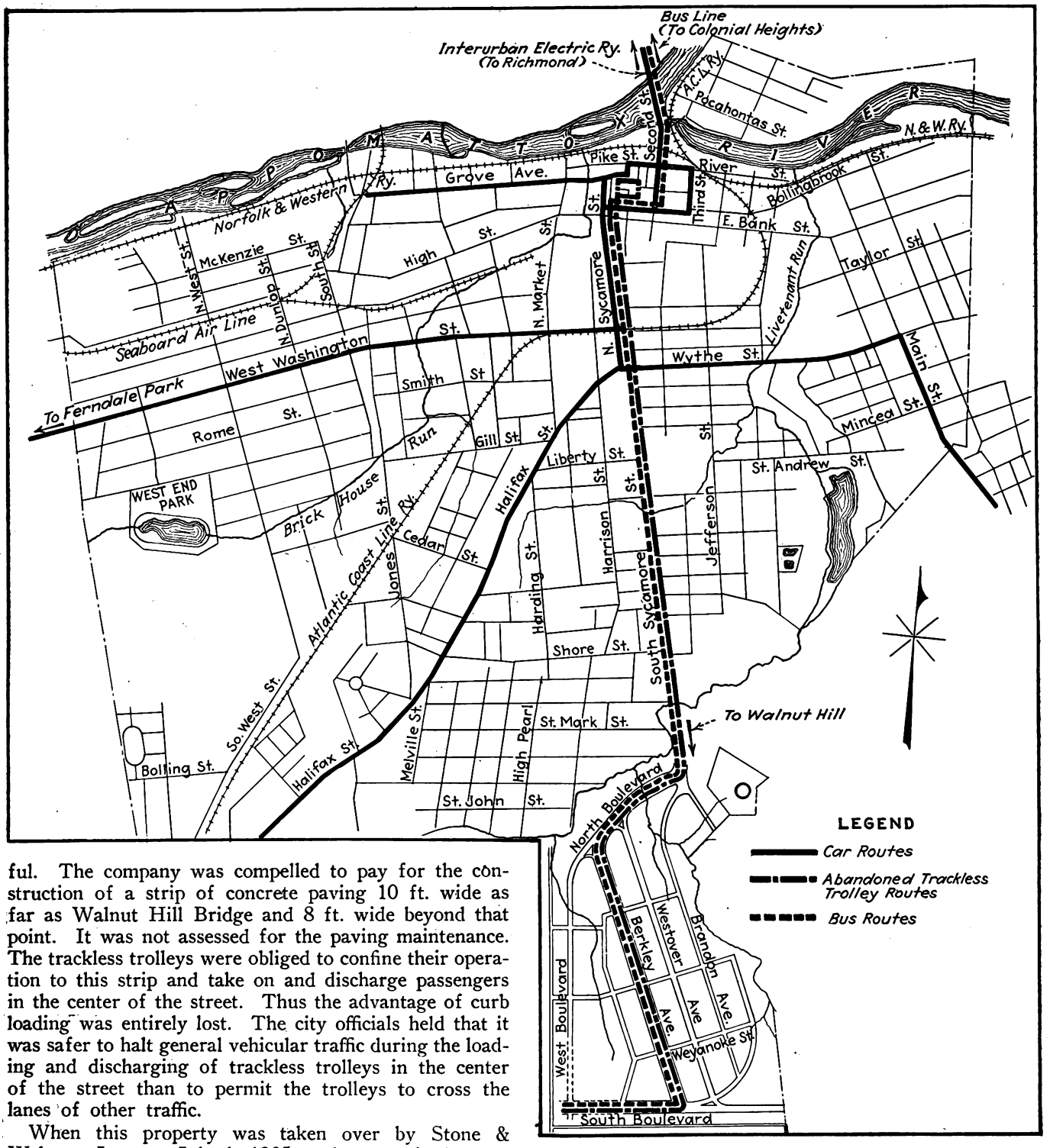

Transportation in the Petersburg district is now furnished on 10.4 miles of electric railway route and 4.4 miles of bus route, which replaces 3.5 miles of trackless trolley route

ful. The company was compelled to pay for the construction of a strip of concrete paving 10 ft. wide as far as Walnut Hill Bridge and 8 ft. wide beyond that point. It was not assessed for the paving maintenance. The trackless trolleys were obliged to confine their operation to this strip and take on and discharge passengers in the center of the street. Thus the advantage of curb loading was entirely lost. The city officials held that it was safer to halt general vehicular traffic during the loading and discharging of trackless trolleys in the center of the street than to permit the trolleys to cross the lanes of other traffic.

When this property was taken over by Stone & Webster, Inc., on July 1, 1925, and reorganized under the name of the Virginia Electric & Power Company, special efforts were made by the new management to improve public relations. It was apparent that one of the best things the company could do in the Petersburg district would be to eliminate the hard-riding trackless trolleys and take down the double overhead wires, which were disliked by the residents of Walnut Hills.

Operating expenses of the trackless trolleys were as high as those of gasoline buses. Since the former were not in use elsewhere on the property and their equipment was not standard, maintenance costs were high, whereas the gas buses were being used in large numbers in Richmond and their maintenance costs were comparatively low. Hence there was no economic reason to retain the trackless trolleys. They were withdrawn on Dec. 31, 1926, and gasoline buses commenced operation on Jan. 1 this year.

At the same time the route was extended to Colonial Heights, a suburb lying to the north of Petersburg. Route-miles now total 4.4 as compared with 3.5 for the old trackless trolleys. White 21-passenger buses, of the type that are shown in the illustration which appears on page 151 are used. Apparently the public, as well as the Virginia Electric & Power Company, is pleased with the new service.

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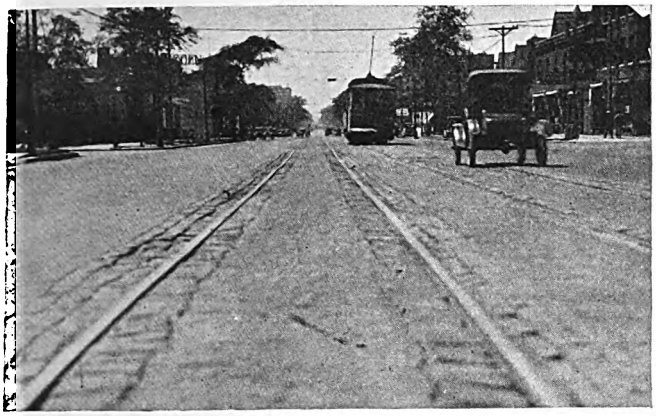


Before reconstruction the track of Jefferson Avenue, Detroit, was in bad condition

New 7-in., 93-lb. tee rail was laid in 1,500-ft. sections for a total of 2.5 miles of double track

Track Relaid Under Traffic

Reconstruction of 2.5 miles of double track on Jefferson Avenue, Detroit, was done in 1,500-ft. sections by the Department of Street Railways

By Del A. Smith

General Manager Department of Street Railways, City of Detroit, Mich.

FOLLOWING the theory that street railways can reduce materially the rubber-tired competition which has become so keen during the past few years by increasing the attractiveness and improving the riding qualities of the cars, the Department of Street Railways, city of Detroit, has undertaken the task of rehabilitating its rolling stock, track and roadbed. It is thought that newly painted and rejuvenated street cars, running smoothly over new rail, will attract again the patronage which they formerly enjoyed. Since the first of the year 275 cars have been repainted. It is expected that this number will be increased by 100 cars per month in the future. Our first track reconstruction job was on Jefferson Avenue, the principal east and west thoroughfare in the city and second only to Woodward Avenue as Detroit's most important artery of travel.

This undertaking embraces the replacement of rails and pavement from Woodward to Field Avenue (Belle Isle Park), a distance of 2.5 miles of double track. The old construction consisted of an 8-in. concrete foundation; oak ties, on a 1-in. sand cushion; 7-in., 91-lb. rail with cast welded joints, and brick and granite block pavement. The old foundation and ties, although having been in service for a period of nineteen years, were found in good condition and were retained. New 7-in., 93-lb. rail with thermit welded joints has been used and the old granite blocks and nose stones were relaid along the rail, the remaining area being paved with compressed concrete. This renewal work was started May 16 and was completed July 1, at a cost of approximately $200,000.

Because of the heavy traffic on Jefferson Avenue it was decided to carry on the work under traffic and without the use of temporary tracks, which would seriously interfere with vehicular movement. Many day and night shifts totaling approximately 350 men, the work progressed rapidly. Excavation was done by hand, the usable granite block and nose stone being piled back of the curbs and the refuse piled along the track, being loaded by crane on motor trucks during the day and on dump cars at night when the car service was infrequent. The work was done in sections of about 1,500 ft. of single track. Rails were laid on the pavement, just clear of the track, temporarily spiked to oak ties spaced about 20 ft., and tie rods inserted. Thermit welds were made and ground during the day. At night the old rail was removed by use of acetylene torch and crane and the new 1,500-ft. section of track slid into place. Rail-cut ties were adzed and the new track surfaced with oak blocking and steel shims. The latter were placed on the old oak ties and also on the concrete between ties. Thus the rail is thoroughly supported.

After all movement of the rail had been eliminated a 1:2:4 mix of concrete, using cement, sharp sand and No. 6 limestone, was poured to 1 in. above the base of

After the new rail was spiked and shimmed up a 1:2:4 mixture was poured to 1 in. above the ties

Compressed concrete pavement was laid between the rails with granite blocks forming a flangeway

Digitized by Google

rail and thoroughly tamped underneath. Then the old granite nose stones were relaid on a No. 6 stone cushion along the gage side and two rows of granite laid longitudinally along the outside of the rail. A 2-in. to 3-in. layer of crushed stone was then forked in the remaining space, flushed with a 1:2 mix of cement and sharp sand and rolled to form a compressed pavement. Grout for the granite block was furnished as a by-product of this operation. All vehicular traffic was kept off of the new pavement for five days, but street car movement was uninterrupted.

Fares Change with the Day

CHARGING of higher street railway fares for Sunday and holiday riding is quite common in Italy. In Rome, where most of the lines have a flat fare of 50 centesimi, the fare on Sunday is increased to 60 centesimi, and on two suburban lines where the regular fare is 80 centesimi the Sunday fare is 90 centesimi. These additional receipts so obtained are devoted to the city anti-tuberculosis fund. This plan, it might be said, is somewhat more practicable in Rome, where the tramways are municipally owned, than it would be with a private company.

The additional charge of 10 centesimi on Sunday is also followed in Florence, but the prize schedule of varied fares probably belongs to the Lido company. The Lido Tramway is the only one within Venice and its suburbs. It is, of course, not in Venice proper, which has only canals and boats for transportation, but connects the steamboat dock on Lido Island with the popular bathing beach there. The schedule of fares on this line is as follows:

LIDO TRAMWAY FARES

From October 1 to March 31	From April 1 to September 30
Normal days from 9 a.m. to 9 p.m. 40 centesimi	Normal days from 9 a.m. to 10 p.m. 50 centesimi
Sundays and holidays up to 9 p.m. 50 centesimi	Sundays and holidays up to 10 p.m. 60 centesimi
Sundays and holidays after 9 p.m. 70 centesimi	Sundays and holidays after 10 p.m. 70 centesimi

As no fare is scheduled after 9 p.m. in winter or after 10 p.m. in summer on ordinary days, presumably the cars stop at those hours, and those who wish to ride have to take a taxi or walk.

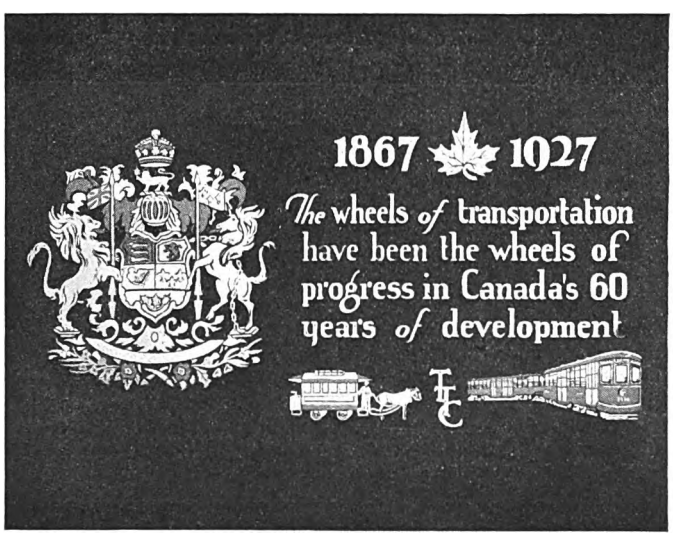
Montreal Benefit Members Get Assistance and Comfort

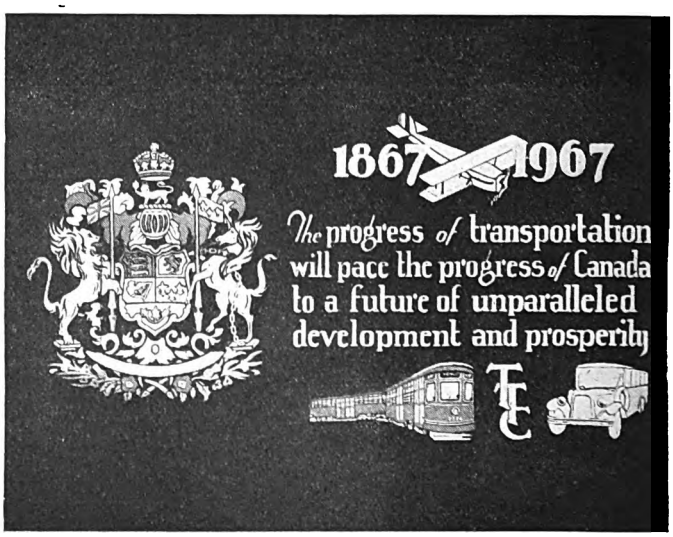
PLANS covering readjustment of benefits to be paid to members of the Mutual Benefit Association of the Montreal Tramways, Montreal, Que., worked out satisfactorily, according to the report of the association. During the year 32 applications for old age pension were received from men all eligible. The amount of $19,381 was paid to members on old age pension during the year; $6,426 was paid to members on permanent disability pension; $25,000 was paid in death benefits. During a similar period $42,445 was paid to disabled members, as compared with an amount of $13,417 paid in the previous year. The increase is due largely to the higher rate of benefits paid during this past year. In addition an insurance of $1,000 was provided for families of deceased members.

With regard to the allowance received from the Montreal Tramways covering the period from Jan. 1 to April 30, 1926, and amounting to $40,667, from which was deducted the expenses of management during that period, amounting to $6,764, leaving a net allowance of $33,903, it should be explained that this amount is over and above the allowances payable to the Benefit Association by the company for the fiscal year ended April 30, 1927. The balance transferred to reserve fund for the year was $105,132.

T.T.C. Celebrates Canada's Diamond Jubilee

DURING the first week in July Canada celebrated her Diamond Jubilee. During the week the Toronto Transportation Commission displayed a series of striking posters in its cars which indicated the place of transportation in Canada's growth. The posters were artistically painted in oil colors on a black background. The reproduction cannot show the striking contrast of the original. On one side appear the words "The wheels of transportation have been the wheels of progress in Canada's 60 years of development," while on the reverse appears the slogan, "The progress of transportation will pace the progress of Canada to a future of unparalleled development and prosperity."





Striking posters were displayed in the cars of the Toronto Transportation Commission to celebrate Canada's Diamond Jubilee

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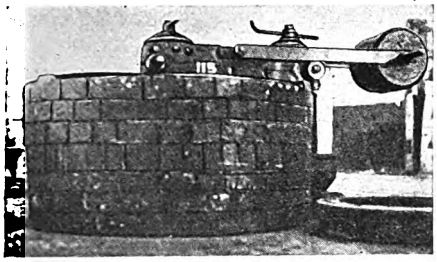
Maintenance Methods and Devices

Electrical Heating for Steel Tires

STEEL tires for car wheels of the underground electric railways, London, England, are heated by an electrical device so that they may be shrunk on the spiders at the company's Acton shops. Wire wound about a central iron core carries an alternating current. The tire slips over this core and itself forms the secondary circuit, thus making it a transformer. The induced current is sufficient to heat the tire to the required temperature, expanding it so that it may be slipped on the spider of the wheel. The primary circuit is automatically opened when this point is reached.

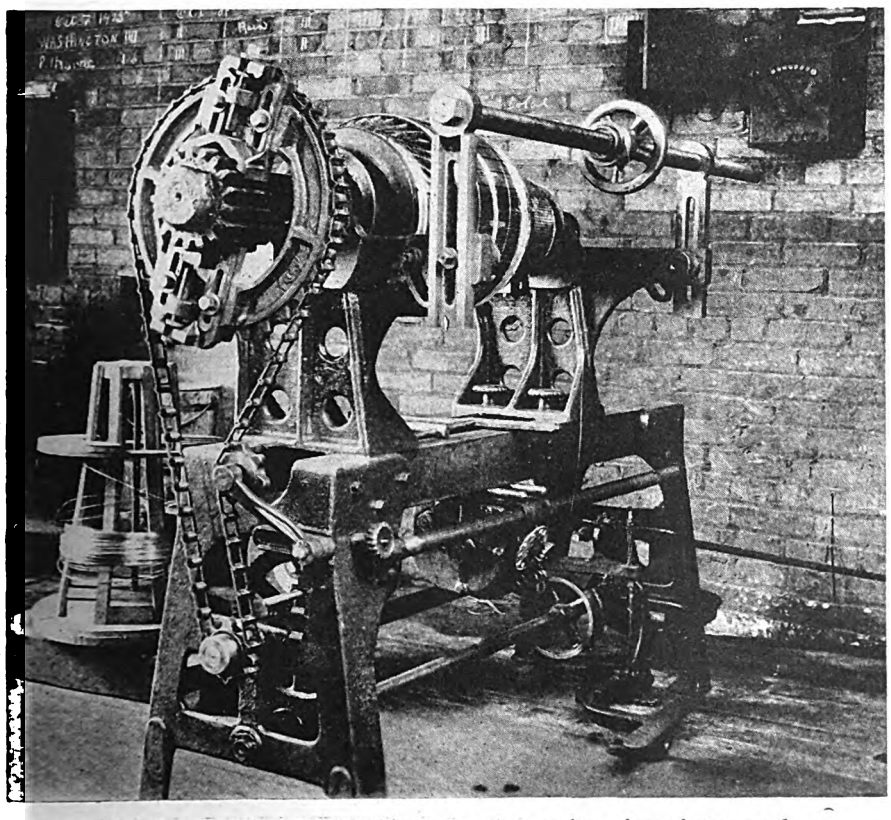


Tires of the London Underground are heated in this electric furnace for shrinking onto the wheels

The transformer is housed in the circular oven shown in the accompanying illustration. The lid, which is of steel, is fastened to the upper portion of the magnetic circuit. The whole is hinged to the outer vertical leg of the transformer and is balanced so that it may be raised easily when a tire is inserted or removed.

Banding Machine a Time Saver

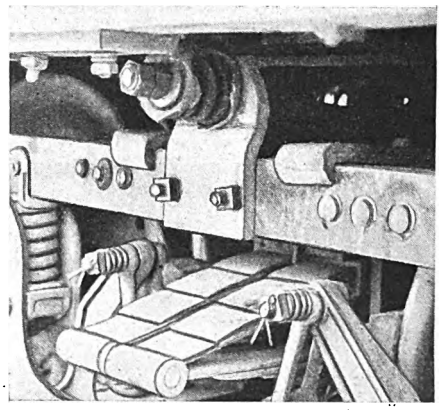
BANDING of a railway motor armature, which formerly took more than one-half hour's time of three men in the shops of the Grand Rapids Railway, Grand Rapids, Mich., now is done by one man in twenty minutes by use of a new Peerless type AP banding machine with improved tension device. The cost per armature is thus reduced from $2.45 to 24 cents. Besides the lower cost, the bands are tighter, so that armature troubles are reduced. With the old method there was an average of one broken or loose band per day. Now the only bands that are broken are caused by armatures which ground and cause the wire to burn off.



New armature banding machine saves time and produces better work

Spring Damper Replaces Friction Type

EXPERIMENTS are being conducted by the Oklahoma Railway, Oklahoma City, Okla., on a pair of type O-50 Standard trucks to obtain easier riding qualities by replacing the friction type damper on the swing bolster with two coil springs mounted on each side of the center plate. The spring, of 5/8-in. diameter steel, coiled to an outside diameter of 3 in. and approximately 4 in. in height, is carried on a 1-in. rod which is fastened to the center plate of the truck bolster. One of these rods is mounted on each side of the center plate.



Spring type of swing bolster damper applied to an O-50 Standard truck

One of these springs mounted on a 1-in. rod connecting with the center plate of the truck bolster is placed on each side of the truck frame. A tension of 10 lb. is applied to each spring when the bolster is in normal position.

A lug of 3/4-in. steel plate is fastened to the top side truck member. The rod from the center plate passes through a hole in this lug. The spring is on the outside of the lug and is drawn up against it by nut and lock-nut. A tension of about 10 lb. is applied to the spring when the truck and swing bolster are in normal position.

One of the older type cars has been equipped with trucks fitted with this

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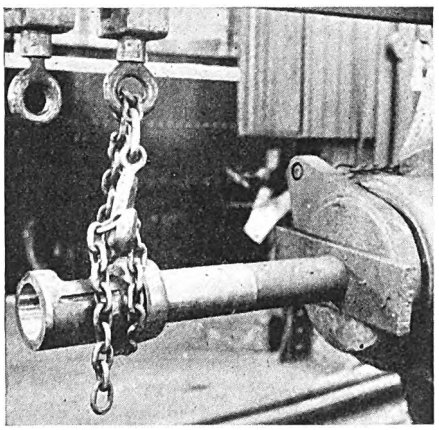
spring damper. It is the opinion of mechanical and transportation departments that the addition of the spring damper has improved materially the riding qualities of the car. Adaptation of the spring damper to other types of trucks will depend on satisfactory results from tests being made with this one car.

Armature Brasses Expanded on Wheel Press

BRASS armature bearings which have been removed from the shells of car motors of the Oklahoma Railway, Oklahoma City, Okla., for rebabbitting and whose outside diameters have become too small for a pressing fit into the shell are expanded in a wheel press by forcing a bar somewhat larger than the inside diameter through the brass. Four sizes of mandrels have been made for this expanding process. Usually it is necessary only to expand the brass from 0.005 to 0.010 in. to obtain the proper fit. However, in experiments conducted in the shops to determine to what extent the expanding may be carried, the diameter of one brass was



Armature bearings with worn outside surfaces are expanded on a wheel press by forcing a mandrel through the inside bore

An increase of 0.016 in. in diameter has been accomplished by this method. A chain hoist is holding the brass and mandrel at the tailstock end. In operation a fixture on the tailstock holds the brass while the mandrel is pressed through.

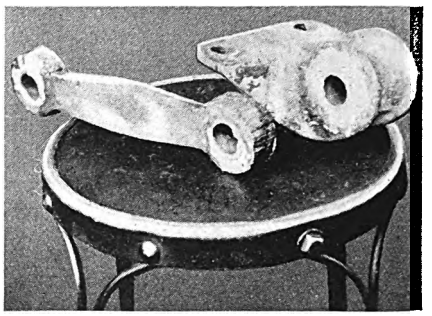
expanded 0.016 in. in one operation. It is felt that the shell can be expanded repeatedly until it is too thin to hold the babbitt lining.

In order that only a limited number of mandrels need be required for the variety of inside bores, the brass is poured with babbitt and bored to a size smaller than that of the mandrel to be used in expanding it. The difference in diameter between the bored brass and the mandrel is the amount the outside diameter is to be increased. Even with this additional work of pouring and boring the brass the reclaiming process is cheaper than installing new bearings.

The head of the mandrel is fastened in a chuck, which in turn is carried by the ram head of the wheel press. A suitable chuck that fits in the tailstock of the press holds the shell while the bar or mandrel is pressed through. Approximately 10 tons pressure will expand or stretch the brass 0.010 in.

Rattle Eliminated in Truck Hangers

BALL and socket swing bolster hangers originally used on various types of Brill trucks are rebuilt in the shops of the Dallas Railway & Terminal Company, Dallas, Tex., to eliminate the rattle prevalent when the ball and socket become badly worn. The bracket containing the socket is bored to take a length of 1¼-in. outside diameter steel tubing. The space between the tubing and the rim of the socket is filled in by electric welding. The link, originally having the ball at each end, is



Rebuilt link and bracket of ball and socket joint

flattened out and drilled to take a similar size piece of tubing. The ball and socket joint is thus replaced by a plain flat joint held together by a 1-in. bolt.

To eliminate the rattle which might develop after such a joint becomes worn a piece of 1⅜-in. x ⅛-in. spring steel is fastened at the middle of the link. Holes in the spring fit over the ends of the bolt, producing a pressure on the coupling at the joint. All of the spare and worn links and brackets on hand have been rebuilt and eventually all of the trucks will be equipped with the remodeled link. It is anticipated that as this new type of joint wears out it may be rebuilt by inserting a new piece of 1¼-in. steel tubing.

July 31 Is the Dead Line for Maintenance Competition

TO BE eligible for one of the capital prizes of $200, $100 and $50, material submitted in ELECTRIC RAILWAY JOURNAL'S maintenance competition must be mailed before Aug. 1, 1927.

This is the last week to send in material for the capital prizes. Those who have been putting off submitting their kinks should get busy at once. All material received will be turned over to the judges immediately after Aug. 1 for their consideration in awarding the capital prizes.

Prizes of $25 each will continue to be awarded each month until the end of April, 1928, and material for these may be submitted any time until then. Of course, every one is anxious to go after the big prizes, and that requires immediate action. If photographs of the device to be submitted are not available a rough sketch will be sufficient.

Here is a brief summary of the contest conditions:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated prior to Aug. 1, 1927. For the monthly prizes manuscripts will be received until April 30, 1928.
7. Illustration material may be in the form of drawings, sketches, blueprints, or photographs. All sheets should be marked "Maintenance Competition."
8. Details of the conditions not given above will be found in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

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American Association News

American Executive Committee

AS THE guests of Barron Collier aboard the delightful steam yacht *Florida*, the American Electric Railway Association executive committee took advantage of the cooling breezes of New York harbor by holding a busy all-day meeting devoted to heading up the work of the association for the year. Those in attendance included the following:

W. H. Sawyer, president; R. P. Stevens, J. H. Hanna, L. S. Storrs, F. R. Coates, L. E. Lippitt, C. B. Proctor, Daniel Durie, T. A. Kenney, M. B. Lambert, S. J. Cotsworth, H. L. Brown, E. B. Meissner, J. N. Shannahan, R. I. Todd, Edward Dana, E. C. Faber, C. B. Keyes, L. H. Palmer, H. B. Cobban, A. M. Hill, T. R. Langan, R. B. Stearns, T. A. Cross, F. W. Doolittle, Charles Gordon, J. W. Colton, F. C. J. Dell, G. C. Hecker, A. C. Meyer, E. J. Murphy, Labert St. Clair, L. C. Vickers, J. W. Welsh.

The general plan and character of the program being prepared for the annual convention in Cleveland was presented in some detail by H. L. Brown, chairman. In several respects this represents a considerable departure from previous convention programs. It is planned to use the luncheon conference method for the double purpose of covering a wide range of the most important industry problems, while at the same time bringing together in informal meetings the younger, as well as the better known, railway executives having interests in common.

On Tuesday there are to be six and on Wednesday eight of these luncheon conferences, making a total of fourteen for the two days. A sponsor will be appointed for each luncheon, to stimulate and direct the discussion, but there will be no formal addresses; the purpose of the meeting being to permit executives to compare notes and experiences and to get new ideas for the improvement of the situation on their respective properties. On Thursday one large luncheon conference is planned, which will be devoted entirely to the interurban situation and which is intended to bring together interurban executives for a discussion of their particular problems.

Outstanding Speakers Planned

Having provided through these luncheon conferences for the discussion of direct industry matters, attention will be given in the preparation of the program for the morning meetings of the American Association to the selection of capable speakers, mostly from outside the industry, who can suitably interpret subjects of broad interest to the industry as a whole. An effort is being made to obtain speakers of national reputation for this phase of the program. A feature of the Thursday morning program will be a symposium of five-minute discussions by men in the industry whose properties have made notable progress in the improvement of service, reduction of costs or stimulation of new business.

Plans for Entertainment at the Convention

Convention entertainment plans were reported by E. C. Faber, chairman. After having worked out a budget to cover the expense of providing the program contemplated, Mr. Faber's committee asked for an additional appropriation of $1,500, which was granted by the executive committee. The services of the Pittsburgh Railways Band and of the Cleveland Railway Male Chorus have been arranged for by the committee, so that an adequate musical program for concert entertainment and dancing are assured. A report from the exhibit committee, presented by F. C. J. Dell, showed a substantial increase in space sales over the corresponding period of last year. Periodic reports of the progress in the sale of exhibit space have been published in the JOURNAL over a period of several weeks.

J. H. Hanna, chairman, reported for the publications committee. Since the last meeting of the executive committee, the publications committee has been organized and has decided upon November 1, 1927, as the date for the first issue of *Aera* in its new form without advertising. Mr. Hanna said that the terms of the agreement to be made for the publication of *Aera* without advertising at no increased cost to the association, in accordance with the recommendations of the policy committee and the action of the executive committee at its last meeting, were discussed and outlined by the publications committee and are to be prepared in tentative form so that they can be sent to the committee members for additional suggestions and comments.

Training for Conference Leaders at Cleveland

Edward Dana, chairman of the educational committee, reported that arrangements are proceeding for holding a group conference leader training course during the Cleveland convention. The committee plans to get out circulars calling attention to these courses and urging railway executives to send men qualified for group conference leadership to take the training under Dr. Cushman's direction.

A report of the special committee appointed at the last executive committee meeting to look into the matter of recent developments in car and truck design was made by its chairman, M. B. Lambert. The committee found that the new designs of equipment are being brought out conservatively, and that in each instance manufacturers and operators interested in these new designs are proceeding on an experimental basis, and are showing no tendency toward either the promotion or the application of radical departures from conventional practice without taking steps to assure adequate tests of the new designs. The report was received and placed on file. On motion of Mr. Lambert, the matter of new car development was referred to the Engineering Association with instructions that the subject be studied by it and a report prepared through the committee on unification of car design.

New Constitution Ready

Final changes recommended in the new draft of the constitution and by-laws of the association were read by H. L. Brown, reporting for the committee. The new constitution is now in final shape for submission to the convention. L. C. Vickers, for the committee on taxation, said that effort is

COMING MEETINGS OF *Electric Railway and Allied Associations*

***July 27-29*—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Biltmore Hotel, Atlanta, Ga.**

***Aug. 4*—New England Street Railway Club, Annual Outing, Whalom Park, Fitchburg, Mass.**

***Aug. 18-19*—Wisconsin Utilities Association, Transportation Section annual convention, Hotel Pfister, Milwaukee, Wis.**

***Sept. 1-4*—Tenth Annual Conference on Human Relations in Industry, Silver Bay on Lake George, N. Y.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, South Bend, Ind.**

***Sept. 13-15*—International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting. Book-Cadillac Hotel, Detroit, Mich.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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being devoted at the present time toward securing a reduction in corporation income taxes to take advantage of the present large surplus in national tax income. The attention of the committee is also being centered actively on proposed tax legislation in various states. In some instances there have developed a large number of bills affecting utility taxes.

Resolutions on the death of General Guy E. Tripp were adopted by the executive committee, and it was decided to send copies of this resolution to General Tripp's family and his company.

A report for the convention hotel committee was made by G. C. Hecker of the association staff. A total of 3,312 rooms are available at Cleveland for convention delegates. Of these 1,214 had been requisitioned up to July 10. Although this represents only slightly more than one-third of the total rooms available, the facilities in the Cleveland and Hollenden hotels have been practically exhausted by reservations already made.

In the absence of T. W. Casey, chairman, M. B. Lambert reported for the convention special manufacturers' committee, to which had been referred the matter of the printing of registration lists. This committee recommended printing a bound cumulative booklet of registrations, and it was thereupon decided to provide such a booklet at the Cleveland convention.

H. B. Cobban, president Midwest Electric Railway Association; A. M. Hill, president Public Utilities Association of West Virginia; T. R. Langan, president Metropolitan Community Section, and R. B. Stearns, president New England Street Railway Club, were present at the meeting as representatives of sectional and state associations and were introduced in turn by President Sawyer. A. M. Hill, who is also chairman of the Motor Bus Division, American Automobile Association, said that the directors of his organization were planning to hold a meeting in Cleveland on Tuesday of convention week. As a measure of co-operation the secretary was instructed to work out some arrangement for admission of A.A.A. bus division members to the association's exhibit during convention week.

Affiliated Associations Have Work Organized

Progress in the work of the affiliated associations was reported by their respective presidents. Daniel Durie, president of the Engineering Association, outlined a new plan of holding simultaneous meetings of the four different engineering groups for the presentation of reports, so as to leave two complete days of the convention free for addresses and discussions. Mr. Lippitt for the accountants, and Mr. Proctor, for the Claims Association, reported that their programs are well outlined and that they anticipate an interesting and profitable series of meetings. Both Mr. Lippitt and Mr. Proctor requested the co-operation of President Sawyer in urging executives of railway properties to permit accountants and claims men to attend the convention so as to take part in the programs of their respective associations.

Following the completion of routine business a number of points were brought up suggesting matters which need the attention of railway men. R. B. Stearns, president Eastern Massachusetts Street Railway and president of the New England Street Railway Club, commented on the laxity of street railway men toward the activities of their state committees on public utility information. It was suggested in this connection that much greater co-operation by railway men is needed for getting the information prepared by the state committees into the columns of local newspapers.

The next meeting of the executive committee was set for Aug. 26 in Cleveland.

Engineering Executive Committee

CONSIDERATION of the program for the Cleveland convention and review of committee reports were the principal items taken up at a meeting of the executive committee of the Engineering Association held at association headquarters, New York City, on July 18. Those present were President Daniel Durie, R. H. Dalgleish, W. F. Graves, P. V. C. See, L. D. Bale, W. W. Wysor, A. T. Clark and H. H. George.

On account of the expansion of the activities of the Engineering Association and the desire to hold to a minimum the discussion of committee reports on the floor at the annual meeting, it is planned to devote the Monday and Thursday sessions at the convention to general topics, including addresses and discussions. The Tuesday meeting will be divided into four parallel sessions, the principal topics at these being rolling stock, way and structures, power, and purchases and stores. In order to work out the details of the program the chair appointed a committee consisting of Messrs. Bale, Wysor, See, Clark, George and McVittie.

The committee on Engineering Manual reported through Mr. Hecker that the distribution of the 1926 edition has progressed satisfactorily. Attention was called to an error on page 572 in the drawing of the limit of wear gage, which should be for the high flange instead of the low flange. It was agreed that a new page making the proper correction should be prepared and sent out.

Reports of the various committees on the year's work were reviewed briefly. These will be prepared for publication and distributed prior to the convention, according to the usual procedure.

The appointments of judges in the Electric Railway Journal Maintenance Men's Contest, who were appointed some time ago by President Durie, were confirmed. These are A. T. Clark, F. McVittie, H. H. George, G. C. Hecker and Charles Gordon.

The report of the committee on nominations, selecting names for officers for the coming year, was received and approved. The list of nominations was published in Electric Railway Journal for July 9, page 73.

It is planned to have the next meeting of the executive committee at Cleveland on Saturday or Sunday immediately preceding the convention.

Claims Executive Committee

MEMBERS of the executive committee of the Claims Association held a meeting at association headquarters on July 16. Those present were President C. B. Proctor, C. E. Redfern, E. N. Muldoon representing G. T. Hellmuth, and E. L. Lindemuth of the executive committee; committee chairmen W. F. Weh, W. M. Holtz and H. K. Bennett. G. C. Hecker acted as secretary.

In the minutes the secretary called attention to the action taken last October, that reports of committees and speeches to be delivered at the convention will not be printed and distributed in advance this year.

William G. Marshall, chairman of the committee on employment, sent a letter stating that on account of lack of duties it was recommended that his committee be disbanded. After discussion it was voted to take action to that effect.

Reporting for Chairman Hellmuth, Mr. Muldoon stated that the report of the committee on bonus and award systems will not be ready until early in September. It will then be distributed to the members of the executive committee for review.

Mr. Bennett presented the report of the committee on traffic and safety. This report, he said, had been reviewed by the executive committee of the Transportation & Traffic Association. It was approved by the Claims executive committee.

The report of the medical and surgical committee was presented by Dr. Holtz. This was approved with the suggestion that some well-planned action be taken to stimulate greater interest in the work of this committee.

Attention was called by the president to the letter from Executive Secretary J. W. Welsh advising of the desire of the American executive committee to have an editing committee of each of the affiliated associations which would eliminate extraneous matter so as to reduce the bulk and the expense of printing the proceedings. It was agreed that this year's reports would be reviewed by Mr. Weh. The appointment of an editing committee was referred to the next administration.

Mr. Weh presented the report of the program committee. It was proposed to have the Monday session devoted to papers and prepared discussion. Tuesday's session would be a joint session with the Transportation & Traffic Association, while on Thursday there would be a symposium on claims subjects, followed by papers on medical and surgical work. The report was tentatively approved subject to such modifications as the chairman of the committee might

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find it necessary or desirable to make.

The date of the next meeting was set for either Saturday, Oct. 1, or Sunday, Oct. 2, at the discretion of the president.

Entertainment

DEFINITE plans for the entertainment of delegates and guests at the American Electric Railway Association convention to be held at Cleveland, Oct. 3 to 5, were completed at the second meeting of the entertainment committee held in Cleveland on Monday, July 11. Sub-committees appointed at the previous meeting reported on each item of entertainment and for each period of the convention week.

The continued growth of the electric railway conventions was recognized by the committee and more extensive plans were developed accordingly. An unusual feature of this year's convention occasioned by the opening of the convention on Saturday noon required the provision of musical features for both Saturday and Sunday immediately prior to the week of meeting.

On Monday night will be held the usual reception of officers of the association, followed by dancing. Tuesday evening will be devoted to the Advisory Council and the program that it is now developing. Wednesday evening there will be a theater party at the Keith Theater, and the entire house will be engaged for the members and guests of the association, following a plan similar to that which was mapped out for last year, but which unfortunately was not carried out due to the untimely death of John Stanley. This leaves the convention buildings free for lay visitors to view the exhibits. It was also thought advisable to have one evening's entertainment planned away from the exhibition halls. Thursday evening will be devoted to a grand ball, with many excellent features planned in addition.

A special drive is being made to increase the attendance of ladies and special plans are being developed for their entertainment. Besides receptions at the Auditorium on Sunday and Monday afternoon, at which musical programs and refreshments will be provided, there will be a luncheon at the Acasia Country Club on Tuesday, preceded and followed by bus drives through Cleveland parks and residential districts. A bridge party with many attractive prizes is planned for Thursday, and in addition a number of other events will be offered for the entertainment of the visiting ladies of the convention.

At the meeting Edwin C. Faber presided as chairman. Other members of the committee present were T. O. Kennedy, Joseph H. Alexander, L. J. De Lamarter, John A. Dewhurst, R. W. Emerson, T. A. Ferneding, A. H. Ferrandou, F. V. Gantt, C. D. Porter, J. B. Stewart, Jr., H. B. Weatherwax, E. F. Wickwire, F. H. Wilson, P. E. Wilson, Leslie Paul representing Karl A. Simmon, J. E. Lytle representing C. L. Van Auken, J. W. Welsh, and Fred B. Bullock.

New Association Memberships

MEMBERSHIP in the American Electric Railway Association was voted by the executive committee at its meeting held on July 15 to one operating company, one associate, 25 manufacturers and ten individuals. A list of the new company members follows:

OPERATING COMPANY

Canadian National Railways, Montreal, Que., Canada.

ASSOCIATE

Miller-Schorn Rapid Transit System, consulting engineers, Detroit, Mich.

MANUFACTURER COMPANIES

American Brake Materials Corporation, Detroit, Mich.

American Hammered Piston Ring Company, Baltimore, Md.

Blackhawk Manufacturing Company, Milwaukee, Wis.

Bonney Forge & Tool Works, Allentown, Pa.

S. F. Bowser & Company, Inc., Fort Wayne, Ind.

The Carborundum Company, Niagara Falls, N. Y.

Elite Manufacturing Company, Ashland, Ohio.

Federal-Mogul Corporation, Detroit, Mich.

J. B. Ford Company, Wyandotte, Mich.

General Metals Company, Inc., Philadelphia, Pa.

Illinois Motive Equipment Company, Chicago, Ill.

David Lupton's Sons Company, Philadelphia, Pa.

Mather Spring Company, Toledo, Ohio.

Motor Wheel Corporation, Lansing, Mich.

Oil Jack Company, Inc., New York, N. Y.

Safety Equipment Service Company, Cleveland, Ohio.

Steel Wheels, Inc., Newark, N. J.

Stevens Walden-Worcester, Inc., Worcester, Mass.

Van Norman Machine Tool Company, Springfield, Mass.

Vlchek Tool Company, Cleveland, Ohio.

Wadell Engineering Company, Newark, N. J.

Walker Manufacturing Company, Racine, Wis.

Weaver Manufacturing Company, Springfield, Ill.

Wilkening Manufacturing Company, Chicago, Ill.

Zenith - Detroit Corporation, Detroit, Mich.

News of Other Associations

New England Outing Aug. 4

SOME 300 members of the New England Street Railway Club are expected to attend the annual outing of the organization, which will be held this year on Aug. 4, at Whalom Park, on the outskirts of Fitchburg, Mass. An all-day program, which will include sports and other forms of entertainment, is being arranged by John Belling, secretary, and members of the entertainment committee. The club will devote part of the afternoon entirely to water sports. There will also be a ball game. Lunch will be served at noon at Whalom Inn and in the evening there will be a dinner.

Silver Bay Conference Announced

FINAL arrangements have been made and the program announced for the tenth annual conference on Human Relations in Industry. The conference will be held at Silver Bay on Lake George, N. Y., under the auspices of the industrial department of the Young Men's Christian Association. The meeting will be Sept. 1-4. As in past years, the program will include addresses on such topics as the responsibilities of modern business, improving industrial relations and better citizenship of the worker.

During the week of Aug. 25 to Sept. 1 the foreman leadership course will be held under the instruction of Arthur L. Mann, industrial extension division, New York State Department of Education.

Those desiring to attend should make arrangements with Fred H. Rindge, Jr., executive secretary, 347 Madison Avenue, New York City.

Two International Associations to Consolidate

AT THE fourth annual convention of the Internationaler Strassenbahn- und Kleinbahn Verein, held in Copenhagen, June 22-24, it was voted unanimously to combine with the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles. This action was taken on the invitation of the latter association. The union will result in a return to the conditions existing before the war, when there was only one association representing all of the local transportation companies in western and in central Europe. The headquarters of the consolidated association will be, as formerly, in Brussels, and the Internationaler Strassenbahn- und Kleinbahn Verein will pass out of existence.

To facilitate the consolidation the union agreed to make several changes in its constitution. One of these is that the proceedings, instead of being in French only, will now be conducted and printed in both French and German, and the executive committee is empowered to authorize the use of other languages also. Another change to be made in the constitution to effect the consolidation is to increase the size of the executive committee. The clause in the present constitution which provides that the members shall be at least ten and not more than twenty will be changed to read "not less than twenty nor more than twenty-five." It is proposed to add immediately six more members, of whom four will be from Germany, one from Austria and one from Hungary. It has also been agreed that at the time of the next vacancy among the vice-presidents, the post shall be filled by a representative from Germany.

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News of the Industry

Duluth Company Not Required to Pave

The Minnesota Supreme Court at St. Paul, Minn., on July 15 handed down a decision in the appeal by the city of Duluth, with the Duluth Street Railway as respondent, affirming the lower court's decision that the company's franchise does not compel it to pave or repave streets, but does make the company responsible for additional paving expense incurred because of its operation. The city charged the company $40,000 and its share in paving two streets and brought action to recover when the company refused payment. The District Court awarded the city $7,000 as the company's share of the paving cost because of its operation on the two streets.

In reaching the decision the court stated that the defendant's franchise duty with respect to paving applies "in case" the city of Duluth "shall at any time pave or otherwise improve the surface of any street along which said railway may run." That language refers to any repaving as well as to the first paving of the street occupied by defendant's tracks.

Under a franchise imposing the duty on a railway company, whenever a street is paved or otherwise improved, "to pay only so much of the expense of paving the street as is made extra by reason of said railway," there is no duty to pay the whole cost of repaving solely because another section of the franchise imposes a duty to keep the intertrack space in "proper repair."

Chicago Surface Lines Franchise Extended for Four Months

In order to allow time to work out an agreement for the permanent settlement of the Chicago railway problems, an ordinance was passed on July 13 by the City Council extending for a period of four months the present day-to-day franchise under which the Chicago Surface Lines have been operating since their twenty-year franchise expired on Feb. 1.

Application for a grant of six months was filed with Corporation Counsel Ettelson recently by Leonard A. Busby, president of the Chicago City Railway, but at the suggestion of Mayor Thompson an extension for only four months was voted. The new extension is similar to the present one, which expires on July 31, with both parties qualified to terminate the agreement on 30 days notice. The operating agreement between the various component lines for exchange of transfers is to be continued. Before the extension can be accepted by the receivers of the Chicago Railways, however, it is understood that the agreement will have to be reviewed by the federal courts.

Many of the Chicago Aldermen have indicated a desire to work through the summer in order to have some form of ordinance ready to submit in the fall to the special session which Governor Small has virtually promised to call if the city and companies can agree on the legislation required.

As a basis for these negotiations between the transportation companies and the city, the five railway bills which failed of passage at the last session of the General Assembly are to be brought up at the new conferences.

The chief point of controversy at local transportation committee meetings during the past week has been the question of whether, as suggested by Governor Small, the new ordinance should be drafted first and be submitted to a referendum before enabling legislation is sought, or whether action should be deferred until after the legislation is obtained.

Hearing on Fare Increase in Atlanta

P. S. Arkwright, president of the Georgia Power Company, reveals figures showing losses sustained by railway operation—Opposition claims many concessions have been made to company

FOLLOWING a hearing on the question of revised rates charged by the Georgia Power Company in Atlanta, the Georgia Public Service Commission is considering whether or not an increase in fares will be allowed and, if so, how much of an increase will be permitted. President Arkwright of the power company defended the proposed increase, while the opposition was led by James L. Mayson, city attorney.

In his evidence Mr. Arkwright pointed out that in the period between 1920 and 1926 the railway department of the power company had failed by more than $7,000,000 to make the 8 per cent allowed by the commission. The gross revenue of the department, he stated, was $5,256,000 in 1926, compared with $2,900,000 in 1914, but operating expenses increased from $1,966,000 to $4,000,703 and net earnings had decreased from $933,000 in 1914 to $552,000 in 1926, despite economies in equipment and operation.

From 1914 to 1921 earnings of the department, according to Mr. Arkwright, averaged 4.6 per cent. In 1922 they were 3.2 per cent on the investment; in 1923, 2.9 per cent; in 1924, 2.2 per cent, and in 1925—the year of heavy and unregulated jitney competition—1.3 per cent. In 1926, with jitneys under control and recommendations of J. A. Beeler in effect, earnings of the department rose to 2.2 per cent.

The principal grounds contained in the opposition voiced by City Attorney James L. Mayson were that on the basis of its own valuation of $78,510,000 the earnings of the Georgia Power Company were $8,401,699, or approximately 13 per cent; that the power company's methods in dividing its property and showing a loss in one department, while others showed profits, was "unnatural and unfair"; that the city had already made many concessions to the company in eliminating jitney competition, allowing the use of one-man cars, and so on, and that these should have permitted the necessary return on the investment, and that the 5-cent fare for school children recommended in the Beeler report had not been granted. In short, Mr. Mayson urged that the present rates be maintained for fares in Atlanta and that a 5-cent fare be provided instead of a 7-cent fare for school children.

The company's petition, filed on May 30, asks that the cash fare be made 10 cents instead of 7 cents as at present, and tickets be sold at the rate of three for 25 cents, instead of at the rate of three for 20 cents as at present.

In a statement issued at the time the petition was filed, P. S. Arkwright, president, declared that despite the fact that the railway system had not earned a fair return on the fair valuation of its properties, it had gone about giving Atlanta the best possible service.

He said that millions of dollars had been poured into a losing property on the principle that the best way to earn the support of the public was to give it a service second to none. The public is willing to support a modern, up-to-date transportation service, Mr. Arkwright stated, and to that end everything humanly possible had been done to provide good service first. Many new street cars had been added, more track laid, service interruptions cut down to a minimum, schedules speeded up and many other improvements made.

Whether or not the readjustment is allowed depends upon the commission. It is expected that hearings will last several days, and that the commission will take the matter under advisement before rendering its decision.

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City Control Suggested by Jacksonville Committee

City control of the Jacksonville Traction Company, Jacksonville, Fla., was suggested in the proposed franchise submitted by the citizens' traction committee to the laws and rules committee of the City Council on July 15. The proposed franchise was referred back to a sub-committee for redrafting with no major changes and will be resubmitted later.

The provisions of the proposed franchise, however, were outlined and brought before the City Council for temporary consideration. The purpose of the proposed franchise is to enable the city to procure an adequate and efficient system of transportation and at the same time to enable the company to earn a reasonable return upon the property owned by it and used for transportation purposes. One of the provisions of the franchise would create the position of traction director, who would be appointed by the City Commission and who would have full control of all of the railway's affairs. The draft provides that the company shall be allowed to earn 8 per cent on a valuation fixed by agreement between the city and the company and establishes the franchise for a term of 30 years, subject to renewal at any time. The company would be required to pay for paving between its rails and also to pay a 3 per cent franchise tax, provided this tax is earned over the allowed 8 per cent.

Three important features of the ordinance still unsettled are the value of the company's property, the proper method of account for depreciation and the matter of extensions and additions.

The franchise, to become effective, must be adopted by the Council and submitted to the voters of Jacksonville and ratified by them. Also, the company must exhibit its financial ability to comply with the terms of the franchise.

Appoint Arbiters; Ask Federal Court's Approval in Chicago

Threats of a strike in Chicago were definitely removed on July 19, when James M. Sheean, attorney for the Chicago Surface Lines, appeared before Federal Judge James H. Wilkerson to obtain approval of the arbitration plan previously agreed upon by a wage conference sub-committee composed of three officials of the street car men's union and three Surface Lines representatives. The chief points in the wage dispute which will be submitted to arbitration are demands of the platform men for an increase of 15 cents an hour, a $1,000 free life insurance policy and a $20 a week sick benefit, together with the counter demand of the companies for a wage reduction of 5 cents an hour. It is understood that the demand of the companies for a change in the working day from eight to nine hours to avoid excessive payments of time and a half for overtime will not be submitted as an issue in the arbitration proceedings.

Due to the fact that more than half of the Surface Lines' property is involved in federal receivership, arbitration of these questions must await an approving order by Judge Wilkerson.

Selection of Circuit Judge Keckham Scanlan to represent the Surface Lines employees on the Board of Arbitration and E. J. McIlraith, staff engineer of the system, to represent the companies was announced at the conclusion of negotiations on the same day the plan was presented to Judge Wilkerson. These two men are expected to meet soon and choose a third and disinterested member of the board.

In the parallel negotiations between Chicago Rapid Transit Company executives and employees, concerning demands of the latter for a 5-cent hourly wage increase, current developments indicate that the same form of arbitration as worked out by the Surface Lines operators and employees will be adopted.

Reaching an apparent deadlock with company officials in their demand for a raise of 15 cents an hour over the present 75-cent scale and changes in working rules, trainmen of the Chicago, Aurora & Elgin Railroad voted on July 18 to authorize heads of their union to call a strike in the event their negotiations proved unavailing.

Albee Asks Vaudeville Actors Not to Make "Cheap" Jokes

Edward F. Albee, president of the Keith-Albee Theaters, in a special letter to vaudeville actors playing his circuit, said that he did not regard a derogatory comment about local street car service as either funny or entertaining and that he did regard it as injurious both to transportation lines and theaters. Mr. Albee's letter follows:

> I have had a number of complaints from the president and other officials of different street car lines in cities where vaudeville people play complaining that vaudeville artists have on many occasions referred in a derogatory way to street car lines, some artists going so far as to make cheap jokes of the same. I feel that this is not comedy or entertainment, but a direct injury both to the street railways and to the theater where the vaudeville artists are working. For without the street cars, I can't conceive how our patrons could reach our theaters. All of our patrons don't own automobiles.
>
> I feel that the artists do this thoughtlessly, and I am prompted to call their attention to it in the interest of the vaudeville theaters as well as the railways. Our theaters are not places for criticism from our stages, but for entertainment, and I trust, in the future, artists will refrain from using cheap jokes, not only in reference to street car companies but to any other industry or officials of our nation, state or city.

Formal Celebration Marks Opening of Grand Rapids Line

A big celebration has been planned to mark the official opening of the United Suburban Railway, successor to the Grand Rapids, Holland & Chicago Railway, which recently was sold under the hammer. The United Suburban will operate the line from Grand Rapids to Jenison, Mich., a distance of about 8 miles, having recently incorporated for $50,000, all paid in. The stock is held by residents in the different communities to be served.

For the opening on Saturday, July 23, the company has adopted the slogan: "Leave your automobile at home and ride the interurban."

The program for the formal opening calls for the festivities to start at 1 p.m., when a special car will leave Grandville carrying company officials, members of the entertainment committee and the Grandville Boys' band of 25 pieces. The car will run to Grand Rapids, where speakers of the day and invited guests, city officials and electric railway men will be taken on board at the Michigan Railway Company's station and the return trip begun. At 2 p.m. the Grandville celebration will start. All patrons will be given tickets, when fares are paid, entitling them to lunch. Saturday night there will be a fireworks display at Grandville.

Car service was begun on the line July 20. The schedule has been arranged so that the last car will leave Grand Rapids at midnight and the last car will leave Jenison at 11:30 p.m. The later cars are intended for the accommodation of theatergoers and others. The balance of the schedule will provide for a fifteen-minute service during the rush hours and half-hourly service during the remainder of the day.

Amalgamated Seeks to Re-enter New York City

Leaders of the Amalgamated Association have attacked the legality of the contracts of the Interborough Rapid Transit Company with its men and continue to try to induce men in the Interborough Brotherhood to join their union. The Amalgamated is seeking to regain a foothold in the New York rapid transit lines. In support of its attempt to enter, the Amalgamated has threatened to invoke court action attacking the legality of the Interborough's contracts with its men on the ground that they were "signed under duress." The contracts which the company claims 95 per cent of its men have signed guarantee two years employment unless that employment is terminated by mutual consent, with a provision against their joining any outside labor organization. Union leaders assert that having done everything in their power to arrange an amicable settlement and having received no reply to requests for a conference, they are at liberty to call a strike.

Frank Hedley, president of the Interborough, said that the principal reason

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against recognition was that the brotherhood insisted that all employees be members if they wished employment. Mr. Hedley cited the case of the 1916 strike, when members of the Amalgamated assaulted many loyal workers of the Interborough, and stated that he would be guilty of committing a great "blunder" to consent to his men joining the Amalgamated.

Leaders of the union in answer to Mr. Hedley's statements declared that his claim that 95 per cent of his men had signed the contracts was absurd.

It is probable that the State Industrial Survey Commission may decide to inquire into the situation.

R. M. Feustel to Help St. Louis Draft New Franchise

Robert M. Feustel, Fort Wayne, Ind., has been asked by Mayor Victor J. Miller of St. Louis, Mo., to help draft a franchise on the service-at-cost plan to be submitted later to officials of the St. Louis Public Service Company, which plans to buy the properties of the United Railways at foreclosure on Aug. 1. Mr. Feustel was a witness for the United Railways in the recent hearings before the Missouri Public Service Commission on the application of Receiver Wells for a higher fare, and in support of Mr. Wells' claims for a rate-base valuation "in excess of $75,000,000."

Mayor Miller will make no attempt to include either a rate-base valuation or the rate of return the company shall be permitted to earn, since the Missouri Supreme Court in a recent decision held that the Public Service Commission alone has jurisdiction over such matters. However, the city administration hopes to exercise some control over service by providing for a transportation commissioner who will have a voice in the management of the railway if it accepts the contemplated franchise.

The activity and present high value of the service company stock reflects the general opinion of the traders of St. Louis that the Missouri Public Service Commission will eventually grant the company the right to earn a return on much more than the tentative valuation of $52,000,000 fixed a few weeks ago. In hearings before the commission railway officials contended for a valuation of from $75,000,000 to $100,000,000. Close students of Missouri utility affairs believe that the new company will be granted the right to earn at least 7 per cent on a valuation of not less than $65,000,000 and perhaps $70,000,000. Others, however, are hopeful of a 7 per cent return on a valuation of not less than $60,000,000. They believe the city will accept that basis under a service-at-cost plan of operation.

Mayor Miller on July 20 informed Frank O. Watts, chairman of the reorganization committee of the United Railways, that he is opposed to granting immediately a 30-year franchise to the present company or its proposed successor, the St. Louis Public Service Company. The Mayor told Mr. Watts that he is still carefully considering the whole transportation problem, including the future development of subways and elevated lines, but expressed the belief that public interest probably would be best served by granting no new franchise at this time, and that it might be well to permit the railway to continue to operate under the present franchise, which has at least twelve years to run.

Seattle's System Discussed

Councilman returns from trip east convinced that Municipal Railway must get aid from city's general fund

DECLARING that Seattle's Municipal Railway must get aid from the city's general fund, which is raised by taxation, if adequate transportation is to be developed and maintained at a rate of fare demanded by the car riders, Councilman Oliver T. Erickson, veteran legislator, states that he is ready to take the initiative in preparing for submission to the voters at the next city election any proposed legislation required for this radical step. Mr. Erickson is leader of the majority group of five in the City Council and chairman of the utilities committee. He states that he will talk over the situation with other members of the Council, with a view of submitting a proposition to the people at the election next spring.

Meantime, Mr. Erickson's proposal has brought a storm of protest from various quarters, including S. B. Asia, chairman of the famous "Fourteen Taxpayers," who have consistently opposed an invasion of the general fund. Mr. Asia believes that the taxpayers of the city will never consent to a railway tax levy, which would increase the present "high taxes." Mr. Asia said:

> The municipal system is paying dividends in the form of principal and interest on the bonded debt. The system was started without any invested capital. . . . Quite likely, street car systems such as Seattle has are bound for the scrap heap. We have got to have subways and elevated railways—rapid transit—for one thing. But whatever the conditions may be, proper management makes successful business. We should turn our eyes in this direction, not toward supporting the railway by increasing taxes.

Four City Councilmen have expressed themselves as favoring Mr. Erickson's plan, but the Council is without power to act. An act by the State Legislature authorizing the Council to make a general fund levy for the railway or a vote by the people on a bond issue would be necessary if it were to be followed. One attempt was made at the last Legislature to procure legislation empowering the Council to levy at a rate of not to exceed 2 per cent for the railway department, but the proposed bill perished without being introduced.

Councilman J. T. Campbell also strongly opposes any act authorizing the Council to levy on the general fund. He declares that the railway department needs a measure empowering the Council to refund revenue bonds; that the system is suffering now because of big annual payments required on the purchase bonds. If these were lessened, the city would have money available for improvements to the system.

Mr. Erickson expresses the opinion that automobile competition has hurt all organized transportation systems to such an extent that it is now a question of higher fares or help from the general fund. Higher fares won't do, he declares, and he believes that the time is at hand when the people realize that it is better to have lower fares and make up the difference on the tax roll; "that is, if they want transportation."

A new type of billboard being installed at strategic points by the Interstate Public Service Company to boost its electric railway service between Indianapolis, Ind., and Louisville, Ky.

Special Service Aids Indiana Packers

The Union Traction Company of Indiana has appointed agents for the handling of shipments of live stock north from Indianapolis to Tipton, Kokomo, Elwood, Logansport and Peru and from Indianapolis to Anderson, Muncie, Marion and Wabash. Packers in those sections believe this special service will do much to eliminate delays and bring the stock to their plants in better condition.

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Much Ado About School Tickets in Massachusetts

The proposal to repeal the law which permits school children to travel for half fare on the electric railways of Massachusetts, under consideration by the Department of Public Utilities at the direction of the Legislature, has caused a storm of protest from municipal authorities, particularly school committees. Railway officials in general merely urge a modification that will take care of abuses which have crept in since the law was placed on the statute books.

At its inception the law took in only pupils of public and parochial schools, but in recent years the privilege has been extended to cover business colleges, evening schools, Americanization schools, summer schools and other institutions. The suggestion is made by some railway officials that an age limit be fixed for the use of such tickets, but this plan is assailed on the ground that it is the high school pupil who benefits more than the younger pupil, because high schools frequently are so located that many pupils must ride to and from them. It has also been suggested that hours for the use of such tickets be limited to a reasonable time before the opening and after the closing of school. The Department of Public Utilities is preparing a report on the subject, which will be filed with the Legislature before Dec. 1.

Referendum Fails—New Rates Continue in Houston

The petition seeking a referendum on the recent increase in electric railway fares on the lines of the Houston Electric Company, Houston, Tex., was more than 1,000 names short of the required number. It was said that a checking of the list by the city showed many names not found in the city or telephone directory or poll tax list. The new rates which went into effect in the Texas city on June 13 provided for a 10-cent cash fare, four tokens for 30 cents and the weekly ticket and a 4-cent children's rate. The old rates were 7 cents cash with a 6¼-cent token rate and a 3½-cent token rate for children. The failure of the referendum petition will mean that the new rates will be continued.

P.R.T. Offers 7½-Cent Fare

A 7½-cent fare from the West Philadelphia end of the proposed Chestnut Street subway into the city center of Camden, N. J., over the Delaware River Bridge is part of the plan of the Philadelphia Rapid Transit Company, Philadelphia, Pa. This was disclosed on July 13 when three officials of the company met with the executive committee of the Delaware River Bridge Joint Commission to discuss details of the transit company's proposal to operate cars across the interstate span at the present fare rate, with toll payment of ½ cent a passenger. Ralph T. Senter, president of the railway, repeated the company's offer to advance $600,000 with which to build the line, with provision for reimbursement out of the first P.R.T. toll payment.

The commission declined to commit itself on any of the questions until its counsel could thresh out the legal ramifications in that connection. It was pointed out that Philadelphia and Pennsylvania had money available out of bridge bond issues to contribute toward the trolley line construction, but that New Jersey at present was unable to finance its share of the cost of the work.

Another "Open House Week" in Toronto

The Toronto Transportation Commission, Toronto, Canada, held its second annual "Open House Week" from July 9 to July 16. During this time the doors of the properties were open to the public to see the internal activities of the public utility. The July 9 issue of the *Coupler*, the official paper of the Toronto Transportation Commission, gave in permanent form, to those desiring, some pertinent information relating to the transportation system, which was explained verbally to the visitors at the plant.

Messrs. McCarter and Castle Slightly Injured

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, and Charles C. Castle, vice-president of the American Car & Foundry Motor Company of New York, were in the hospital at Media, Pa., on July 20 recovering from injuries received in an automobile collision the day before on the Wawa Hill, Baltimore Pike, in which the McCarter car was involved. Mr. McCarter's injuries are said to consist of a broken tendon in the left hand and a cut on the forehead, while Mr. Castle received slight body bruises.

Decks Cleared for Omaha Franchise Draft

Delay has been experienced by the Corporation Counsel of Omaha, Neb., in the preparation of a franchise ordinance for the Omaha & Council Bluffs Street Railway. Before beginning work on the franchise ordinance the Corporation Counsel desired the assurance of the Guaranty Trust Company, New York, trustee for the bondholders, that pending the application for a new franchise it would not proceed with the suit which it brought in connection with the company's franchise.

Some time was consumed in obtaining from the trust company permission to give such assurance on their behalf, but it was finally obtained and the obstacle causing the delay was thus removed. The Corporation Counsel has now announced that he will proceed to draft the required ordinance.

Traffic Hazard to Be Eliminated in St. Paul

Elimination of a traffic hazard is to be made in St. Paul, Minn., by cooperation between the St. Paul City Railway and the Department of Public Works, St. Paul, with a project which will cost the company and city $10,000. At University Avenue and Prior Avenue cars of the Merriam-Mississippi line and the Hamline-South Robert line wye on to the heavy traffic street alongside the through tracks of the Minneapolis-St. Paul interurban line. The Hamline routing will be changed so the cars will not enter University Avenue, but will wye on Prior Avenue, which is to be widened by the city. A similar change may be worked out for the Merriam line on the other side of University Avenue.

Higher Fares in Effect

Increased fares went into effect in Kalamazoo, on July 7, as the result of action taken unanimously by the City Commission recently. The new fares charged by the Michigan Railroad are 10 cents for cash rides instead of 8 cents and three tokens for a quarter instead of four for a quarter. Increase in the fares was voted after the commission heard a report showing the company lost heavily last year and declaring the only alternative would be abandonment of the service for a substitute mode of transportation to be provided by the city itself.

Fare Advance Sought for Tri-City's Illinois Lines

The Tri-City Railway has announced that it will seek authority of the Illinois Commerce Commission to increase its fares on the Rock Island, Moline, Silvis and East Moline lines to a 10-cent basic rate with three tickets for a quarter. The present fare is on a 10-cent basis with fifteen tickets for $1. A 1-cent increase for children's fares to 5 cents is also being asked. The company is said to have lost $49,900 in the twelve-month period ended May 31, operating expenses being $727,897 and revenue $677,997, with no allowance made for return upon the investment of the company.

Advance in Fare Asked in Duluth

The Duluth Street Railway has petitioned the Railroad Commission of Wisconsin for increased rates in Superior, Wis. The company states that the present cash fare of 10 cents, or five tickets for 30 cents, is insufficient to produce a fair net return. The company states that during the past three years the highest return it has made on the rate base of $1,225,000, set by the commission in 1923, was 1.52 per cent. Moreover, it is confronted with extraordinary expenses incurred as a consequence of a train-street car collision.

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Recent Bus Developments

Experiment with Five-Cent Fare Watched in Oswego

Many transportation exponents are fastening their eyes on Oswego, N. Y., where an independent bus company is experimenting with a 5-cent fare in the face of the traditional failure of that charge to net any kind of a fair return on a transportation venture. Even children in this city of 22,369 people are being taken care of in the Dillon scheme with a 3-cent fare. Ten 25-passenger city type buses have been provided and the routes followed are in a general way those previously served by the trolley lines of the Empire State Railroad, although headways and mileage have been to some extent curtailed.

The tale of the two interests in Oswego really dates back to April 27, 1925, when the Common Council of the city granted the application of the Mid-State Coach Lines, subsidiary of the Empire State Railroad Corporation, to operate buses over certain routes in that city. At the same time it rejected the application of James Dillon of Syracuse for a similar grant, thus ending a controversy of many months duration between the two interests for the privilege of supplying transportation service in Oswego. The Public Service Commission of the State of New York issued the necessary certificate to the Mid-State Coach Lines on Aug. 6, 1925, and service was started on Sept. 24, 1925. The Empire State Railroad Corporation had for many years operated the local railway service in the city of Oswego and the bus service was intended to serve sections which the trolley lines did not reach. A 7-cent fare was established on both the bus and the trolley lines and an interchange of transfers without extra charge was provided.

Trolley service had been conducted at a steadily increasing loss for several years and it was hoped that the installation of bus service would permit a reduction in expenses and, ultimately, the abandonment of those railway routes on which the heaviest losses had occurred and where the company was faced with the necessity of meeting the expense of paving or track reconstruction. The public did not respond to bus service to the extent that had been anticipated, and during the year 1926 there was an operating loss, ahead of taxes and interest, of $24,432 on the Oswego railway lines and a loss of $29,296 from bus operations.

The company thereupon applied to the Public Service Commission for authority to abandon its local railway service entirely, reserving the tracks used by the Syracuse-Oswego interurban line. This permission was granted on March 3, 1927, and at midnight on April 21 the cars were run into the carhouse and service was suspended. Following upon the application of the corporation to discontinue its railway service in Oswego the Dillon interests renewed their application to supply bus service in the city in accordance with their original plans which had been rejected two years before. This application was unopposed by the railway and the necessary consents were secured from the city authorities and the Public Service Commission.

Terminal in Philadelphia Neither Essential Nor Expedient

After several months study of bus terminal facilities in various cities a group of engineers engaged for such a survey by the Public Service Commission of Pennsylvania has reported to the State body that a grand central bus terminal in the heart of Philadelphia "is neither essential nor expedient."

In a report submitted to W. D. B. Ainey, chairman of the commission, in Harrisburg, the engineers declared the financial outlay involved in a central-city terminal project would be out of proportion to the value of any possible reduction in traffic congestion.

It was suggested that with the future development of the Pennsylvania Railroad terminal plans it might be possible to establish a terminal of limited capacity west of 16th Street along the line of the new Pennsylvania boulevard which will occupy Filbert Street after the "Chinese Wall" is razed.

The engineering group pointed out the possibilities of developing the plan of parking automobiles at outer terminals of trolley and bus lines and using those facilities to reach the center of the city—a system which was inaugurated and is now in operation by the Philadelphia Rapid Transit Company.

The commission itself makes no formal ruling on the proposal for a central terminal, but supports the findings of the engineers.

In its report the commission predicts that some time in the future the municipality will be a large contributing factor in the establishment and maintenance of a bus terminal.

Williamsville-Buffalo Service Proposed

The Buffalo & Williamsville Railway, which operates a single track interurban line from the north Main Street city line at Buffalo to Williamsville, has applied to the Public Service Commission for permission to operate buses from Williamsville to Buffalo. The proposed route is through Main Street from the Transit Road in the town of Amherst, Kensington Boulevard into Buffalo, with a terminus at Lafayette Square, in downtown Buffalo. Railway officials say the proposed bus line will not affect the present railway service.

Interstate Service at Duluth

The Duluth-Superior Coach Company established an interstate bus service on July 20, over the new Arrowhead bridge between Duluth, Minn., and Superior, Wis., opened for traffic the previous Saturday. The coach company, a subsidiary of the Duluth Street Railway, offers transfer privileges between its cars and buses. The bus fare will be 25 cents. Persons transferring from a car to the bus will get a 5-cent credit for their transfer, and at the end of the bus ride a transfer will be given good for passage on the street car.

The railway fare between Duluth and Superior is 18 cents, 8 cents being the Duluth rate and 10 cents the tariff in Superior. Token fares cost 7 cents in Duluth and 8 in Superior, when bought in lots of five or more. The new bus line will be operated on a half-hour schedule, with the exception of the hours between midnight and 5 a.m. The running time will be twenty minutes.

The company also operates another line, over the Great Northern Railroad's toll bridge, the sole connecting link between the cities until the Arrowhead bridge was opened.

Additional Coach Lines for Toronto Commission

Permits and effects of the White Star Transit Company and the Lake Shore Motor Bus Company have been acquired by the Toronto Transportation Commission. As a result Toronto can now boast of a bus service covering surrounding territory which is undoubtedly the equal of any on the continent. In addition to the coach routes in the city, buses of the Gray Line, as the company formed by the T.T.C. is called, will operate over all the routes covered by the absorbed companies, will maintain a service to Buffalo, and will have available a large fleet for chartering purposes. Local sightseeing buses will continue to operate under the new company.

At present the management is not contemplating any change or extension of the service over that previously maintained. When asked as to the possibility of competition with radials or steam lines, Manager Harvey is said to have replied:

As for steam lines, they have had competition for years. But we have no intention of running in competition with the radials.

At present the only coach route in competition with radials is the Red Line to Port Credit, the only bus line on the Lake Shore route not operated by the T.T.C.

The new company is capitalized for $1,000,000. The officers are: President and general manager, D. W. Harvey, general manager of the T.T.C.; vice-president, Irving S. Fairty, counsel of the T.T.C.; treasurer, H. C. Patten, comptroller of the T.T.C. J. L. Smith will be responsible, as general superintendent, for the operation of the lines. Mr. Fairty will also act as secretary.

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Service Expanded in Toledo

One of the largest bus operations yet undertaken by the Community Traction Company, Toledo, Ohio, is the service established in West Toledo on July 11, when a new 5-mile cross-town line connecting the Cherry Street car line at two points with the Long Belt line in the Auburndale district, together with a Tremainsville Road feeder extension of the Cherry Street line, was placed in operation. The new service will take care of a territory comprising about 2,500 homes hitherto not served by the company.

The City Council passed a prohibitory ordinance after DeVeaux Park and Home Acres districts were taken into the city limits, but the ordinance was fought through the courts by Sylvania Buses, Inc., an independent interurban line operating through the territory now served by the railway. The Common Pleas Court and the Court of Appeals sustained the city in its right to bar the interurban from picking up city passengers. Now Sylvania Buses, Inc., has appealed for an injunction from the Ohio Supreme Court. The Court of Appeals held that the city having the right to permit the bus line to take on passengers also had the right to withdraw the privilege.

With the working out of the new franchise based on the memoranda of agreements reached between company representatives and the Street Railway Board of Control several other new bus lines and extensions will be included in the new operating arrangement, based on exclusive handling of public transportation by the railway.

The City Council has unanimously upheld Mayor Fred J. Mery in his veto of a bus regulatory ordinance passed a few weeks ago before a settlement on franchise problems appeared likely. With the provision for an exclusive franchise for the Community Traction Company included in the new agreement the proposed bus regulatory ordinance would have interfered by the licensing of independent operators for a two years period. On advice of the Street Railway Board of Control the ordinance was vetoed and this step approved by Council.

Franchise Sought by Louisville Railway

Officials of the Louisville Railway, Louisville, Ky., have asked for a franchise enabling them to institute a bus service in conjunction with street cars. The proposal calls for a 10-cent fare, with free transfers on buses, and a 7-cent railway fare, with a 3-cent charge for a transfer to a bus.

According to President James P. Barnes the company sees in the granting of such a franchise quicker downtown service from important sections of the city and a choice for residents between street car and bus transportation.

According to the request of the tram company, all five routes would loop in the central district between Jefferson and Liberty, Third and Fifth Streets, which would be a common transfer point for all through bus service. In addition to the through lines, transfer service is contemplated, it was said, connecting the end of the Frankfort Avenue car line with the Bardstown Road line, both cars and buses, and an extension of the present cross-town bus service which operates from Portland to Parkland.

This is calculated to bring service through Hill and Burnett Streets and Pindell Avenue to Audubon Park. Transfer service also is in the plan for Broadmeade, Strathmoor and Lauderdale connecting the Bardstown Road car and the Bardstown bus line. The company suggested a modification of the routing of certain railway lines to accomplish a saving of time.

Buses are now being operated in Louisville by the Kentucky Carriers, Inc., which is affiliated with the railway.

Objects to Railway Interference

The Massachusetts Coach Company, operator of buses for hire in Boston, Milton and Quincy, Mass., has recently brought a bill in equity in the Suffolk Superior Court against the Eastern Massachusetts Street Railway to enjoin it from operating buses in competition without proper licenses. The petitioner contends that the railway is breaking the law because the license which it holds has not been approved in writing by the Mayor of Quincy, although the Quincy City Council granted a license.

Equalizing Rates on Kansas City Interurban

Bus fares between Kansas City and Excelsior Springs have been increased by the Kansas City, Clay County & St. Joseph Transit Company, controlled by the Kansas City, Clay County & St. Joseph Railway. The increase makes the fare to Liberty 50 cents instead of 45 cents. The new rate to Excelsior Springs is 90 cents, an increase of 5 cents. Proportionate increases are effective to intermediate points. It was with the idea of equalizing the fare on the interurban line and bus lines that the rate was so increased, according to Robert P. Woods, vice-president and general manager. He said the two kinds of transportation service would be tested and the type preferred by the patrons would be increased proportionately. The schedule between Liberty and Excelsior Springs has been changed to two-hour service instead of a car every hour. The plan is to utilize bus service on the off hour.

The recent purchase by the Kansas City, Clay County & St. Joseph Transit Company of the Yellow Bus System, a competing line, gives the transit company and railway line a monopoly on the transportation system in Clay County. Only a short time ago the fares on the electric railway were increased to 3 cents a mile. The old rate was 2½ cents. A new commutation book containing tickets for twenty rides at about 25 per cent reduction over the regular fare may now be purchased for use on buses or on electric railway lines.

Superior Bus Service and Sightseeing Tours in Cincinnati

A well-defined plan of efficient operation characterizes the venture of the Cincinnati Street Railway, Cincinnati, Ohio, in the recently installed de luxe bus motor coach service and sightseeing tours. A new Mack six-cylinder parlor coach, the latest in design, is being used for both of these services. The coach is equipped with 29 individual seats staggered so that all persons have unobstructed views. The de luxe line, mentioned briefly in the ELECTRIC RAILWAY JOURNAL, issue of July 16, is a no-standing passenger run from one of the exclusive residential sections of Cincinnati to Government Square, the heart of the business district. Two trips are made downtown in the morning and three returning trips in the evening. A 25-cent fare is charged. This is three times the regular railway ticket fare, but it is much lower than the cost of driving an automobile to the office. The round-trip fare of 50 cents is about the average charge for parking all day.

After the coach finishes its last morning trip to the business district, it starts directly upon the 9:30 a.m. sightseeing tour from the downtown hotels. This tour is two hours long, as is the afternoon tour, which begins at 2 p.m. Both trips are different, so that patrons of the morning trip are prospects for the afternoon ride. When the coach completes its afternoon sightseeing run it is down in the business district, where it can start at once on its return runs of the de luxe service. The equipment is, therefore, used for a full day of business and has two different kinds of service to support it.

One dollar per trip is charged for the sightseeing tours. Reservations are handled by hotel porters in the same way that Pullman reservations are handled by these porters. Three downtown hotels, the Sinton, the Gibson and the Metropole, were chosen for loading points. Three University of Cincinnati students have been trained as guides and they are proving that the guide is one of the most important elements in making the tours popular. The out-of-town visitor is pleased when he is received as a guest who is visiting the guide's home town rather than as a rubberneck.

Along with these special runs which have been added to the Cincinnati Street Railway motor coach service in the past few weeks is an extension of regular motor service to the Coney Island Amusement Park. This resort is about 9 miles from the center of the city. In the past it has been reached mainly by steamers, but people could go there by transferring to an interurban line. The new motor coach line gives speedy service on a basic 45-minute headway. Coaches are added without limit as travel to the park justifies.

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Financial and Corporate

Sale of Washington-Virginia Line Confirmed

The sale of the properties of the Washington-Virginia Railway, which took place at public auction on May 10, has been confirmed by a decree of the Circuit Court, entered by Judge Samuel G. Brent at Fairfax Courthouse. The total price paid for the road and equipment was $575,000.

The Mount Vernon division, which extends from Washington to Mount Vernon, through Alexandria, was purchased by Lewis H. Parsons, Philadelphia, for the protective committee of the bondholders of the road, for $300,000, while the Falls Church division was sold to John McMullin of Philadelphia for $150,000, he representing the bondholders of that division. The equipment, which was sold separately, was purchased by John Wyne, also of Philadelphia. The price was $125,000.

Plans are already being made to rehabilitate part of the road. As a step in that direction the State Corporation Commission has approved the charter for the Arlington-Fairfax Railway, backed by citizens of Arlington and Fairfax Counties, which plans to take over the Falls Church division.

Park Property at Lynchburg Sold

The Lynchburg Traction & Light Company, Lynchburg, Va., has announced the sale of the old Rivermont Park to D. W. Persinger, Roanoke, at a price reported to have been $100,000. The property came into the hands of the original Rivermont Street Railway during the '80s, but became the property of the traction and light company in 1894. It was operated by the railway as a park and amusement resort until about fifteen years ago, when the development of moving picture theaters rendered it obsolete. The property is located 2½ miles from the center of the city.

Deficit in Toledo in June

Operations of the Community Traction Company, Toledo, Ohio, for June resulted in a deficit of $34,424 to the fare stabilizing fund, bringing the total deficit to $1,037,379. Passenger revenue continued to decline, showing $264,738, compared with $274,569 in June last year. Total railway operating revenue was $258,454, of which $196,783 was required for operating expense, with $17,416 set aside for taxes, leaving a gross income of $44,255. There were 3,522,497 revenue passengers. They paid an average fare of 7.037 cents and were carried at an average cost, including taxes, of 6.081 cents. This was before capital charges and sinking fund payments.

The co-ordinated bus and street car operation in June of this year amounted to 607,859 coach and car miles, a gain of about 9 per cent.

Revenue collected from bus operation was $16,846, while other special bus operation added $3,872. There was a deficit of $418 after deducting operating expenses and proper share of taxes. In this operation 207,004 revenue passengers were handled at an average fare of 8.138 cents. The cost per passenger was 10.211 cents.

Lake Shore Reports Deficit for 1926 Operation

The gross earnings of the Lake Shore Electric Railway System, Cleveland, Ohio, for the year ended Dec. 31, 1926, were $3,253,558, against $3,199,762 for the year ended Dec. 31, 1925. After the consideration of operating expenses, taxes and interest payments the year's operation was concluded with a deficit of $13,309, against a surplus in 1925 of $105,092. These figures, which were given in the 26th annual report of the company, include operation of the Lake Shore Electric Railway, the Lorain Street Railroad, the Sandusky, Fremont & Southern Railway and the Lake Erie Power & Light Company. Separate figures on the railway operation are given in the accompanying statements. During the year 5,500 ft. of new track with 100-lb. rail on concrete foundation was laid in East Main Street, Norwalk. The second track across the new concrete bridge at Fremont was completed and placed in service. The storeroom building at the Sandusky shops was completed and placed in use early in the year, all material and supplies being centered at that location. Three old passenger cars were rebuilt and made

EARNINGS AND EXPENSES OF LAKE SHORE ELECTRIC RAILWAY

	1926	1925
Gross earnings	$2,466,120	$2,523,040
Operating expenses and taxes	2,130,572	2,068,013
Net earnings	$335,548	$455,026
Interest paid	360,829	347,627
	*$25,281	$107,399
Ratio of operating expenses to gross earnings, per cent	86.39	81.97
Car miles operated	4,544,247	4,108,751
Passengers carried	5,765,762	5,730,729

* Deficit.

DETAILED EARNINGS AND EXPENSES OF THE LAKE SHORE ELECTRIC RAILWAY

Earnings:	1926	1925
Passenger revenue	$1,095,881	$1,139,932
Baggage revenue	689	907
Special car revenue	7,125	6,291
Mail revenue	2,477	2,853
Express revenue	163,157	173,631
Milk revenue	4,098	5,916
Freight revenue	586,817	532,790
Switching revenue	9,325	20,989
Miscellaneous transportation revenue	4	4
Station and car privileges	12,434	11,430
Parcel room receipts	4,845	4,305
Storage	2,874	1,820
Rent of tracks and facilities	50	50
Rent of equipment	17,671	14,253
Rent of buildings and other property	1,029	743
Power	518,976	583,949
Miscellaneous	38,662	23,582
Total	$2,466,120	$2,523,453
Expenses and Taxes:		
Maintenance of way and structures	$303,228	$254,432
Maintenance equipment	179,635	162,332
Operating power plants	516,066	612,582
Conducting transportation	669,169	598,008
Traffic	19,029	14,178
General and miscellaneous	323,916	302,006
Taxes	119,525	124,472
Total	$2,130,572	$2,068,013

EARNINGS AND OPERATING EXPENSES OF THE LORAIN STREET RAILROAD

	1926	1925
Gross earnings	$356,008	$319,885
Operating expenses and taxes	290,324	291,072
Net earnings	$65,683	$28,813
Interest paid	35,593	42,140
Surplus	$30,090	$13,326
Ratio of operating expenses to gross earnings, per cent	81.55	91.00
Car miles	1,014,002	1,005,539
Passengers carried	4,952,474	4,235,165

* Deficit.

DETAILED EARNINGS AND EXPENSES OF THE LORAIN STREET RAILROAD

Earnings:	1926	1925
Passenger revenue	$353,745	$317,192
Baggage revenue	.....	10
Special car revenue	69	198
Mail revenue	1,029	1,028
Milk revenue	.....	140
Station and car privileges	925	765
Rent of equipment	7	12
Rent of buildings and other property	28	322
Miscellaneous	203	217
Total	$356,008	$319,885
Expenses and Taxes:		
Maintenance of way and structures	$34,656	$45,534
Maintenance equipment	28,629	31,819
Operating power plants	54,736	54,597
Conducting transportation	126,848	118,745
Traffic	680	925
General and miscellaneous	27,138	37,976
Taxes	17,635	1,473
Total	$290,324	$291,072

EARNINGS AND OPERATING EXPENSES OF THE SANDUSKY, FREMONT & SOUTHERN RAILWAY COMPANY

	1926	1925
Gross earnings	$162,346	$167,919
Operating expenses and taxes	189,531	173,572
Net earnings	*$27,185	*$5,653
Interest paid	32,250	32,250
Surplus	*$59,435	*$37,903
Ratio of operating expenses to gross earnings, per cent	116.7	103.3
Car miles	407,861	403,666
Passengers carried	231,003	230,244

* Deficit.

DETAILED EARNINGS AND EXPENSES OF THE SANDUSKY, FREMONT & SOUTHERN RAILWAY

Earnings:	1926	1925
Passenger revenue	$81,792	$75,384
Baggage revenue	47	175
Special car revenue	500	900
Express revenue	4,584	5,370
Milk revenue	703	314
Freight revenue	72,461	85,325
Station and car privileges	362	450
Miscellaneous	1,894	.....
	$162,346	$167,919
Expenses and Taxes:		
Maintenance of way and structures	$27,614	$24,047
Maintenance equipment	16,359	19,734
Operating power plants	46,997	29,017
Conducting transportation	60,940	66,003
Traffic	1,733	1,579
General and miscellaneous	29,171	26,309
Taxes	6,715	6,881
Total	$189,531	$173,572

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into freight motor cars. Twenty standard electric freight trail cars were purchased from American Car & Foundry Company and placed in service.

STATEMENT OF CAPITAL EXPENDITURES

Lake Shore Electric Railway	$181,502
Lorain Street Railroad	10,351
Sandusky, Fremont & Southern Railway	32,794

Expenditures for additions and improvements charged to capital account are shown in the accompanying table.

First Preferred Dividend of New Grand Rapids Company

At a meeting of the board of directors of the Grand Rapids Railroad, Grand Rapids, Mich., formerly the Grand Rapids Railway, on July 19 it was voted to pay the initial quarterly dividend of $1.75 per share on preferred stock on Aug. 1 to stockholders of record July 21. This is the first dividend by this property on the preferred stock since 1918. Its declaration follows the recent recasting of the financial structure of the company.

Court Authorizes Bond Interest Payment by Chicago Railways

Regular semi-annual interest on the first mortgage bonds of the Chicago Railways, amounting to $1,391,375, and due on Aug. 1, will be paid at that time by virtue of an order issued on July 19 by Federal Judge James H. Wilkerson.

South Shore Seeks to Abandon Track in East Chicago

Authority to discontinue local street car service between Chicago Avenue and Guthrie Street, in the city of East Chicago, Ind., was asked on July 9 in a petition filed with the Indiana Public Service Commission by the Chicago, South Shore & South Bend Railroad.

Operations over this 2-mile branch, which connects the main line of the railroad with a populous industrial section known as Indiana Harbor, was suspended in July, 1926, when the main line electrical overhead system was converted from 6,600 volts to 1,500 volts d.c. It is proposed to remove the tracks at once.

A marked preference among residents of the territory served for motor coach service furnished by the Shore Line Motor Coach Company, a subsidiary of the South Line, together with the excessive cost of reelectrifying and reconditioning the line are advanced in the railroad's petition as reasons which militate against a resumption of service.

More Illinois Power & Light Stock for Customers

On July 1 the Illinois Power & Light Corporation, Chicago, Ill., made available to its customers and stockholders some additional shares of its 6 per cent cumulative preferred stock, at $92 per share yielding 6.32 per cent. Plans are in effect which call for the disposal of all these shares in the Illinois territory during the month of July.

Representatives of the investment department and employees have been forwarded advertising literature for distribution among the stockholders and others interested and an elaborate campaign of newspaper advertising is planned to assist in promoting the sale of stock.

Decorative posters printed in two colors were distributed and have been placed in the regular frames and other prominent places on the various properties calling the attention of the public to the issue. Other advertising material includes an "offering circular," a four-page circular in two colors and a bill insert. In announcing the sale of the additional shares the company said in part:

It has always been the desire of Illinois Power & Light Corporation to operate on a partnership basis with its customers. When capital for extensions and additions to the property can be partially provided through the issuance of stock, the company prefers to sell the preferred shares to the people who use our service. It is better for us and better for the customers to have them as partners in this business.

NET INCOME HIGHER.—For the twelve months period ended June 30, 1927, the total operating revenue for the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., was $46,710,592, against $44,840,968 for a similar period ended June 30, 1926. The total operating expenses increased from $29,220,839 to $30,388,173. After the consideration of income deductions, the net income for the twelve months period ended June 30, 1927, amounted to $6,354,280, against $5,762,358 for the twelve months period ended June of last year.

INDIANAPOLIS & CINCINNATI CASE CARRIED OVER.—Settlement of the Indianapolis & Cincinnati Traction Company foreclosure suit and other claims, involving $2,000,000, will go over to the September term of the Circuit Court at Rushville, Ind., the court having closed for the summer vacation with no decree being entered in the matter.

STEAM RAILROAD AFTER COAL BELT ELECTRIC.—The Missour Pacific Railroad on July 8, asked the Interstate Commerce Commission for authority to acquire 10 miles of line from Marion to Herrin, Ill., now operated by the Coal Belt Electric Railway.

SEEKS TO DISCONTINUE LINE.—W. H. Lines, vice-president of the Portland Electric Power Company, recently asked the City Council of Portland, Ore., to permit a discontinuance of the Brooklyn carline effective June 26. This is the date that was set for the installation of bus service on the Powell Valley line. The new service as proposed would entail a few adjustments on the bridge line along Grand Avenue.

ABANDONMENT ON THREE LINES ALLOWED.—The Pacific Electric Railway, Los Angeles, has been authorized by the California Railroad Commission to abandon service and remove tracks in the city of Redlands on three lines.

Conspectus of Indexes for July, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	July 1927 **7.52**	June 1927 **7.44**	July 1926 **7.36**	July 1927 **7.52**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	July 1927 **142.9**	June 1927 **143.0**	July 1926 **154.1**	Sept. 1920 **247.5**	July 1927 **142.9**
Electric Railway Wages* 1913 = 100	July 1927 **227.8**	June 1927 **227.5**	July 1926 **225.7**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	July 1927 **199.9**	June 1927 **200.6**	July 1926 **203.2**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	July 1927 **203.7**	June 1927 **205.6**	July 1926 **207.8**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	June 1927 **143.7**	May 1927 **144.1**	June 1926 **152.3**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	July 1 1927 **12.38**	June 1 1927 **12.43**	July 1 1926 **12.74**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	June 1927 **158.5**	May 1927 **155.4**	June 1926 **159.7**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	June 1927 **164.8**	May 1927 **163.7**	June 1926 **167.0**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	June 30 1927 **3.053**	May 31 1927 **3.051**	June 30 1926 **3.479**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	June 1927 **19.15**	May 1927 **18.62**	June 1926 **19.10**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number	June 1927 **1689**	May 1927 **1617**	June 1926 **1577**	Jan. 1924 **2231**	Aug. 1925 **1353**
Liabilities (Millions)	**46.98**	**39.92**	**49.51**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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Personal Items

H. H. Fryling Made Claims Attorney for Public Service

Henry H. Fryling, counsel to the claim department of the Public Service Corporation of New Jersey, has been named to succeed Judge Joseph Coult as claims attorney for Public Service companies, which include the Public Service Railway and the Public Service Transportation Company. Mr. Coult resigned to take up the practice of law with David Satz under the firm name of Coult & Satz.

Mr. Fryling is a native of Essex County. He lives in South Orange. He studied law in Newark and was admitted to the bar in February, 1897, as an attorney and three years later as a counsellor-at-law. He carried on a general practice in Newark since his admission to the bar and until he came to Public Service on May 1, 1921.

As trial attorney he has tried cases for Public Service subsidiaries in every county of the state in which they operate. On Jan. 1, 1926, he succeeded Leonard J. Tynan as counsel to the claim department, continuing since, however, to try cases in the Essex County courts. As counsel to the claim department he had charge of all appeals to the Supreme Court and Court of Errors and Appeals.

J. T. Hambleton to Manage New Bus Company

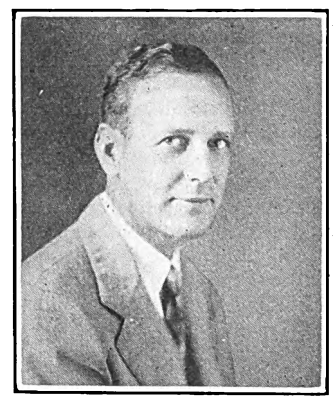
Joseph T. Hambleton has resigned as general manager of the Hartford & Springfield Coach Company, the successor to the Hartford & Springfield Street Railway, Warehouse Point, Conn. He also has resigned as general manager of the Springfield Bus Terminal Company, Springfield, Mass., with a bus terminal on Worthington Street, Springfield, built under his direction. Mr. Hambleton's plans are not definite, but it is believed he will go to Easton, Pa., to manage a new bus company.

Mr. Hambleton began his electric railway experience in Allentown, Pa., in 1894, serving the Lehigh Valley Transit Company's lines in various capacities for several years. In 1900 he became superintendent of construction for the Bethlehem Construction Company, having charge of the work on the Dayton, Springfield & Urbana Railway and other routes. At this time he built the Slate Belt Transit Company line, first operated by the Lehigh Valley System. From 1911 to 1916 Mr. Hambleton was general manager of the Wilmington Southern Traction Company. Gaining control of the Slate Belt Transit Company in 1916, he was made president and general manager, with headquarters at Pen Argyl, Pa. He was appointed general manager of the Hartford & Springfield Street Railway in July, 1923. A. C. Marshall, vice-president of the Hartford & Springfield Coach Company, is temporarily directing the operations of the company.

Joseph Bowes Filling Responsible Position at El Paso

Joseph Bowes, as manager of the El Paso Electric Company, El Paso, Tex., is applying the practical knowledge and experience he gained during many years service with the Stone & Webster utility companies. He recently resigned at Lake Charles, La., where he had been general manager of the Gulf States Utilities Company. Under his management the Louisiana properties passed through a period of growth and expansion.

Mr. Bowes began working for Stone & Webster in 1909. He was first employed as superintendent of operations of the light and power department of the Tacoma Railway & Power Company, Tacoma, Wash. In 1916 he joined forces with the Southwestern district, when he was sent to Port Arthur as general superintendent. Seven years later he was made general superintendent of the Eastern Texas Electric Company and transferred to Beaumont. When the property at Lake Charles was purchased in 1924 Mr. Bowes was chosen as manager. In June, 1926, the Lake Charles property was consolidated with those which now comprise the Gulf States Utilities Company, Louisiana division, and he became general manager in charge of all operations in Louisiana.



Joseph Bowes

Mr. Bowes was born in Washington, D. C., in 1885. He was graduated from Cornell as electrical engineer in 1907.

D. N. Dunlop, director of the British Electrical and Allied Manufacturers Association, has been appointed British representative on the permanent committee on electrical questions set up by the advisory and technical committee of the League of Nations.

Newspaper Man to Handle Publicity at Jacksonville

Herbert Bayer, considered one of the best reporters in the State of Florida, has entered the electric railway field as publicity and advertising director for the Jacksonville Traction Company, Jacksonville, Fla., a newly created position. His retention by the railway coincides with a branching out of the company into new fields of endeavor in acquainting the public with news of its operation and problems. In his new work Mr. Bayer will conduct research work for data to be used for stories for technical magazines. He will also edit the employees' magazine and "Trollicar Topics," a pamphlet distributed through the street cars. Here he will have the opportunity to enliven the company's publications with stories of human interest concerning employees and operation and develop general news of the railway.

Mr. Bayer has worked on daily papers of Jacksonville for many years. He has been affiliated with the Jacksonville *Journal* and the Florida *Times-Union*. His new connection necessitated his resignation from the editorial staff of the Florida *Times-Union*.

James H. Miller of Rochester has been named superintendent of the Pontiac city lines of the Detroit United Railways, Detroit, Mich. He succeeds Frank W. Davis. He was formerly connected with the Detroit United Railway in Detroit.

C. F. Hewitt, formerly with the Peter Smith Heater Company, Detroit, Mich., has recently been appointed staff engineer of the Department of Street Railways at Detroit, Mich., under Del A. Smith, general manager. Mr. Hewitt has long been connected with electric railway work, having served among other properties the Des Moines City Railway and the United Traction Company, Albany, N. Y.

T. U. Fairlie, Toronto, Ont., identified with electric railway and radial developments in the so-called border cities of Canada for several years, has resigned from the Ontario Hydro-Electric Power Commission to enter the brokerage business in Toronto with J. F. H. Ussher.

W. P. Johnston, formerly manager of the Inland Empire electric lines out of Spokane, Wash., prior to the sale of the system to the Great Northern Railway, has been made secretary and general manager of the Red Collar Steamboat Company, operating on Lake Cœur d'Alene and the St. Joe River.

James Dalrymple, until recently general manager of Corporation Tramways in Glasgow, Scotland, has returned from his South American expedition. By request of the authorities concerned he has carried out an investigation of tramway problems in Sao Paulo and Rio de Janeiro. As a result private reports have been presented to the authorities in both cities.

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OBITUARY

Col. W. A. Gaston

Colonel William A. Gaston, prominent lawyer and banker of Boston, thrice Democratic candidate for the Governorship of Massachusetts and in 1922 unsuccessful rival of Henry Cabot Lodge for Lodge's seat in the United States Senate, died on July 17 at his country estate, Killingly Farm, at Barre, Mass. His age was 68.

In 1887, when it was sought to form the West End Street Railway from separate companies then operating in and about Boston, Colonel Gaston was chosen by the financial interests to carry out the proposed reorganization of what was afterward the Boston Elevated Railway. He put the elevated on a business basis, reduced the fares, improved the service and created *esprit de corps* among its employees by bettering the conditions under which they worked. Among the things he did was provide a system of promotion for merit and start a policy of insurance against accident for the workers. He also laid down the rule, since followed by the Elevated, that all large contracts should be awarded in the open market after being freely advertised in open competition.

In 1904 he returned to the practice of law and in May, 1907, became president of the National Shawmut Bank. Failures were of daily occurrence at that time. Despite the remonstrance of some of his directors, Colonel Gaston sent out a circular letter to every bank and trust company in the country that had business dealings with the Shawmut, urging them to extend the maturing notes of merchants and thereby avoid forcing failures and help the serious mercantile situation by bringing about an earlier restoration of confidence.

The Gastons are descended from a French Huguenot family which fled from France to Scotland under the leadership of Jean Gaston in the seventeenth century and later emigrated to America. A grandson of Jean Gaston, born in County Antrim, Ireland, came to this country between 1720 and 1730 and was the original American ancestor of Colonel Gaston. William Gaston, the colonel's father, was twice Mayor of Boston, served in both houses of the Legislature and became Governor of Massachusetts in 1875.

Colonel Gaston began his education in a private school conducted originally by Laban Beecher for the education of his own children. Subsequently he attended the Washington Grammar School, Roxbury, and the Roxbury Latin School. At Harvard he numbered among his classmates, besides the future President Roosevelt, Robert Winsor, head of the banking house of Kidder, Peabody & Company; the late Robert Bacon, partner in the Morgan banking firm of New York and Ambassador to France; Richard Saltonstall and Joseph Quincy.

After graduating, he spent two years in the Harvard Law School and was admitted to the Suffolk bar in 1883. He entered the office of his father's firm, Gaston & Whitney, and showed conspicuous ability in court and in the management of large estates. In 1890 Frederick E. Snow was taken into the partnership and remained with William A. Gaston after former Governor Gaston retired. Richard Saltonstall, Colonel Gaston's classmate, entered the firm several years later.

Colonel Gaston as a young man excelled in sparring, wrestling, baseball and running, and became the middleweight champion boxer of Harvard. The story of how he defeated the redoubtable Ramon Guiteras in three ten-minute rounds, with a future President of the United States for his second, is a Harvard saga.

F. S. Elgin

Frank S. Elgin, member of the board of directors of the Memphis Street Railway, Memphis, Tenn., and co-receiver with T. H. Tutwiler for the railway and the Consolidated Gas & Electric Company during the period of those receiverships in 1920-22, is dead.

Mr. Elgin was 54 years old. He came prominently before the public about 25 years ago when he was appointed by the late President Roosevelt as the United States Marshal at Memphis. He served in that capacity for about seven years and later as standing master in chancery.

When Mr. Elgin gave up the office of marshal, about seventeen years ago, he entered upon the practice of law. He received during the later years of his life recognition through the appointment to a number of receiverships, notable among these being that for the William R. Moore Dry Goods Company in addition to those for the local railway.

Mr. Elgin in December of last year gave up the active practice of his profession in Memphis and went to California, hoping the mild climate there would help him in his efforts to restore his health.

A. B. Brown

Alexander Beal Brown, general representative of the air brake department of the Canadian Westinghouse Company, Ltd., died at his home in Montreal, Que., on June 8, 1927.

Mr. Brown was born on June 6, 1873, in Scranton, Pa. After he completed his education in the public schools of his home city in 1887 he entered the employ of the Delaware, Lackawanna & Western Railroad as an apprentice in the machine shop, and, upon finishing his apprenticeship, he was transferred to the air brake inspection department and made assistant to the air brake inspection foreman. He remained in this position until in 1897 he was offered an appointment by the Westinghouse Air Brake Company as an assistant on the Westinghouse Air Brake instruction car, which he promptly accepted. He was subsequently made inspector with the Air Brake Company at Buffalo, where he remained until 1903, when he was transferred to Hamilton, Canada, to act in a similar capacity with the Canadian Westinghouse Company, making his headquarters in Montreal, Que. He afterward was appointed general representative of the air brake department of that company.

Frank F. Gilmore, Jr.

Frank F. Gilmore, Jr., 43 years of age, manager of the Louisville Safety Council, which is strongly supported by all the utilities in Louisville, died on July 14.

Mr. Gilmore was born in Louisville, and was graduated from the Louisville Male High School. He was advertising representative of a number of publications from 1902 to 1917. He then became advertising manager of *Kentucky Farming* and later advertising manager of the *Southern Agriculturist.* For a time he was with the Morgan-Robinson Advertising Agency. He went with the Safety Council as manager in November, 1923.

Jay B. Odell, a vice-president and director of the Western Electric Company, died on July 8 in the New Rochelle, N. Y., hospital following an operation for appendicitis. Mr. Odell was born in Iowa Falls, Iowa, 44 years ago. He was graduated from Cornell University in 1904. Immediately following his graduation he entered the employ of the Western Electric Company in New York, later going to the Chicago works of the company at Hawthorne. In 1924 he became assistant to the president of the Western Electric and in January, 1926, was elected a vice-president of the company in charge of purchasing and traffic, the post he occupied at the time of his death.

Howard A. Clouser, assistant claim agent of the Northern Ohio Power & Light Company, Akron, Ohio, for the last six years, died recently. He was a graduate of Central High School and an Akron University student. He handled court cases for the company, and was studying law during his spare hours.

Edward Beadle, Sr., of Cranford, N. J., died at his residence there on July 8. Mr. Beadle in early life was engaged in the manufacture of street railway supplies. He was born in New York 82 years ago.

Duncan A. Smith, well known in railway circles in New York City, died recently at his home in Jamaica. Twenty-five years ago Mr. Smith was appointed to the New York & Queens County Railway at its plant at Woodside. Later he had charge of the plant at Cedar Manor. He continued with the company until about the time Gen. Lincoln C. Andrews was appointed by the court to the post of receiver of the railway. Mr. Smith was 60 years old.

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Manufactures and the Markets

St. Louis Car Gets San Francisco Order

The ten new cars authorized by the San Francisco supervisors for the San Francisco Municipal Railway, San Francisco, Cal., will be ordered at once and may be ready for service on the Judah Street line and the Duboce tunnel route by the latter part of the year.

These cars will be built by the St. Louis Car Company under the terms of the old contract, which was made elastic. Fifteen cars have been delivered under this contract, entered into last November, and are now in service.

The only major change in the new cars over those purchased under a former contract will be in the construction of the trucks. They will be made by the J. G. Brill Company, Philadelphia, instead of the Standard Steel Car Company, Newcastle, Pa. The reason given for this change is that the Brill trucks come more nearly up to specifications. Westinghouse motors will be installed. All cars in use on the Municipal Railway are of semi-steel construction. They are known as the California type.

$22,282,300 Subway Contract Awarded

The Board of Transportation, New York City, awarded on June 4 to the Mason-Hangar Company, Inc., the contract for the Fulton Street route of the city's new subway system at its bid price of $22,282,309.75, the lowest of seven bids received on May 18. The contract calls for the construction of both an extensive stretch of subway and a tunnel under the East River, from Church Street and Park Place, Manhattan, by way of Fulton Street to Nassau and Jay Streets, Brooklyn.

The Fulton Street tunnel will be the first connecting link between Manhattan and Brooklyn in the city's new subway system. The contract is the second under-river tunnel contract awarded by the Board of Transportation, the other being for construction of the 53d Street tunnel under Welfare Island to Long Island City, from which the Queens subway to Jamaica and the Brooklyn crosstown subway through Greenpoint and the Eastern District of Brooklyn will branch out.

125 Peter Witt Cars Ordered by Detroit Railways

An order for 125 new street cars of the Peter Witt type equipped with rattan seats has been placed by the Department of Street Railways of the City of Detroit with the Cummings Car & Coach Company of Chicago. Proposals were asked by the city for leasing to the municipal department a number of street cars with an option of purchasing and bids were received from the St. Louis Car Company, Cummings Car & Coach Company, J. G. Brill Company and the Cincinnati Car Company and opened on July 14.

As drawn the contract provides for an initial payment of $250,000 at the time of its execution and $18,000 per month starting Aug. 1, 1927, to July 1, 1937, inclusive, thus distributing the payments over a ten-year period. The Cummings company will begin delivery of the cars in 90 days and continue at the average rate of eight cars per week until all cars are delivered.

The contract covering the transaction of the purchase of the cars was certified by the Detroit corporation council, and, together with the escrow agreement among the municipal street railway department, the Cummings company and the Guardian Trust Company of Detroit, received the approval of the City Council.

The purchase of the new cars was requested in anticipation of the transportation rush expected to follow increased activity at the Ford motor plant.

A New Era Ahead for Europe

Geneva and Stockholm meetings point way to rehabilitation. Germany making rapid progress

THE rehabilitation of Europe through the world Economic Conference at Geneva and the recent meeting of the International Chamber of Commerce at Stockholm is seen as now on the way to accomplishment by Edward J. Mehren, vice-president and chairman of the editorial board of the McGraw-Hill Publishing Company, Inc., who has just returned from Europe. He went abroad to attend the Geneva and Stockholm sessions and to study industrial conditions in Italy and Germany.

At Stockholm leading business men of the world, meeting in the International Chamber of Commerce, took steps to put into effect the conclusions of the International Economic Conference held at Geneva in May. The Geneva conference for the first time gave the world a clear picture of Europe's economic ills and of the necessary remedies. The international chamber approved the Geneva conclusions and called upon its national committees, organized in the several countries, to urge their respective governments to pass the legislation necessary to make the conclusions effective. The votes of the delegations were a virtual pledge that they would bring such pressure to bear on their governments. The conclusions relate chiefly to steps for the removal of trade barriers. According to Mr. Mehren, the chamber's organization will follow up its national committees to help secure the desired result. Geneva and Stockholm, therefore, may well mark a turning point in European affairs, the advent of a new era.

As Mr. Mehren sees it, continental Europe has made good strides in recovery, but further progress is impeded by the trade barriers everywhere erected. Trade is lagging. Unemployment is large and living standards are below those of pre-war times. Early help is needed. Therefore the importance of the Geneva and Stockholm meetings.

In commenting on Germany's progress toward recovery, Mr. Mehren said that it has been noteworthy. He thus summarized the situation there:

There is an enthusiasm, an intelligence and an energy among Germany's industrial leaders that is astonishing and inspiring. Every means for reducing production costs is being intensively studied. Her handicaps will prevent her from being at once as formidable a rival in foreign trade as she was before the war, but eventually her ability to produce cheaply and well will challenge the industrial genius of every other land. We in America can hold our place in the future competition with her only by the same means she is employing—hard work and thorough and extensive scientific and industrial research.

For us in the United States the lesson would seem to be this: Just now the competition of Germany will not have serious concern for the American people at large, but as our need for foreign markets grows and Germany's handicaps are reduced German competition will be of deep concern to us. Let it not be looked forward to as commercial or industrial warfare. It is but the competition that we as Americans expect among ourselves; to the most intelligent, the most efficient shall go the reward. So, too, in the future competition in foreign trade. Germany will be a worthy rival; the tools of competition will be the research laboratory, studies in waste reduction, researches to discover new methods and new products, and, finally, hard and intelligent work. We are stimulating Germany now to high endeavor in engineering enterprise and industrial management. She will, in turn, stimulate us. Our future position as against Germany will depend on our technical ability and commercial alertness.

With the convention still 2½ months away the American Electric Railway Association reports

241 Exhibitors

and

112,756 Sq.Ft.

as of July 21

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STATEMENT OF SALES AND EARNINGS OF THE GENERAL ELECTRIC COMPANY FOR SIX MONTHS

	1927	1926
Net sales billed	$149,795,026	$147,450,867
Less: Cost of sales billed, including operating, maintenance and depreciation charges, reserves and provision for all taxes	130,930,258	131,191,460
Net income from sales	$18,864,768	$16,259,407
Other income, less interest paid and sundry charges	4,965,393	3,811,516
Profit available for dividends	$23,830,162	$20,070,923
Less: Cash dividends on special stock	1,287,190	1,070,530
Profit available for dividends on common stock (7,211,481 84/100 shares issued)	$22,542,972	$19,000,392

Details of General Electric Sales for Six Months

General Electric Company sales billed for the first six months of 1927 amounted to $149,795,026, compared with $147,450,867 for the corresponding period last year. Profit available for dividends on common stock for the six months of 1927 was $22,542,972, compared with $19,000,392 for the similar six months last year.

The profit available for common stock is equivalent to $3.13 per share in 1927 and $2.63 per share in 1926.

American Car & Foundry Net Earnings Fall

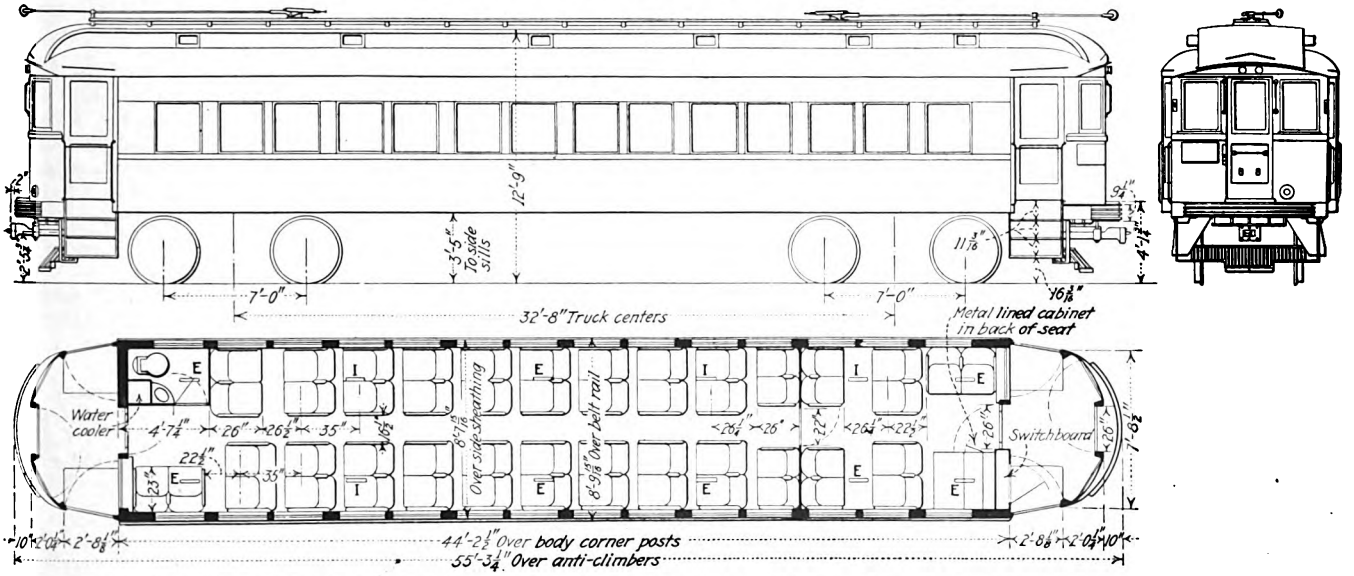
Net earnings of the American Car & Foundry Company and its wholly owned subsidiaries for the year ended April 30, 1927, fell short of the amount necessary for the payment of the $6 per share dividend on the no-par-value common shares. W. H. Woodin, president, said:

In view, however, of the company's sound financial condition, the directors felt that the surplus might with safety and propriety be drawn upon for such difference. This accordingly has been done, and the reserve for dividends on the common stock remains intact.

The wholly owned subsidiaries of the company are American Car & Foundry Securities Corporation and American Car & Foundry Export Company.

Consolidated operating income, after making provisions for taxes, for the year was $7,837,528, a decrease of $1,437,044, and net income, available for dividends, was $4,593,377, a decrease of $1,509,521. After allowing for $2,100,000 for dividends on the company's 7 per cent preferred stock, the amount remaining for the common stock fell short by $1,106,623 of the required

Fifteen De Luxe Cars for C., A. & E. Scheduled for Delivery Aug. 1



Plan and elevation of one of fifteen interurban semi-steel cars which the Chicago, Aurora & Elgin Railroad will shortly operate on its Fox River Valley line. This is said to be a departure in de luxe unit construction

Aug. 1 is the date now set for delivery of the fifteen new type de luxe interurban cars to be introduced by the Chicago, Aurora & Elgin Railroad, Chicago, Ill., as the result of an order placed Jan. 1 with the Cincinnati Car Company, Cincinnati, Ohio.

The new rolling stock will be of semi-steel, instead of all-steel, construction as previously announced by ELECTRIC RAILWAY JOURNAL in its issue of Feb. 5. Each unit will cost $39,000 and is to be equipped with a combination straight and automatic air brake system, plush seats and toilet and smoking car compartments. An interior finish of mahogany, exterior color scheme of maroon and Baldwin equalizing bar trucks are some of the refinements. The units will have a total weight of 102,000 lb. and are to be equipped with four General Electric inside hung motors, rated in an earlier statement at 150 hp. Accommodations for 54 seated passengers have been specified. The western suburbs of Chicago and the Fox River Valley line of the company will be served by these units, the first specifications for which have just been released by the Cincinnati Car Company.

Number of units	15
Type of unit	Two-man, motor, passenger, interurban, double end, double truck
Number of seats	54
Builder of car body	Cincinnati Car Co.
City and state	Cincinnati, Ohio
Date of order	Jan. 1, 1927
Date of delivery	Aug. 1, 1927
Weight, total	102,000 lb.
Bolster centers	32 ft. 8 in.
Length over all	55 ft. 3¼ in.
Length over body posts	44 ft. 2½ in.
Truck wheelbase	7 ft. 0 in.
Width over all	8 ft. 11 in.
Height, rail to trolley base	13 ft. 0 in.
Window post spacing	35 in.
Body	Semi-steel
Roof	Monitor
Doors	End, swinging
Air brakes	Westinghouse AMU
Armature bearings	Plain
Axles	5½-in. x 10-in. heat-treated steel
Car signal system	Consolidated
Compressors	Westinghouse D-3-F
Conduit	Metal
Control	General Electric type M
Couplers	Ohio Brass Form 19
Curtain fixtures	Morton Manufacturing Company
Curtain material	Pantasote
Destination signs	Hunter
Finish	Paint
Floor covering	Linoleum and rubber
Gears and pinions	General Electric grade M
Glass	Plate
Hand brakes	Peacock
Heat-insulating material	Salamander
Heaters	Railway Utility
Headlights	Portable
Headlining	Steel
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Safety Car Heating & Lighting Co.
Motors	Four General Electric, inside hung
Painting scheme	Maroon
Roof material	Canvas and wood
Sash fixtures	Curtain Supply Company brass
Seats	Hale-Kilburn No. 900
Seat spacing	35 in.
Seating material	Plush with leather trim
Slack adjusters	Smith-Ward shim
Steps	Stationary
Step treads	Irving Steel Works
Trolley retrievers	Knutson No. 5
Trolley base	U. S. 20-C
Trolley wheels	Moccasin, 6 in.
Trucks	Baldwin equalizing bar type
Ventilators	Railway Utility Company
Wheels	Rolled steel, 37 in. diameter
Wheelguards	Steel pilots
Special devices	32-volt multiple lighting with 175-amp.-hr. battery charged by motor-generator set

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amount to pay the $6 dividend on the common stock, which amounts to $3,600,000 annually.

The report, while not naming the J. G. Brill Company directly, which is controlled through the Brill Corporation of Delaware by American Car & Foundry, indicates the management expects to be highly successful in the motor car and bus building field. The report says:

Purchases by the railroads of new freight car equipment during the year have been in disappointingly small volume.

Naturally, this inactivity in buying brought with it a competition even more keen than usual among car building concerns bidding for the business offered, with the result that the profit margin, none too broad at the best, was still further narrowed.

The report then makes its reference to the Brill activities as follows:

The company is developing a field for its activities and the utilization of its experience and facilities more varied than that offered by the building of freight and passenger cars of the ordinary type, but nevertheless lying within the general domain of transportation and therefore calling for no departure from the underlying purposes of the company's organization. This particular field of endeavor is the manufacture and sale of automotive vehicles, buses, trucks and motor-driven rail cars—instrumentalities the development of which as supplementary to the service given by the established steam and electric railways will undoubtedly solve many of the problems which have long confronted railroad management in various sections of the country.

Copper, Lead and Zinc Prices Advance

The week ended July 20 has been unusually active in copper, zinc and lead; consumers have bought tin in good volume; China and India both have bought silver; and without exception prices for each of these metals are higher than a week ago. Antimony, quicksilver and platinum continue dull, with little change in price.

Copper has continued its upward course, begun three weeks ago, with a further increase in the volume of business, which was the best for seven weeks. On July 20 prices ranged from 12.80 to 12⅞ cents. Sellers seem confident that buyers are in need of metal for early requirements, and in this view they are supported by the fact that the great bulk of the recent business has been for August delivery. A factor in the strength of the domestic market is the unusually active buying abroad, done during the last week at the fixed price of 13 cents c.i.f. Germany is the outstanding customer, but France and Great Britain have participated. Standard copper has advanced sharply in London.

On July 20 the American Smelting & Refining Company advanced its contract price for New York lead from 6.20 to 6.30 cents following a week of excellent business in the lead market and an advance of almost a pound sterling in the London quotations.

The London zinc market, as in the case of copper and lead, has stiffened during the week and buying in the domestic market has been active, with prices advancing from day to day. Part of the buying was of a speculative character, but galvanizers and brass manufacturers also bought. Quotations for high-grade zinc for prompt delivery in New York continue nominally at 8 cents per pound.

The tin market has been active, as has the market for the other metals. Prices, however, show little change, having ruled around 64 cents for prompt Straits most of the week.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	July 19, 1927
Copper, electrolytic, cents per lb.	12.53
Copper wire, cents per lb.	14.50
Lead, cents per lb.	6.21
Zinc, cents per lb.	6.55
Tin, Straits, cents per lb.	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.275
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.02
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings. Kansas City, net tons	2.67
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.15–5.20
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.2
White lead in oil (100-lb. keg), N. Y., cents per lb	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.66

ROLLING STOCK

IOWA SOUTHERN UTILITIES COMPANY, Centerville, Iowa, has ordered three more Mack city type buses. They will be 25-passenger, four-cylinder buses, 196-in. wheelbase.

TRACK AND LINE

PHILADELPHIA, PA.—A low bid of $7,269,880, made by a New York firm, was offered on July 19 for the extension of the South Broad Street subway, Philadelphia. The bid was $143,000 lower than the offer made by the contractors who built much of the nearly completed North Broad Street tube. This firm offered its bid under the name of the Keystone State Corporation, the new title of the company. Patrick McGovern, Inc., the firm which built the North Broad Street subway from Clearfield Street north, was underbid by the New York firm by $687,000. Director Ehlers said he would take the six bids offered under consideration. Under the terms of the contract, the tube from City Hall to a point between Lombard and Kater Streets must be ready for tracklaying by Aug. 1, 1929, allowing two years for construction. It must be ready for operation by Feb. 1, 1930. The contracts for station construction, tracklaying, electrical equipment and plumbing work are separate from the tube construction contract.

TRADE NOTES

STEVENS & WOOD, INC., engineers and constructors, 120 Broadway, New York City, have been retained by the Board of Transportation of the city of New York to study, investigate and report on the method to be adopted to provide electric power for the operation of the new municipally owned independent rapid transit lines.

G. E. ACKERMAN has accepted a position with the Chicago sales department of the Electric Service Supplies Company, Philadelphia, Pa. He will handle railway lighting and industrial business in the state of Indiana and southern Michigan. Mr. Ackerman was formerly connected with the International Cash Register Company and the Line Material Company.

BIG THREE WELDING & EQUIPMENT COMPANY, Fort Worth and Houston, Tex., Texas and Oklahoma distributor for "Stagle-Arc" welders, manufactured by the Lincoln Electric Company, Cleveland, Ohio, announces the opening of its third warehouse branch at No. 1 North Frankford Street, Tulsa, Okla.

R. P. DUNMIRE, formerly connected with the Westinghouse Electric & Manufacturing Company for eighteen years, in the insulator and high-tension department, and later district manager of the Erie Malleable Iron Company, is now engaged as insulator specialist for the Electric Service Supplies Company, Philadelphia, Pa.

H. E. PALMER has recently joined the sales force of the Electric Service Supplies Company, Philadelphia, Pa. Mr. Palmer's former connections included several years in construction work with the Development & Machine Company, the Philadelphia Electric Company's supply department and the Erie Malleable Iron Company. Mr. Palmer will cover the states of Maryland, District of Columbia, Virginia and West Virginia.

ADVERTISING LITERATURE

COPPERWELD STEEL COMPANY, RANKIN, PA., recently issued another insert for its looseleaf binder for engineering data, "Copperweld." The new sheets deal with overhead construction materials.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., is adding to its loose-leaf advertising folders the following sheets: GE squirrel-cage motors, 500 series; CR3204 drum-type control equipment; type MT control equipments for d.c. series-wound crane hoist motors CR4422-A4 and CR4422-L4; hand starting compensators CR1034-K17, K-21 and K-22 dead-front cabinet type; CR-9511 shoe-type solenoid brakes for direct-current motors; automatic switching equipment with 600-volt synchronous motor-generators in railway service and CR1034-K1 hand starting compensators for squirrel-cage induction motors.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, July 30, 1927 *Number 5*

Are New York's Transportation Troubles Merely Postponed?

NEW YORK CITY will not experience a strike on the lines of the Interborough Rapid Transit Company at this time. The future, however, is not so certain. It is a situation bedeviled with politics, personal animosity and chicanery. And out of it most anything is likely to come. A spade should be called a spade. The Amalgamated is hunting big game. It did so last August and lost, but that has only whetted its appetite. It will not hesitate again to make the men its catspaw if it thinks it can achieve its ends. However good the record of that organization elsewhere, the recollection of New Yorkers of the previous machinations of that body does not bode well for the future with it in the saddle. The New York newspapers realized this and they emphasized in unmistakable terms the fact that the public's memory was sufficiently acute to go back twelve months.

There is little doubt that the proselyting activities of the union among the Interborough employees were encouraged when Samuel Untermyer, as special counsel for the Transit Commission in that body's investigation into the possibilities of unification of the local lines, made a violent and apparently irrelevant attack upon the present labor policy of the company. The work that the Mayor did at the eleventh hour in averting the strike nullified some of the harm Mr. Untermyer did, but more than action of this kind, expedient as it was, is needed to deal constructively with this situation. The Mayor is an astute politician. That is shown by his binding the Amalgamated officers to promise that, so far as it was in their power, they would not raise the issue of union organization until the city's plan of unification is completed. This was a master stroke so far as the attenuated political promise is concerned. It implies everything and says nothing at the same time. On the other hand, President Hedley of the Interborough was a little too direct. He presented his case to the Mayor powerfully by letter, but was content with that. He would undoubtedly have strengthened public sympathy for his company had he gone in person to the City Hall and confuted the pretensions of the labor leaders. This he could have done very effectively since he was reinforced with figures to show that the employees were content with present conditions, that only recently their wages had been advanced and that an economic barrier is fixed irrevocably upon the operating companies by the limitation of the 5-cent fare.

This last, in fact, is the nub of the whole matter. There has been a gross lack of appreciation on the part of the municipal authorities of the transportation needs of the city and the efforts of the management to fulfill those needs. With anything like adequate co-operation between the city authorities and the transportation officials rapid transit conditions could be greatly improved in the interests of the public. Such co-operation on the part of the city has not been forthcoming. The management has gone far in its efforts to treat its employees fairly and to give the best possible service under existing conditions. The primary trouble with the New York situation is not with the railway management; it is politics, petty and unusually partisan.

Short Cycles for Signal Lights Speed Traffic

REGULATION of traffic by means of signal lights has progressed so rapidly of late that keen interest exists today in questions that were unheard of a few years ago. In this category is the matter of the proper duration of the cycle of operation. Although great diversity exists in the timing of the signals now in use, opinions of close students of traffic problems generally favor the short cycle.

On Fifth Avenue, New York City, where the original installation of these signals was made, a long cycle is still used, 120 seconds being allowed for through traffic and 60 seconds for cross movement with no appreciable "dead" intervals, making a total of 180 seconds. Atlantic City uses an even longer cycle; 150 seconds for through traffic and 90 seconds for cross movement, or a total of 240 seconds. Cycles ranging from 70 to 125 seconds are common. On the other hand, the cycle of operation for many of the signals in Chicago is less than 50 seconds. Cincinnati, New Orleans, San Antonio and Duluth are other cities where cycles of less than one minute duration are used.

Experience in Atlanta demonstrated that a 63-second cycle was notably more efficient than cycles of 115 and 78 seconds, which were tried first. Similarly, when signals were first installed in Cincinnati they were operated on the synchronous principle with a 90-second cycle. They were then changed to the alternating or wave plan with the same cycle of operation. This failed to show much improvement and the cycle was therefore shortened to 50 seconds. This has proved satisfactory for both automobile and street car traffic.

The type of signal control has an important bearing on the length of the cycle. With synchronous control it is necessary to have a comparatively long cycle to permit travel for a reasonable distance between stops. Otherwise much valuable time would be lost stopping and starting, even though the proportionate duration of red and green lights was the same. With the usual type of alternating or wave control, sometimes called the "platoon" system, it is necessary to allow equal periods for through and cross traffic. This again results in a long cycle. A recent development is a plan whereby alternate groups of lights would be operated on separate circuits. Such an arrangement would make it possible to have different periods for cross and through traffic and consequently a shorter cycle of operation. With co-ordinated control the length of cycle has a definite relation to the speed of vehicular movement. Often,

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however, either of two cycles can be used for practically the same speed. On Michigan Boulevard in Chicago, for example, it was found that either a 60-second cycle or a 100-second cycle could be operated satisfactorily, but there was no intermediate length that would serve nearly so well.

Experience shows that short cycles giving frequent changes cause a minimum of interference to vehicular movement and are to be preferred to the longer cycle except where the traffic is extremely dense. Since it is apparent that the usual type of synchronous control is not well suited to produce this result, more widespread use of alternating or co-ordinated control is required to expedite traffic movement.

"As a Man Thinketh in His Own Heart—"

FOREMAN training, or what might better be termed supervisory training, is growing by leaps and bounds. Industry after industry is seeking a better understanding of its merits. It has been given consideration at annual gatherings of street railway men and it will be further developed at the A.E.R.A. convention next October.

Like every other movement for good, it has suffered by not being thoroughly understood. First and foremost, its object is not to educate in the sense in which education is accepted today. To explain this assertion, one turns to that powerful critique of modern education, Dean Martin's "The Meaning of a Liberal Education."

In discussing liberal education vs. propaganda, he writes:

> Although the educator and the propagandist are both concerned with the dissemination of information, they have nothing else in common. They use contrary methods and they strive for opposite goals. The propagandist is interested in what people think, the educator in how they think.

The first, explains Mr. Martin, "strives for effect, the latter for an open mind." This latter objective is what the true exponent of foreman training desires. It is the goal which few companies have reached, because they have employed a propagandist method instead of that of the true educator. Foreman training as set up in most industries has as its base a certain "primer" dealing with the various administrative situations which required expert supervision. If the group is taught this by rote, experience has proved that this is propaganda, a studied effort—quickly recognized by the pupils—to convert the group to a straitjacket "you-must-do" method of supervision that ignores the human equation. Quite the reverse is true if the "primer" is employed—sometimes only casually referred to—to cause individual thinking and expression; a rationalization of essentials to the exigencies of separate situations, in order that the main objective may be reached in accordance with the best methods of the industry. This definition is difficult to understand unless one sits in on a "real" foreman conference and hears the result of what might be called "self-starter" questions.

The responses are amazing. Bill, who has always appeared to be a plodding personage, suddenly launches forth a counter question, presents a situation, analyzes a method, that jars his instructor and confrères and makes the "primer" look sick. Bill is thinking about a mutual problem in a different manner and he often proves that what is sauce for the goose may not be sauce for the gander.

And again, foreman training cannot be launched in a hurry. Those who "put it over" must undergo long training. Their employers must have as their goal education and not propaganda—not converts but thinkers. And so experience has shown that the supervisory training should start at the top; that is, with presidents, vice-presidents, general managers, etc. In order thoroughly to permeate the organization it should take the downward course. Incidentally the writer has known of cases where the highest officers first scoffed and then remained to wonder, sweeping aside other problems in order to attend the classes regularly.

With this experience to guide it and two months ahead in which to pick the men who will attend the conference at Cleveland, the industry should do some serious thinking on this question. Foreman training cannot be put aside, because it has conclusively proved its worth and it is one of the great forward steps for super industry. Like marriage, it must be undertaken "advisedly." Those who promote the classes must remember that "as a man thinketh in his own heart so is he." A parrot may learn, but he doesn't think.

It Takes More Than Merely Being Right

IT STANDS to reason that the electric railways' case must be sound before progress can be made in obtaining a favorable verdict on any one of the many points upon which public officials must be approached. But whether the point at issue is rate of fare, paving, franchise terms, taxes or what not, it is not sufficient merely to be right.

"Public officials are responsive to their bosses, the people," said an executive recently in speaking before a gathering of railway men. He went on to explain that it is hard to understand that though public officials will sometimes agree frankly that the railway is entirely justified in what it seeks, they will at the same time do nothing to grant the company's contention.

There is a tendency to condemn the man in public office for his lack of backbone; for his subservience to the public he represents. It does not suffice to convince city or regulatory officials that the railway's case is sound. The public—their bosses—are the seat of final authority and the railway executive can accomplish little until he has made relief for the railway popular instead of unpopular in the public mind. Regardless of whether or not this situation is as it should be, the fact remains that under present conditions the public official, particularly in municipal affairs, is very responsive to what he thinks is popular or unpopular with his constituents, and on his ability to win support for his action depends the tenure of his office.

Something of the other fellow's viewpoint is needed to avoid disheartenment at what seems a very unfair situation. After all, the average railway manager also seeks the good will of those who employ him. His action in a given situation is not always entirely in accord with his own personal views. He is subject to the opinion of his own bosses, and he doesn't act in opposition to their views very long.

Is it, then, impossible to win that co-operation which the average railway needs so badly? Not at all. It may seem like a long road, but the industry cannot reasonably expect to overcome in a year or two the effects of its sins of omission and commission during a decade. True, there are some public officials who are grossly unfair. There are some who are inclined to suck the last drop of

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vitality from their railway in the misguided effort to keep alive an issue on which so many of them and their predecessors have ridden into office in the past.

There is only one way out. That is the path of service. The public is not interested in other peoples' troubles—even when they are those of a vital public servant. Public interest must be won by improvements that will appeal to the average man on the street. Public confidence can follow only an adequate demonstration of *good* faith. Expertly planned publicity through many available channels must follow, not precede, the other steps and must be used to reach the public mind and impress upon it the facts. When all these things are done adequately enough and are persisted in long enough, the public can be "sold" on its railway. Then and then only can a full measure of co-operation from public officials be expected. Then the railway is in position to speak on a footing of equality, as one public servant to another. Then the railway may demand what in too many cases at present it requests—action in the interest of the public and the community welfare.

Germany Makes a Contribution to the Science of Electric Railway Statistics

ONE of the most important steps ever taken to improve the scientific operation of electric railways was the adoption of a standard classification of accounts. This classification enables the results of any road to be compared with those of another with the assurance that both have been compiled on the same basis.

The same argument holds for the use of a standard classification of statistical data, but here it insures not only the same basis for the statistics but it brings about a uniformity in the data prepared. Otherwise, some companies would make public one set of figures, and others another set, and it would be impossible to compare the properties in all particulars.

Operators in America who have felt the need for greater standardization in statistical data will be interested to know that such a classification has been used for some time in Germany. The suggester of this classification, Dr. Mattersdorf, manager Hamburg Elevated Railway, is well fitted for the task as he is not only a skilled operator and engineer but was a pioneer in and has always been an ardent advocate of scientific methods in the analysis of electric railway statistics.

While many foreign annual reports, including the British, make a feature of the inclusion with the financial figures of pertinent data on operation, the publication of corresponding figures in the annual reports of American electric railway companies is rare. In this respect electric railways differ from the steam railroads in this country, which usually include in their annual reports several pages giving tons of freight of different kinds carried, types of locomotives, and similar matter.

In electric railway printed reports, a commendable increase of financial information is being published, particularly in regard to the details of operating expenses. The time is past when one line of type was considered adequate to give to operating expenses, though three or four pages might be taken up with the balance sheet. Further improvements in the way of better annual reports could well be made in giving the stockholders a table of the principal statistical averages from operation, by which they can more easily make performance comparisons with other properties of a like size operating under similar conditions. For such as desire to work along these lines, Dr. Mattersdorf's list of statistics may offer helpful suggestions.

European Car Advertising More Diversified but Less Efficient than Ours

INSTRUCTION as well as entertainment will be found in H. Samuelsen's report on "The Sale of Advertising Space" on continental tramways, published elsewhere in this issue. Even those whose acquaintance with European trolleys is confined to flashes at the moving-picture theaters know that advertisements are carried outside the cars in a profusion undreamt of in publicity-proud America. However, few of us realize that the foreign tramways seem ambitious to plaster every available area with an appeal to buy this or that.

It seems to us in America that one of the reasons in Europe for going beyond the ceiling and bulkhead car cards and the dasher spaces usual here is a lack of appreciation as to how to make advertising most effective. Mr. Samuelsen's paper indicates that even the majority of the systems, which use professional advertising agencies, indulge in this orgy of diversity.

American experience has proved that the first essentials of advertising success are concentration and attractive copy, with its frequent change. An inside advertisement tends to receive the concentrated and favorable attention of the rider when he is seated and can look at cards large enough to be read with ease. He will be less favorable toward an article advertised on a car strap or on a seat shield that cuts into the small of his back.

A step riser is hardly a safe place for an advertisement. If the advertisement is novel enough to be read it may be distracting enough to cause an accident. This was appreciated by one of our rapid transit companies in rearranging the advertising in its stations recently. Instead of permitting advertisements to be placed wherever space offered, the company took care to keep them away from stairways or other places where distraction would be a hazard.

Too many kinds of advertising spaces defeat the objective of maximum revenue, aside from the question of safety first. Just as plenty of white space around an advertisement enhances its value, so does a car card or platform dasher gain if there are not too many other varieties of publicity in competition.

The second essential, attractive copy and its frequent change, depends partly upon standardization of card and placard sizes and partly on extent of circulation. In this respect America is far ahead of continental Europe, largely because car advertising here is handled on a national scale. Quantity production not only permits a national advertiser to save on art and printing costs, but also makes it possible for the local florist, hatter or confectioner to use highly attractive cards arranged to take his imprint. Nothing like this has been developed on the Continent, where the same article is advertised through scores of small agencies or by home talent.

Finally, it is apparent from Mr. Samuelsen's complaints that his property was driven to handle advertising direct because there was no agency whose sole medium is the electric railway. Such a complaint would be impossible in America and Great Britain, where car and railway structure advertising has been built up scientifically by agencies which make no use of any other medium.

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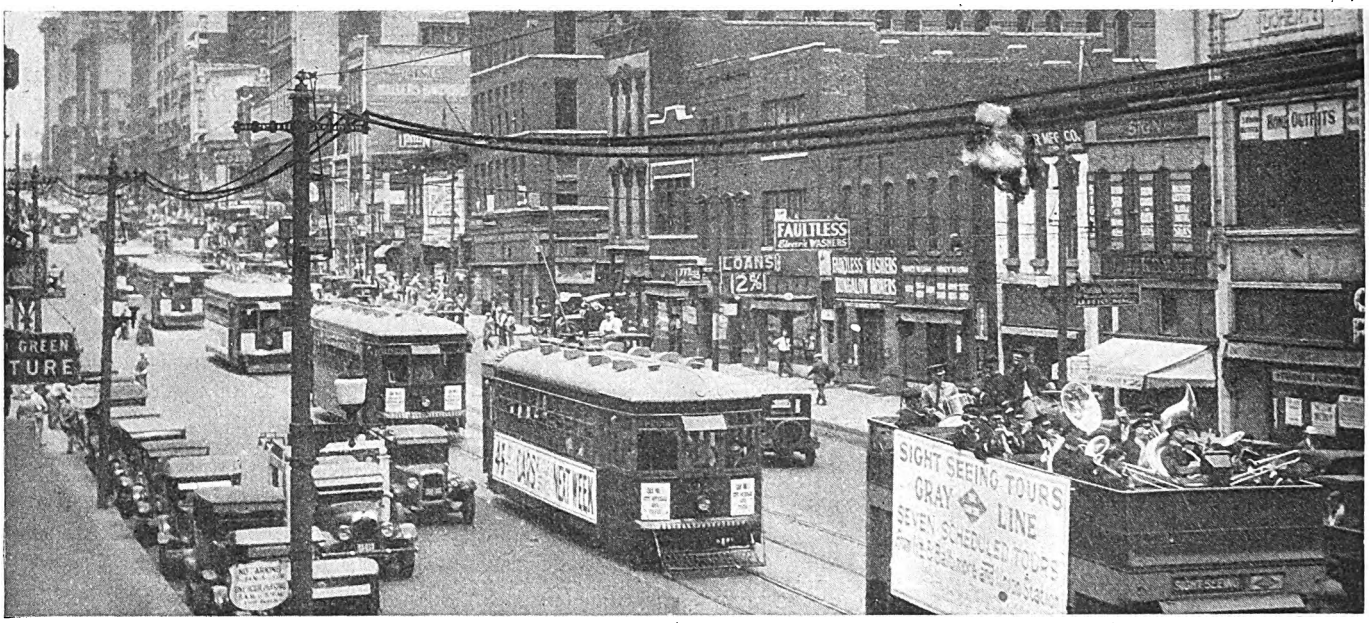
Kansas City

Meets the Silk Urge

Extensive car modernization program was introduced to the public by a parade of seventeen of the remodeled cars, headed by the company's band atop a double-deck coach. A million and a half dollars will be spent in the remodeling program



Headed by the company's band the parade moved through the downtown business district of Kansas City

WHEN the car rehabilitation program of the Kansas City Public Service Company is completed early next year, 746 cars will be completely remodeled at a cost of approximately $1,500,000. These cars are being equipped with many new features to attract car riders. For color a real fruit combination scheme of plum with apricot shading on an orange background, as submitted by the Municipal Art Commission, has been adopted.

Through the local newspapers and in display advertisements, the public has been hearing about these modernized cars for some time. The first seventeen were completed during the first week in July, and were introduced to the public in a parade through the city. City officials, newspaper editors, club presidents, and important local personages filled the seventeen cars, and the public lined the streets to get a first glimpse of the cars it had been hearing so much about. A band composed of employees of the Kansas City Public Service Company atop a double-deck coach headed the procession. During the afternoon and the day following several of the cars were placed on sidings at various locations and the public was invited to inspect them. Instructors were placed in charge of each car to explain novel features, and 150,000 pamphlets were distributed that gave brief information of the features included in the modernized cars, a brief summary of the reconstruction program that will be carried out, together with suggestions for passengers for using the new service to best advantage.

One of the biggest handicaps under which the new company is working is the haphazard layout due to ownership of the original lines by competing companies. The Kansas City Public Service Company now serves a district with an area of 98 square miles with 318 miles of track. For several years the number of revenue passengers has been decreasing steadily, and during 1926 11,000,000 less revenue passengers were carried than in 1922. Emerging from a long receivership last October, the new owners found the property run down and in need of repairs. Many miles of track needed replacement, cars needed overhauling, viaducts had to be built and buildings improved. It is estimated that approximately $6,000,000 will be needed to put the property in first-class condition. An extensive rehabilitation program was started, and at the end of 1927 approximately 27 miles of track will have been rebuilt, many buildings remodeled, and the car rehabilitation program started.

The new cars are being remodeled at the Tenth and Lister Streets shops, and many interesting construction details are included in the first 45 which already have been turned out. Particular attention has been devoted to making the interiors comfortable and attractive. Linoleum tile flooring cemented to a base of builder's

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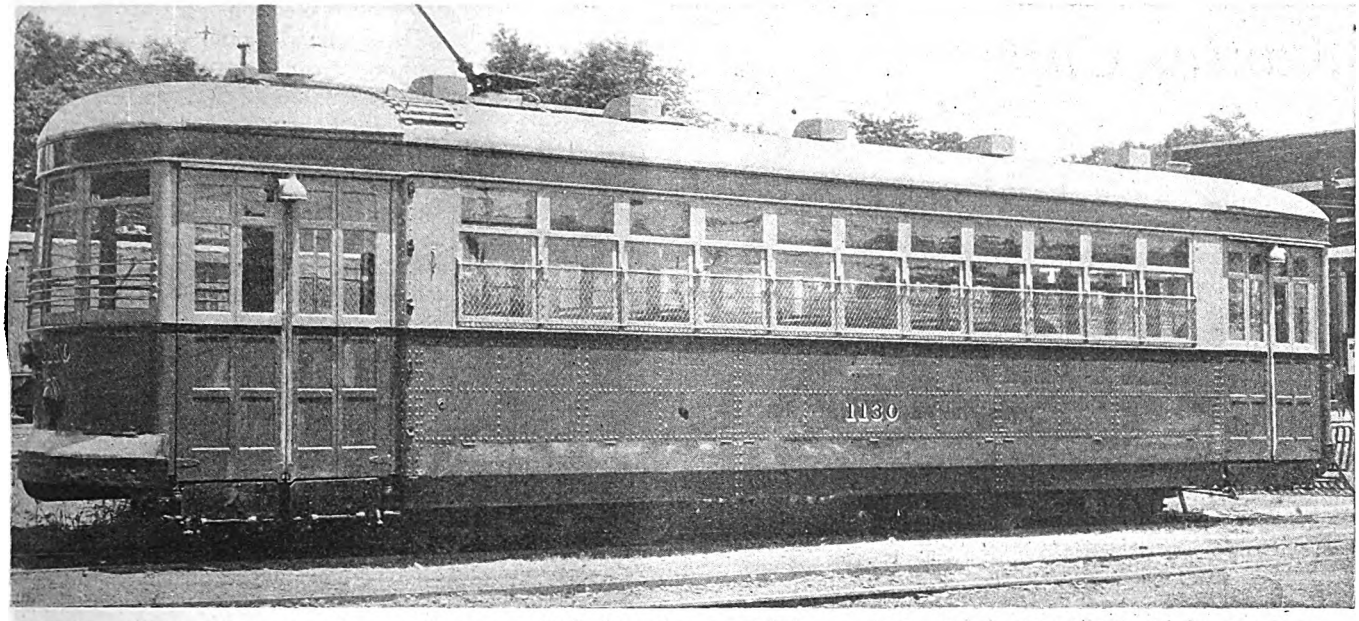


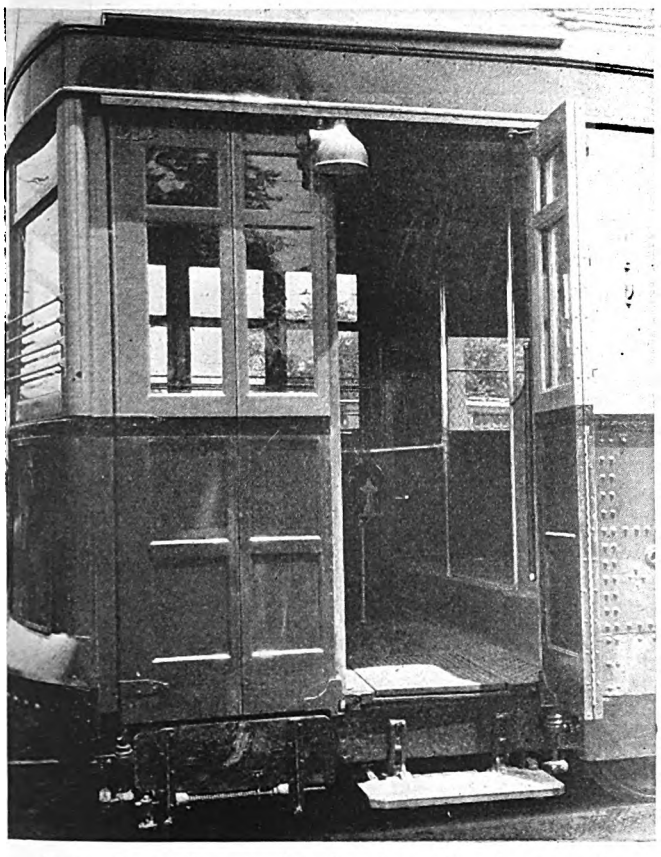
Comfort, safety and an attractive appearance are built into the remodeled cars of the Kansas City Public Service Company

felt and canvas covers the floor except the aisle, where a strip of flexible composition matting is laid. Vestibules have a metal insert rubber matting. This not only adds to the attractive appearance of the cars, but facilitates cleaning and will minimize accidents from slipping and falling. Seats are upholstered with maroon Kemi-suede placed over a felt padding. This material gives a much more sightly and comfortable seat than rattan and can be cleaned easily, and is less apt to tear clothing. Aluminum seat-end brackets are placed on longitudinal seats to prevent passengers sliding off when the car is being accelerated or retarded.

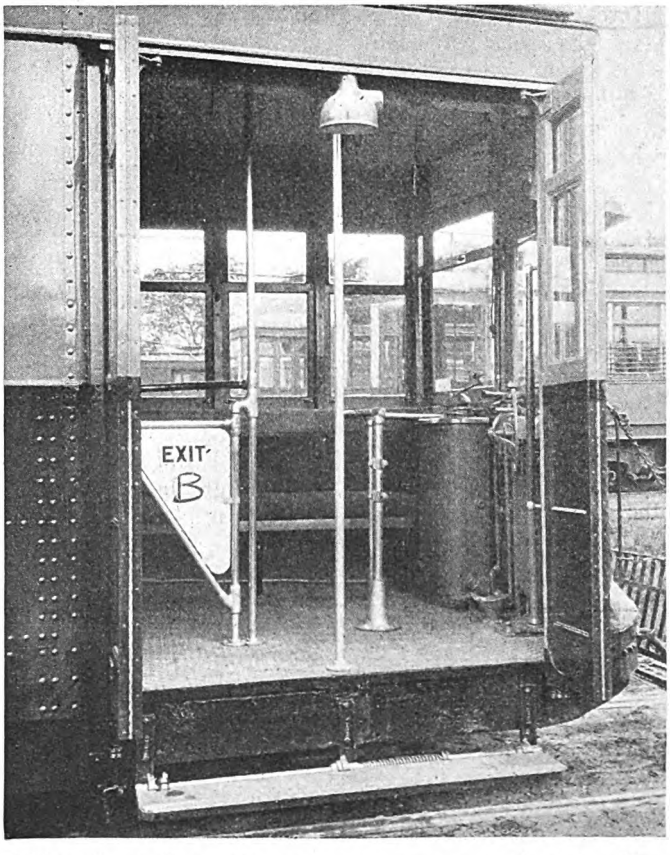
Frosted lamps will be used in the lighting system. There is a row of lighting fixtures directly over the center line of each row of seats. The 36-watt lamps used provide increased illumination and better light distribution than the previous arrangement, and also add to the appearance of the interior.

Sanitary rigid hand straps are provided for standees. The movement of these handstraps is crosswise of the car but they are held rigid against forward and backward movement.

On the exterior a low, rakish appearance which is now so popular in car construction is being produced



Automatic treadle controlled door is used for the rear exit and speeds passenger movement



Folding front doors give passengers more convenient boarding and alighting facilities

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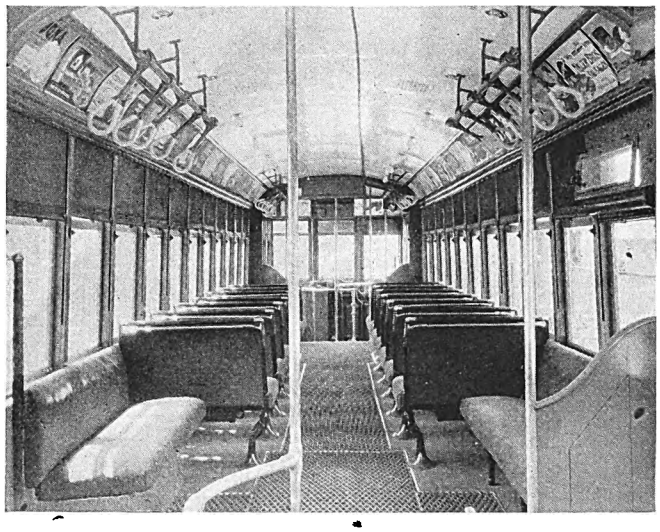


Upholstered seats, linoleum floor covering and flexible matting in the aisles add to the interior attractiveness

through the addition of skirts. These are constructed of Celotex, which is used because of its light weight and insulation qualities. The skirts are in sections so that they can be swung back for repairs, and are held in position by spring catches. Through this installation and the painting adopted a streamline effect is produced. A metal visor or sun shield adds to the appearance of the car.

The total width of entrance and exit doors has been increased. Folding front doors are used and both doors operate at the same time. The pneumatic door engines are controlled from the engineer's valve, or from a street faretaker's valve accessible from the outside. Treadle control is installed for the rear exit door. These changes provide increased schedule speed as there is less interference between streams of boarding and alighting passengers, so shorter length stops result. Improved air-brake and air door control *include the latest safety car devices.*

The improved controller equipment includes line breakers to open the motor circuits underneath the car. New K-35 controllers replace K-14 previously used. In addition to the increased protection from arcing and control failures this equipment should result in reduced maintenance. Equipment operating the control and air brakes from the rear of single-end cars has been installed.

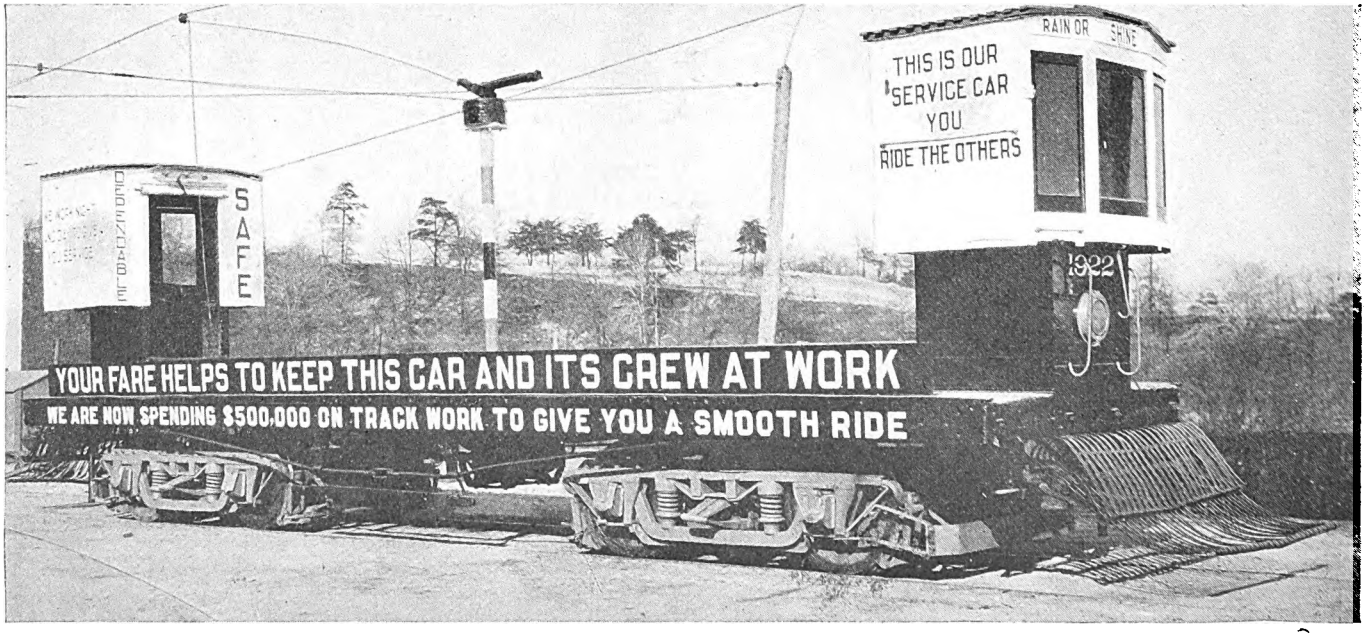
Some of the additional equipment which has been added includes thermostatic control for the heaters, late type intake and discharge ventilators, and air rectifiers to prevent freezing of air piping during winter weather.

The interior and exterior color schemes were submitted by the Municipal Art Commission after several colors had been tried out and commented on by the public. The general color scheme is orange and apricot trimmed with plum. The outside numerals are plum with apricot shading on an orange background. The lower part of the car body below the arm rail and the letterboard between the upper side and roof are orange, while the sash and posts from the arm rail to the letterboard are apricot. A narrow band of plum color is used on the molding. Plum trimming is also used on the nose irons of the front and rear vestibule. Skirts are painted orange to match the car body with a broad band of plum color around the bottom. The roofs are painted a light gray. The interior finish is a drab green below the arm rail and a slightly lighter shade of drab green above. The headlining is white.

Richmond Service Cars Act as Publicity Agents

SERVICE cars of the Virginia Electric & Power Company of Richmond, Va., are playing a dual rôle for the company in acting as advertising and publicity agents in addition to performing their regular service duties. Brightly painted and bearing numerous slogans and statements they make a striking appearance, certain of attracting the public's eye.

The cabs of each car are painted white and bear statements such as: "This is our service car—you ride the others," "We work night and day to give you service," and "Rain or shine—service." The body of the car is painted a very dark red and bears statements extending its full length calling attention to the importance of the maintenance work. These will be seen in the illustration.



The advertising contribution of the Virginia Electric & Power Company's maintenance of way department

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With Its House in Order C., H. & D.

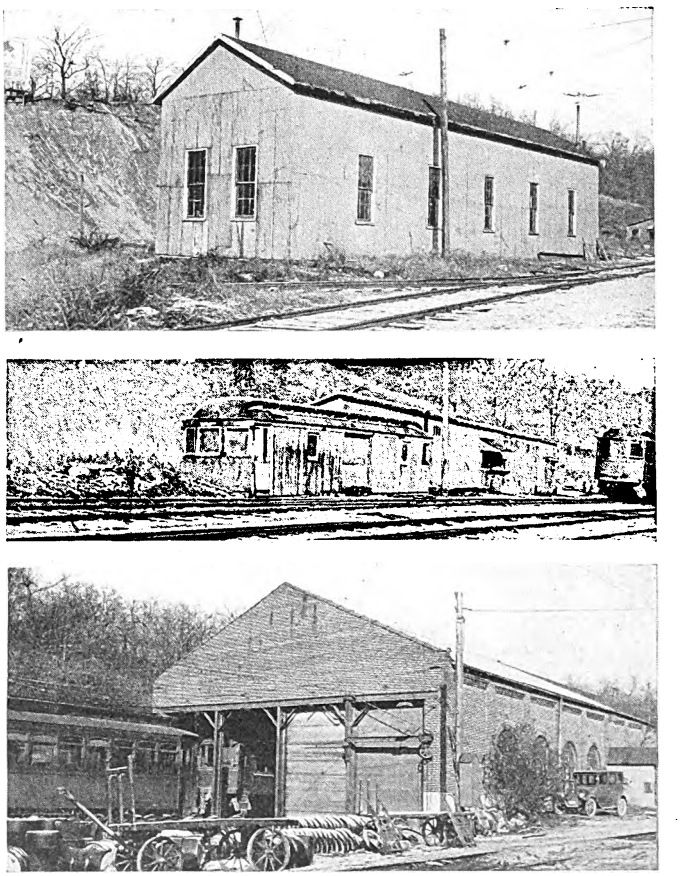
Goes After Business

Increased passenger and freight revenue follow improvements in facilities. Track rehabilitation, new power system, new freight rolling stock and enlarged terminals pave the way for active business-getting campaign

This is the third and final article on the rehabilitation of the Cincinnati, Hamilton & Dayton Railway. The previous articles, appearing in the issues for July 16 and 23, covered the new policy of the property, the financial reorganization, history, and the new passenger equipment.

EVERY indication points toward success of the effort to build both passenger and freight revenues on the Cincinnati, Hamilton & Dayton Railway to a point where sufficient income will be obtained to show not only an attractive return on the new money put into the property, but also a substantial recovery for the securities that accepted a junior position in order to make the rehabilitation of the property possible. The methods used are discussed in the following paragraphs.

During the period from 1921 to 1926, consistent efforts made by the receiver to build freight revenues resulted in an increase of 104 per cent for the six-year period. During the first five months of 1927, while the rehabilitation was being pushed forward vigorously, a further increase of 31.2 per cent was made in comparison with the corresponding period of the previous year. This gratifying result was made possible by first providing adequate facilities to handle freight properly when it was offered, and then by an active effort to sell business for the road. Of the 40 new standard C.E.R.A. box trail cars that were purchased, fifteen were obtained in December, 1926, and 25 in January and February, 1927. The freight terminal at Cumminsville, in the outskirts of Cincinnati, was improved and enlarged with proper track facilities. This work was done in January, 1927. In February of this year the C., H. & D. put into service two extensions from its main line right of way into the Delco-Frigidaire plant of the General Motors Corporation. Over the southernmost of these extensions the company handles inbound freight and also provides special tripper service mornings and evenings for transporting workmen to and from the plant. The westernmost of the extensions gives access to the delivery end of the plant, in which identical facilities are provided as regards location for the C., H. & D. and the Big Four Railroad. Although the construction work necessary involved a considerable expenditure, from three to sixteen carloads of freight are moving out of this plant over the C., H. & D. every day, as the result of the enterprise displayed in building the spur.



A study in contrasts on the Cincinnati, Hamilton & Dayton Railway

The old, inadequate and run-down shops have been replaced by a large concrete and steel building of most modern construction.

The new management of the C., H. & D. has not been content merely to handle the freight brought to it. Shortly after the organization of the new company Richard

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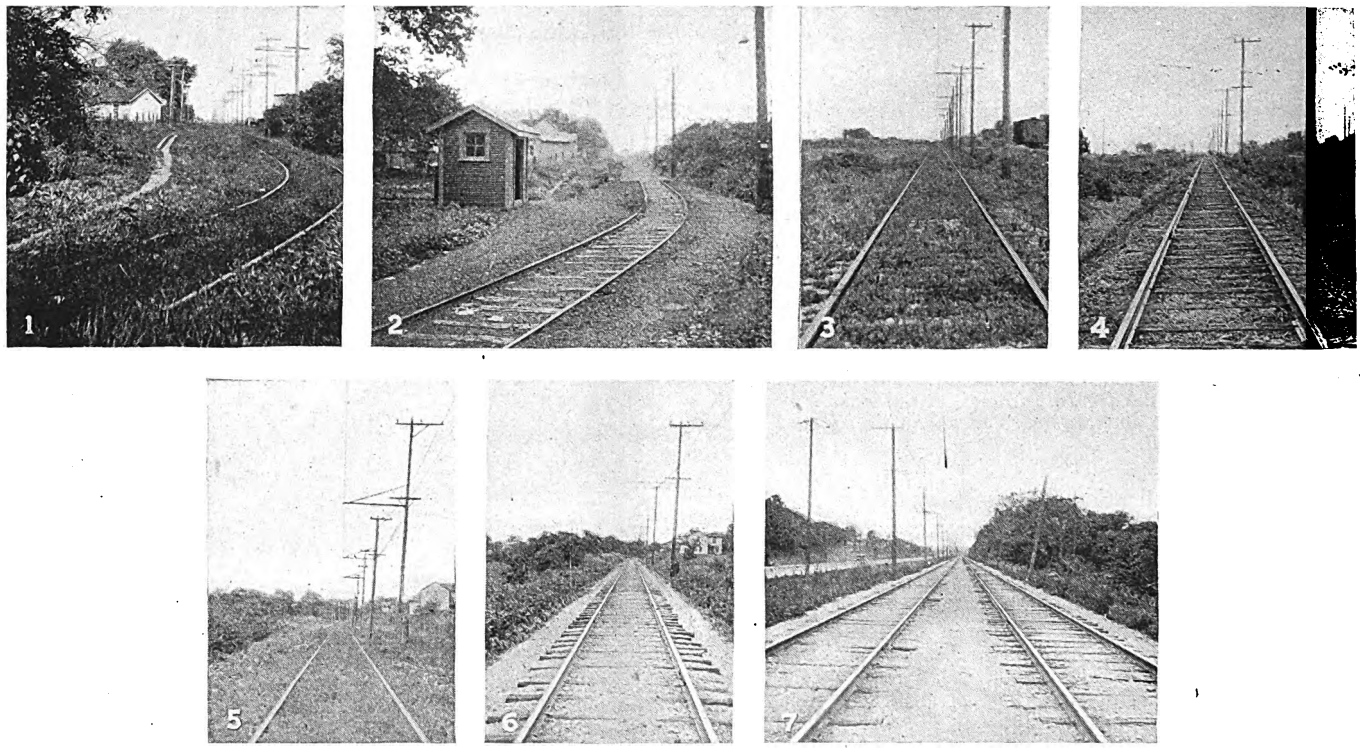
Breckenridge came with it as vice-president in charge of traffic. For many years he had been traffic manager of the Chicago, Aurora & Elgin Railroad and was largely responsible for the upbuilding of the freight business of that property when the same interests that now control the C., H. & D were in charge. Mr. Breckenridge opened offices in the Dixie Terminal Building in Cincinnati and an active campaign for solicitation of freight from that city was begun shortly. In addition C. M. Byrne, who was retained as traffic manager with offices in Dayton, was made responsible for the active solicitation of freight on the northern end of the line.

Within a few days the company will open a down-



Rehabilitation has changed the C., H. & D. from a grass-grown streak of rust to an efficient transportation property

1 and 2—Looking north on private right-of-way entering Overpeck—before and after

3 and 4—The result near Busenbark after three years of track rehabilitation

5 and 6—North of Middletown a collection of weeds and wild flowers has been transformed into a railway right-of-way

7—A stretch of double track on private right-of-way between Miamisburg and West Carrollton after rehabilitation

town freight depot in the Cincinnati terminal warehouse in the heart of the wholesale district, from where less-than-carload shipments will be hauled by motor truck to the company's freight terminal at Cumminsville, in the outskirts of Cincinnati. It is believed by the company that this down-town terminal, together with the active and aggressive solicitation of freight in Cincinnati, will lead to a substantial increase in the volume of business moving into and out of the city.

In addition to this the company has greatly increased its business through a contract with the Universal Forwarding Company by which extensive freight facilities were provided for that shipper in Cincinnati and interchange through rates were established by the C., H. & D. with connecting carriers to the large shipping centers in the Central Electric Railway Association territory, such as Cincinnati, Detroit, Cleveland, Toledo and Mansfield. This alone has added from six to nine carloads of freight per day in and out of Cincinnati.

Interurban passenger revenues on the section of line between Dayton and Hamilton fell off by 1925 to a figure approximately only 85 per cent of that in 1921. On the division from Hamilton to Cincinnati the showing was even worse. Here the passenger revenue in 1925 was only 67 per cent of that in 1921. The valiant effort made by the receiver to improve service by rehabilitation of track and improvement of the power supply enabled the Dayton to Hamilton division to beat down the bus competition that had existed between these two points. Competition was practically eliminated on this division as the result of improvements made in service on the railway, even before the present general rehabilitation program was completed. The increase in passenger revenue of 20 per cent in the city service at the Dayton end of the line during the first six weeks of operation of the new cars, as outlined in the JOURNAL last week, augurs well for the general result on this division, now that the new interurban as well as the city cars have finally been put in service.

Due to the fact that the Cincinnati terminus of the line is 5 miles from Fountain Square in the heart of the city, bus competition still exists on the division between Hamilton and Cincinnati. There are two improved hard surface roads between the terminals on this division. One of them runs parallel to the C., H. & D. tracks. Although the bus line paralleling the railway over this road has been in the hands of a receiver two or three times in the last three or four years, it still continues to operate, and according to the railway management has been responsible for the serious drop in revenues on this division. Railway passenger revenues between Cincinnati and Hamilton during 1926 were 5 per cent lower than in 1925, and were only 61 per cent of what they had been in 1921.

Now that new equipment is available, faster schedules

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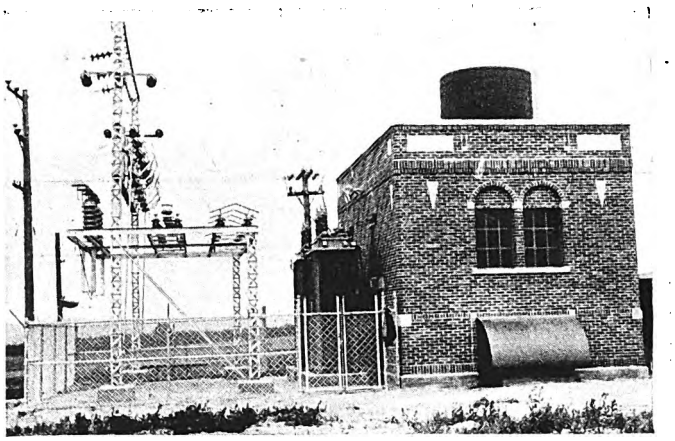
will put the railway in a better position to win back this lost riding. Service on the southern division has been increased so that there is a car every 30 minutes instead of once an hour as heretofore. Buses are operated by the railway from Fountain Square to its Cincinnati terminus. These meet every train so as to take passengers to the heart of the city. It is anticipated that the bus competitors, who have been losing money in their operations while at the same time depleting the railway revenues, will find it impossible to continue in the face of the improved railway service that is being offered. The net result is expected to show a decided improvement in the railway passenger revenues on this division.

Track Improvements

When the new management took charge of the property, considerable track rehabilitation work had already been done. Under the receivership which extended from November, 1920, to March, 1926, ties over the entire system had been replaced. On a stretch of track some 6 miles long, between Franklin and Middletown, old 60-lb. rail was replaced with 85-lb. section. New gravel ballast was put in at points where it was most needed, and nearly all special work on the property was renewed. Approximately $350,000 was spent on rehabilitation work during the receivership, most of it going into track.

During the past year, 2.4 miles of city track on Pleasant Avenue in Hamilton was completely rebuilt. This included the installation of a new concrete base, Dayton mechanical ties and 101-lb. A.E.R.E.A. T-rail with thermit welded joints. Asphalt paving in this street was placed by the city. The entire property was completely rebonded, wherever it was found necessary. Electric switch lamps were installed to increase safety. For this purpose also, special highway crossing warning signs were installed at approaches to the rail line on all primary and secondary highways.

Track work already under way and planned for this summer includes the reconstruction of 4,300 ft. of paved track in the city of Dayton, 3,600 ft. of track south of Miamisburg, 3 miles of freight line from College Hill to Mount Healthy, and the reconstruction of track through Mount Healthy and in Hamilton. Six existing sidings are to be extended, and a block signal system installed from Miamisburg to Moraine.

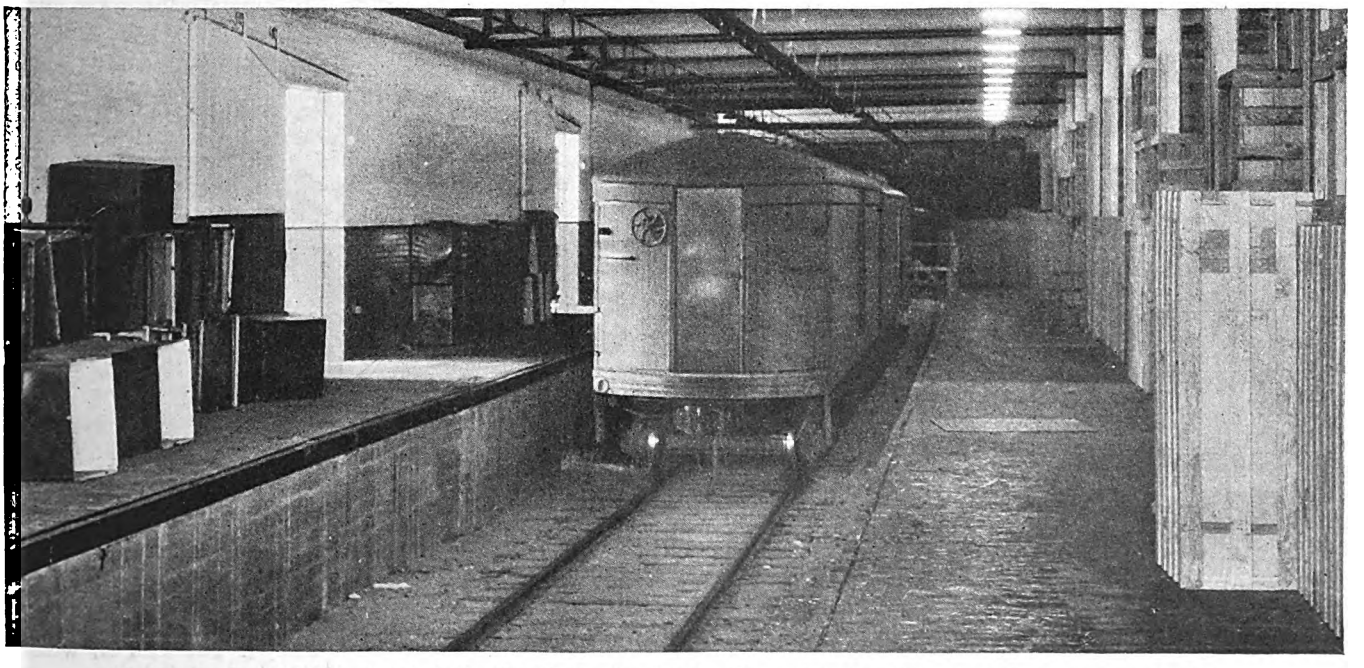


Eight modern full automatic substations provide uniformly distributed power to insure speed and reliability on the C., H. & D. This 1,000-kw. station at O'Neils is one of the two-unit stations at each end of the line

Power Supply Completely Modernized

Substantial economies were made by the abandonment of the company's old 25-cycle Lindenwald generating plant. A contract for the purchase of power was made with the Union Gas & Electric system of Cincinnati, which provides power at 33,000 volts and 60 cycles from three generating plants, two in Cincinnati and one in Hamilton, all connected to that system's high-tension bus in Hamilton and fed over two circuits from the Hamilton station to the C., H. & D. transmission line. Oil switches and disconnects are arranged for sectionalization of the transmission system north and south from Hamilton in the event of line failure. An auxiliary connection is made at Dayton to the Miller's Ford plant of the Dayton Power & Light Company, for use as an auxiliary power source in the event of an emergency.

This purchased power is transmitted at 33,000 volts by the C., H. & D. over its own lines to eight new full



Freight loading facilities inside Delco-Frigidaire plant of the General Motors Company. From three to sixteen carloads of freight per day move out of this plant over the C., H. & D.

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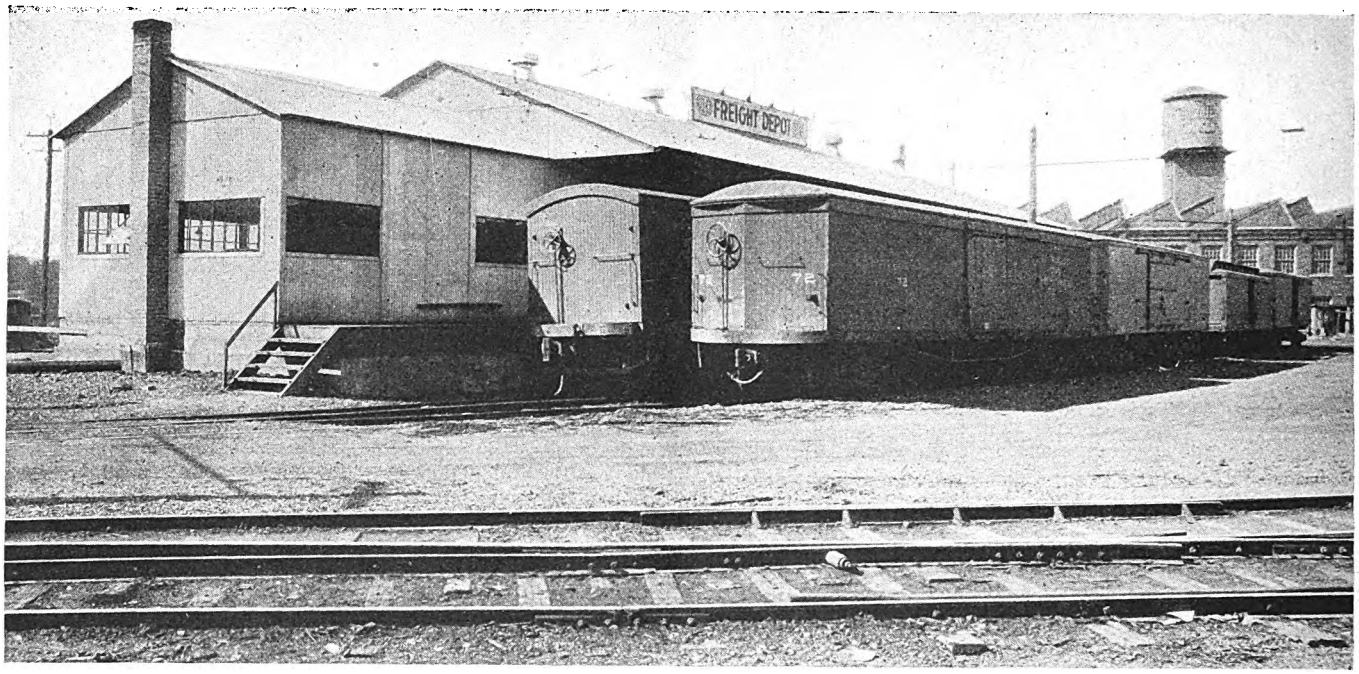
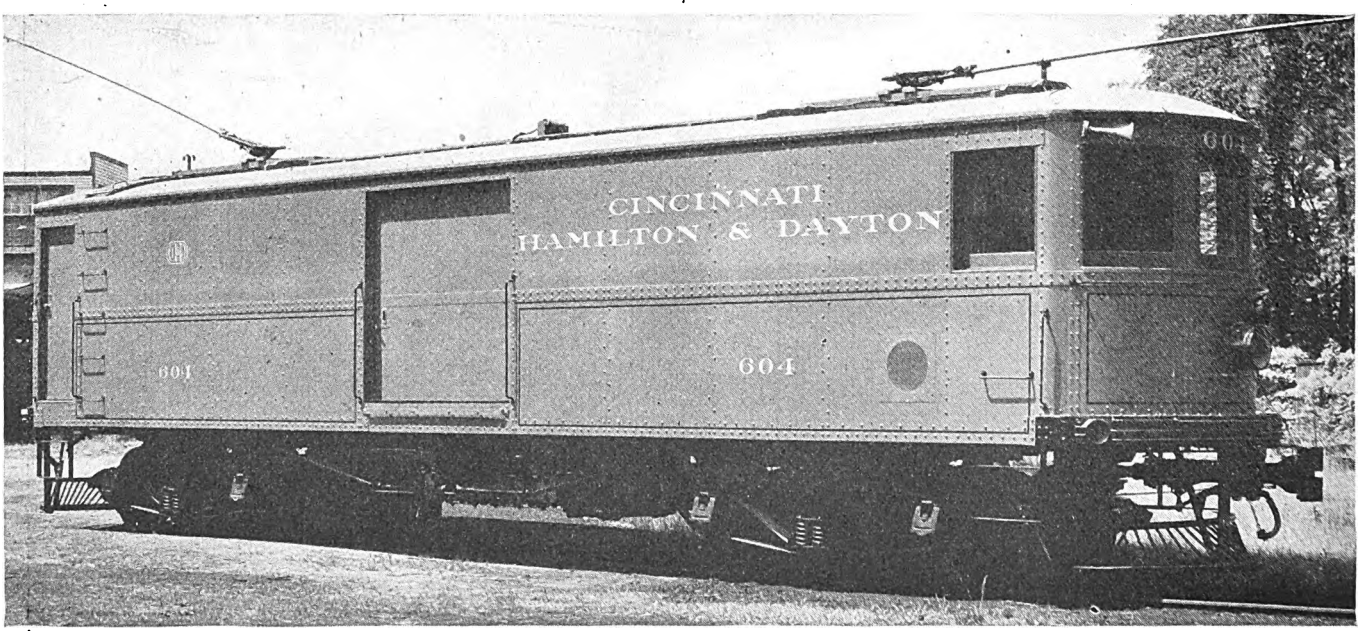


New freight terminal at Cumminsville in outskirts of Cincinnati. These improved facilities make it possible to go after freight business intensively. It has already become necessary to make additions to this terminal

automatic substations that replace six former 25-cycle manually operated stations. Five of the latter have been abandoned. One of them, the College Hill station, was reconstructed for the new automatic equipment. The other seven automatic stations are in new buildings specially constructed for the purpose. The new station locations give better and more uniform spacing and consequently better voltage regulation over the line. At some points on the property, the increase in voltage is 75 per cent over the former condition. The average increase in voltage on the system attributable to the elimination of excessive line drop amounts to 20 per cent.

Starting at Dayton, the substations in order are O'Neils, Miamisburg, Franklin, Elk Creek, Coke Otto, Lindenwald, Pleasant Run and College Hill. O'Neils and College Hill are two unit stations, the former having two 500-kw. machines and the latter two 300-kw. rotaries. All of the other stations are single unit installations. Coke Otto and Lindenwald, on either side of the city of Hamilton, are 500 kw. each. All of the other single-unit stations have 300-kw. machines. Coke Otto and Lindenwald serve the city lines in Hamilton as well as the interurban. By arranging a 500-kw. station on each side of the city, the local lines there may be kept in operation from either station in the event of failure of the other.

All of the substations are full automatic with Westinghouse equipment. Any one of the eight stations may be set, by the operation of a manual switch, to stay on the line and not shut down under light load. The two two-unit stations, O'Neils and College Hill, are located at each end of the line; the former at the north end and the latter at the south end. Being at the ends of the line and feeding in only one direction, two units are used



A new 50-ton motor car built by Kuhlman makes it possible to increase the length of freight trains on the heavy grades north of Cincinnati

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in these stations to give additional protection in the event of failure of one machine. Furthermore, the average load conditions in these sections call for only small rotary capacity during most of the day, with additional capacity in the rush hours or in the event of unusually heavy freight movements. The use of two units permits operation at maximum efficiency under these load conditions.

In the operation of the twin stations, one machine picks up the load and the second comes on only when the capacity of the first is exceeded or when the first machine fails to pick up. Either rotary may be made the leading machine by merely throwing a small manual four-pole switch. All rotaries are plain shunt wound instead of being compound as is customary practice. The shunt winding is claimed by H. W. Bishop, who acted as consulting engineer in connection with the new power installation, to give better load distribution between stations than is obtained with compound-wound machines

Part of the 2.4 miles of new track built on Pleasant Avenue in Hamilton. Construction is concrete base, 101-lb. T-rail, thermit joints and Dayton mechanical ties. Asphalt paving was placed by the city

usually used. Another feature of the power installation is that the transformers in the substations have no automatic switches on their primary side and are left alive continuously.

Modern and Commodious Shop

A modern car shop is necessary to the proper maintenance of rolling stock and to its efficient inspection and repair. In this respect the C., H. & D. will have, when remodeling work now under way is completed, what will probably be the finest interurban shop for a property of this size in the country. Two modern concrete brick and steel buildings of high-grade industrial type of construction, together with some 9 acres of land immediately adjoining the company's right-of-way and the Delco-Frigidaire plant, were purchased from the Smith Gas Engine Company. The larger of these two buildings is 422 ft. long by 111 ft. wide. The second building is 160 ft. long and 101 ft. wide. A full complement of machinery, including wheel presses, milling machines, boring mills, lathes, drill presses, shapers, shears, radial drills, forging and welding equipment and wood-working machinery, is provided, much of which was purchased with the property. Three overhead traveling cranes run the entire length of the larger building, and there are in addition some fifteen jib cranes to serve individual machines. The floors of the shops are laid with wood block set in concrete. The main building will house the truck, paint, electrical, blacksmith, machine and general inspection and overhaul shops. The wood-working shop will be in the smaller building.

A storage yard has been laid out between the two buildings with a capacity for 75 cars. Entrance tracks to the buildings are arranged so that single cars or trains may be run directly into the shop for inspection or repairs. Loop tracks are arranged so that cars may be moved in and out of the yard or shop with a minimum of switching. There is ample natural and artificial illumination to insure efficient working conditions. The main building will house the general offices of the company that at the present time are located in the city of Dayton. It has been found that the saving in rent made will almost pay fixed charges on the entire investment in shop building, land and equipment. The old shop at O'Neils has been sold to the Moraine Development Company at a figure that paid a substantial part of the cost of the new shop. It will be abandoned and razed to make way for a new boulevard entrance into the Moraine development.

Large Suburban Expansion Planned on Northern End of the Property

When completed the Frigidaire plant at Moraine will employ upward of 12,000 men, a substantial proportion of whom will travel morning and evening by the C., H. & D. northward to Dayton and southward as far as Middletown. The interests affiliated with the Frigidaire enterprise some time ago purchased approximately 2,000 acres in the immediate vicinity of the plant. Within the last few months the active development of the property as an industrial town has been inaugurated. Sewers and water and gas mains are being laid, streets are being paved and other developmental work is proceeding rapidly. The C., H. & D. will play an important part in the development of this community, both through the provision of frequent rapid-transit service to and from Dayton and points south in the Miami Valley and through the provision of freight facilities for contractors and home builders and transportation for the residents of the community.

Modern Freight Facilities

Facilities provided for the efficient handling of freight are sufficiently in advance of those found on the average interurban property as to be worthy of some detailed discussion. The ultimate possibilities of freight business on the line are undetermined because to a considerable extent the business is contingent on interline possibilities of the other connecting interurban lines in the central Ohio and Indiana territory. Cincinnati, however, offers a gateway to the South for electric freight from the entire central territory if electric railway facilities are sufficiently developed through the district to handle it properly.

Besides the 40 new standard C.E.R.A. box cars previously mentioned, there is under construction by the Kuhlman Car Company in Cleveland a 50-ton freight motor car having the same capacity and equipment as a

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Westinghouse standard 50-ton electric locomotive. In addition, there are on the property four freight box cars equipped with four 140-hp. motors each, and nine additional box trail cars.

Longer Trains on Hills

The new freight motor unit is of all-steel construction and is equipped with four Westinghouse 562-D-5 motors that are ventilated by motor-driven blowers mounted in the car. The longitudinal sill channels of the car underframe are covered with a plate to form an air duct that is connected in turn by flexible canvas ducts to the individual motors. The blower has capacity to give approximately 800 cu.ft. of air per minute to each motor. Total weight of the unit is 100,000 lb., which is divided 46,500 lb. for the body, 13,000 lb. for each of the Brill 50-E-4 arch-bar trucks without motors, 25,000 lb. electrical equipment, and 2,500 lb. for air-brake and other equipment. It is mounted on 36-in. wheels and has a gear ratio of 17:60. Double end HLF control is provided. The trucks have a wheelbase of 7 ft. 6 in., and the unit is designed to negotiate curves of 35 ft. radius.

This motor car is intended for service on the hills between Cincinnati and Hamilton, where it will make possible the handling of five-car trains of loaded box cars over maximum grades of 5 per cent in place of the present limit of two cars with the old motor equipment formerly available.

Both ends of the steel body are framed for three window sash. The side posts consist of 4-in., 13.8-lb. H-bars, extending from the bottom sill angle to the top plate. An intermediate belt in the body framing consists of a 4-in. x ½-in. plate extending full length of the car and around the ends, and securely riveted to all posts. Doors are of steel frame construction, paneled with steel. At the center of the body on each side there are sliding doors, inside hung, which slide into steel inclosed pockets. At each end of the car, on the left side of the vestibule, is a swing door for use of trainmen. On the interior there are two safety partitions, one located at each end of the car, approximately 6 ft. from the end. These partitions extend from the floor to the ceiling and are constructed of substantial steel framing sheathed on the inside. Each partition has a sliding door with hasp and staple so that the interior of the car may be completely sealed. The inside of the body is sheathed with No. 12 gage steel. On the outside it is covered with $\frac{3}{16}$-in. steel plates.

While it is as yet too early to form any final judgment as to the effect of the new interurban equipment on passenger traffic, the results secured during the first twenty days of July show a gratifying and unmistakable increase in business, according to the management. This increase is upward of 6 per cent over the revenue immediately preceding the introduction of the new equipment. Based on experience on this property and elsewhere, it is felt that the growth of traffic occurs cumulatively for several months following the introduction of new equipment, as the advertising program is taking effect.

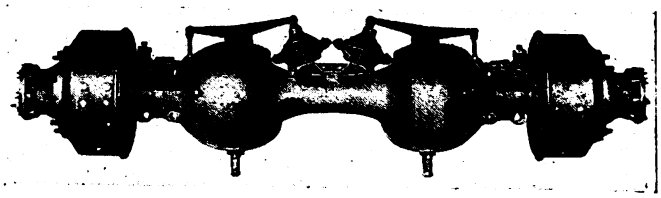
Whereas the steam railroads in the Dayton-Cincinnati territory are showing decreases in freight traffic, the C., H. & D. continues to forge ahead in building up its freight business. The same policies which were used by the same management with success on the Aurora, Elgin & Chicago are meeting with equal success on the C., H. & D. Freight revenues have increased month by month over the corresponding months of last year, as follows: January, 23.2 per cent; February, 27.8 per cent; March, 33 per cent; April, 29.5 per cent; May, 22 per cent.

New Type of Gas-Electric Bus

Public Service Transportation Company has ordered 65 units with an electrical system differing in several respects from that used on previous orders by this large operator

SIXTY-FIVE gas-electric buses of A.C.F. design utilizing Westinghouse electrical equipment are being placed in the service of the Public Service Transportation Company, Newark, N. J. At the time of this writing 30 of the units, chassis and electrical equipment, have been delivered by the American Car & Foundry Motors Company to the Newark shops of the Public Service. The bodies are being built there by the Public Service Railway, and already twelve of the buses have been completed and placed in daily service.

The design of the new bus, which is built to afford



Rear axle housing and brake drums, showing twin drive arrangement and the Westinghouse air brakes

low maintenance, departs materially from any previous gas-electric drives and has several features that have been found desirable in bus operation. Among these are an interlocking device operating an auxiliary field for the generator, a drum controller with magnetic blowouts, a safety switch in the starter circuit and a new type of resistor for electric braking.

The bus equipment includes a Hall-Scott engine, a Westinghouse type 188 generator, two type Y-92-C series motors, a type XD-58 main controller, a foot-operated battery switch, a foot-operated field resistance switch, a motor cutout switch and engine test terminal, a set of generator field resistors and a set of braking resistors. It also has progressive-type springs with extra leaves, a double-worm Timken axle drive, 36x8 dual high-pressure pneumatic tires, Westinghouse air brakes on the rear and Bendix mechanical brakes on the front wheels, Dot system of chassis lubrication, Golden Glow twin-beam headlamps and the Protectoseal safety device for the fuel tanks. The general arrangement of the apparatus is shown in the accompanying illustrations.

Generator Has Special Field Windings for Speed Control

The generator, rated at 240 volts and 120 amp., is located behind the engine and is connected directly to it by a hollow shaft and two flexible couplings. It has an interpole shunt winding, a small amount of series field for compounding and a battery field controlled through the field switch that is operated from the foot throttle. The battery field serves as a teaser, while the series field

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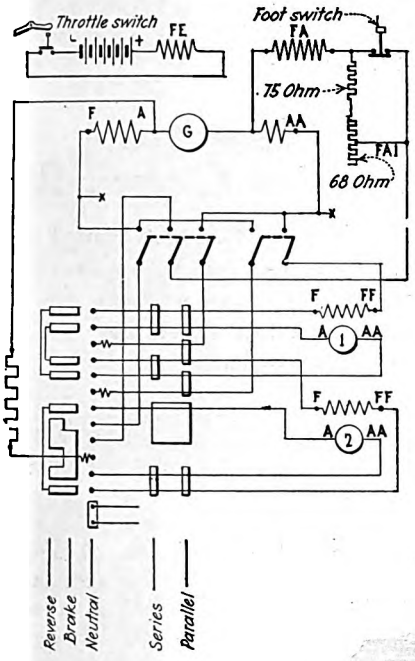
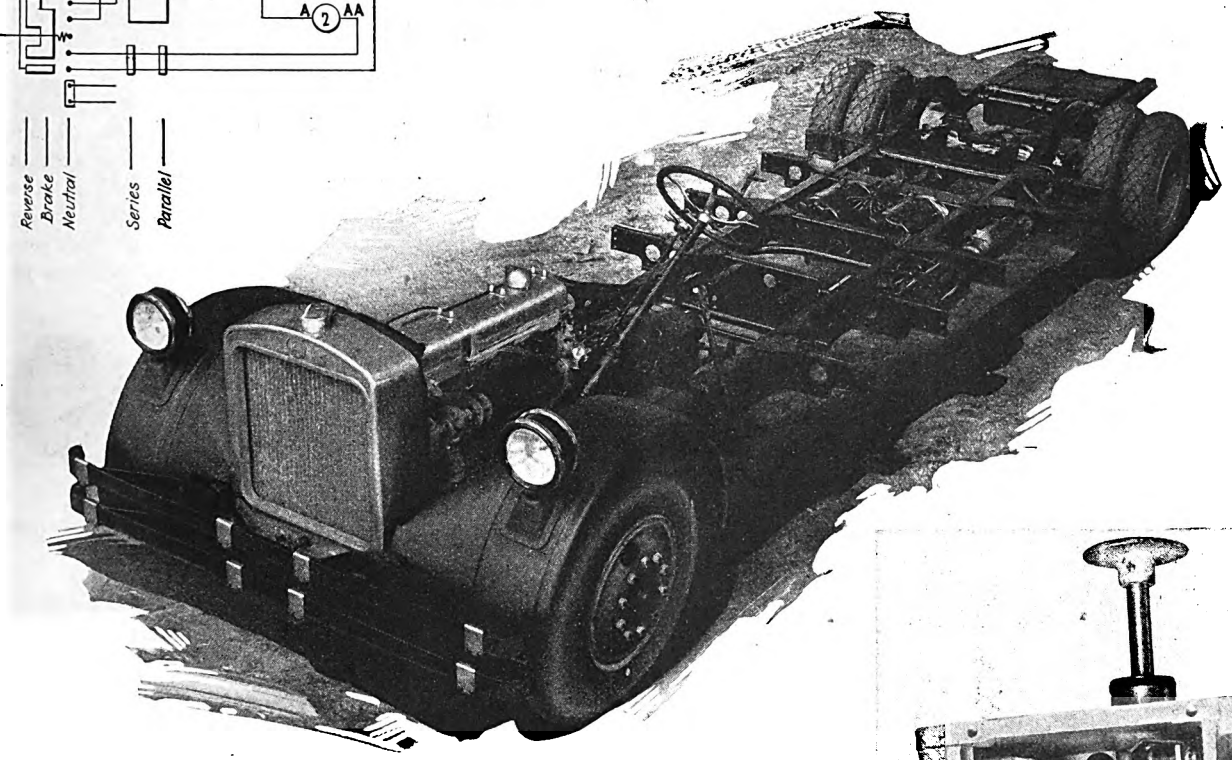


New features in the electrical hook-up include manual field control for increasing acceleration and boosting speed on grades, and interlock, which prevents starting of engine when controller is not in neutral



Gas-electric buses of A.C.F. design and equipped with Westinghouse electrical units are to be operated by the Public Service Transportation Company

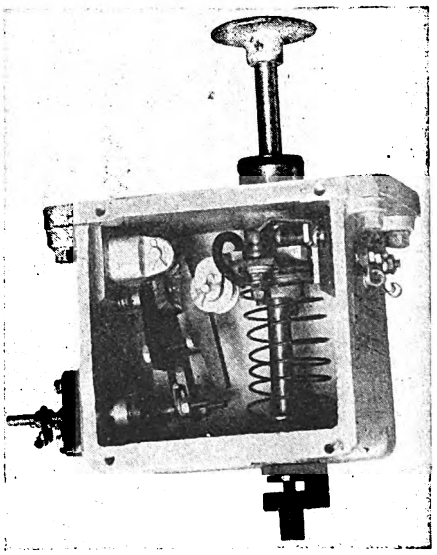
minimizes the amount of battery current required. To provide for additional power output needed for rapid acceleration and on steep grades, a resistance is placed in the shunt field circuit that is controlled by a foot-operated resistance switch. Inserting resistance in the shunt field reduces the excitation and allows the engine to run at a higher speed. The generator is equipped with a unidirectional cast aluminum fan that draws air through openings in the frame and the commutator and expels it at the engine end.

Motors Used Are of the Interpole Type

The two motors, each rated at 240 volts and 78 amp. at 1,800 r.p.m., are of the interpole series type and like the generator have aluminum fans for ventilation. They are controlled by a type XD-58 drum controller, which is provided with magnetic blowouts eliminating dangerous arcing, and having three operating positions in addition to the off and braking positions. There are two forward positions—one for series operation, the other for parallel. The wiring for the engine starting motor is carried through the controller and forms a circuit only when the controller is in the off position. This is a desirable safety feature. The drive from the two motors is through a double-worm Timken axle. The twin drive arrangement is shown in the accompanying illustration.

A new type of resistor is used for electric braking and is mounted midway between the generator and the motors.

Although the bus is designed for service under various conditions of load and grade it is simple to operate. With the bus standing, the engine is started with the controller in its off position and the controller handle then moved to the desired operating position. The bus is then accelerated by depressing the foot throttle. To increase the rate of acceleration, resistance may be cut into the generator shunt field with the foot-operated switch. This is also used when the bus encounters a slight grade. On more severe grades the controller is shifted to the series position. Down-grade control is effected with three kinds of brakes—electric, Westinghouse automotive air type and Bendix mechanical type.



Foot-operated field switch which controls the battery field circuit of the generator

The buses are of the single-deck type and have a seating capacity of 30. The weight of the chassis of each bus is 11,500 lb., the electrical equipment being responsible for 2,400 lb. of this.

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Views in Monza, Italy, on the Lines of the Lombard Electric Traction Company

No. 1. Apartment house built for transportation employees by the Lombard Electric Traction Company near Milan.

No. 2. The Cathedral at Monza was built in the thirteenth century. It is visited by many tourists and contains the famous iron crown of Lombardy.

No. 3. Section of express track on Lombard Electric Traction Company system between Milan and Monza. The span wires are attached to the trees on each side, avoiding the use of poles. Note that the tracks are on a reservation.

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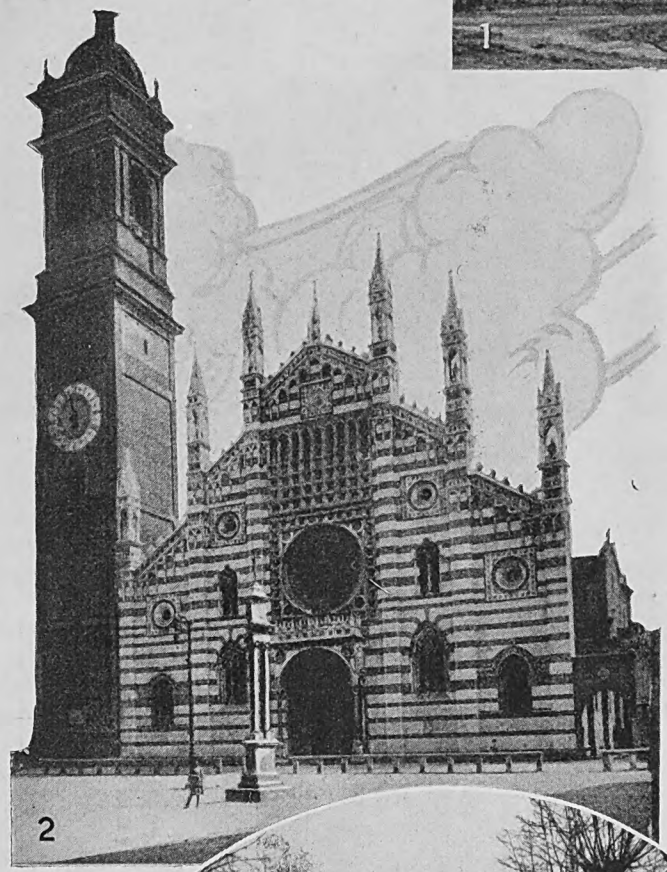
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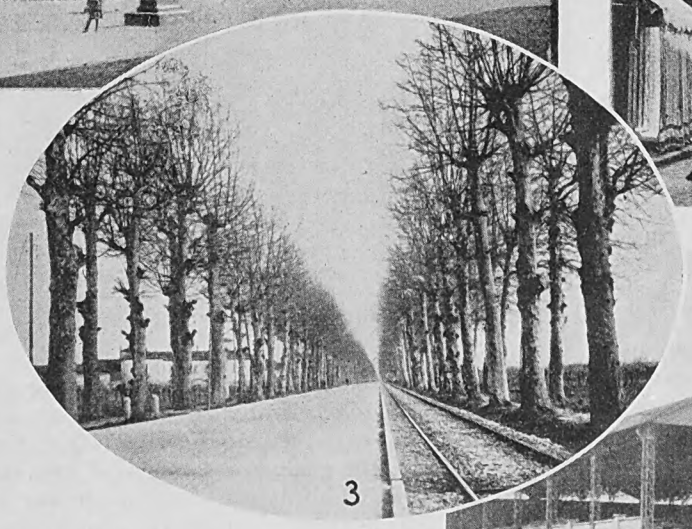
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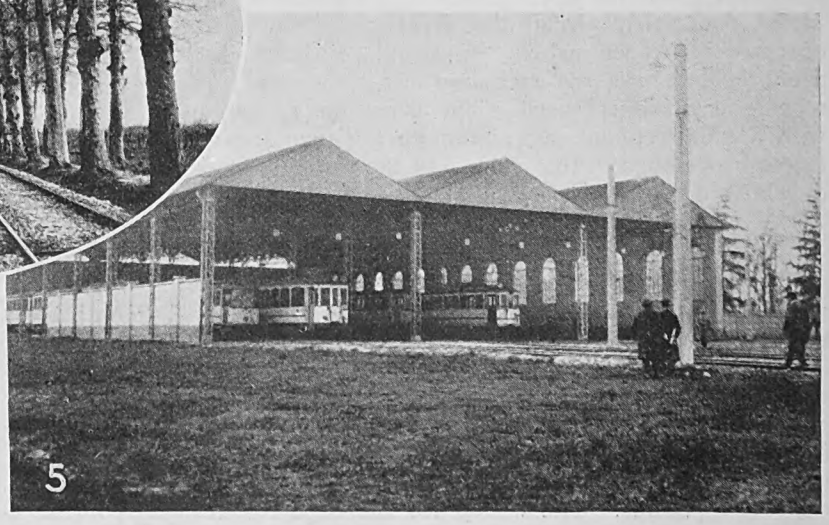
No. 4. A narrow street with track in the old part of Monza. The building in the center of the picture is the ancient Arengario or Communal Palace, built in 1293.

No. 5. Carhouse at Monza of Lombard Electric Traction Company (Milan). The Monza-Milan line is the heaviest traffic section of this railway. Note the absence of doors.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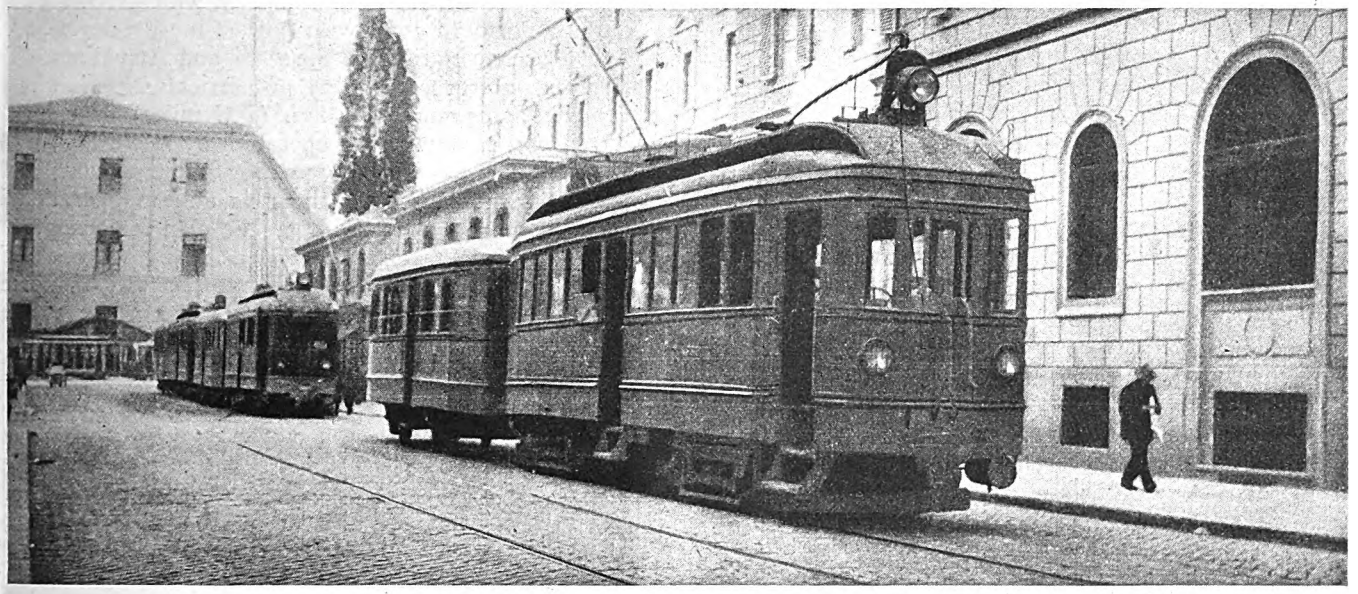
Italy Has Many Interurbans

By Henry W. Blake
Senior Editor *Electric Railway Journal*



Several interurban lines operate out of Rome over the city tracks. These two-car trains operate to Albano

Competition from private automobiles not serious, but buses appear to be taking some business. High-speed electric interurbans increasing. Lombard Electric Traction Company uses all-steel pay-within cars in local service and is erecting houses for men

ITALY has always had a large number of interurban railways built along the highways, and, like those in America, primarily for local service. Originally most of these lines were operated by steam dummies, but many of them, of course, have since been changed to electric operation. The construction of these interurban roads has always been encouraged by the government because of the need which they supply of transportation to rural communities. Statistics published by the Italian Government show that of this class of road there were on Jan. 1, 1925, when the latest figures are available, 4,453,943 km. (or 2,783,714 miles) of such track. Of this mileage about 62 per cent is operated by steam locomotives, 36 per cent by trolley and the remaining 2 per cent by a mixed service. Of the total, 73 per cent has a gage of 4 ft. 8½ in. and 14 per cent a 1 meter gage (39.4 in.). The accompanying Table I gives the distribution of trackage by provinces. The roads included in this summary and table are exclusive of the interurban lines over private right-of-way outside of the State Railway system. Of this class of road there were on Jan. 1, 1925, 4,605 km. (2,879 miles) of track in service in various parts of Italy.

On the whole, these interurban roads, both those on highways and those on private right-of-way, have suffered less from automobile competition since the development of the gasoline motor car than the interurban roads in the United States. The primary reason for this is that the private automobile is looked upon in Italy, as in most countries in Europe, as a luxury which can be afforded only by the most wealthy classes. Whether this condition would be changed if a light, open, inexpensive car locally built was placed on the market it is difficult to say. Nevertheless, the fact remains that one can tour for miles, particularly in southern Italy, and meet very few private cars on the road, and most of these will be closed and usually be of the limousine type.

While the interurban lines have not suffered in their passenger business to any great extent from the use of private cars they must have felt the competition which has come during the last four years from the many bus lines which have been put in service in Italy. The same government publication which gives the statistics of interurban electric lines already quoted also lists the bus lines in operation. These statistics are given in Table II.

Italy, therefore, has much the same situation in regard to the interurban railway versus the interurban bus that exists in the United States. And while the parallel does not hold true in all respects, for the reasons already given, it is most interesting to note that in one respect the experience has been very much the same. This is that the electric roads which have been built to give good service at high speed have felt the competition the least, and provided the territory served is one which can support a high-class electric line they have found that the traffic will respond to that service.

Each of the large cities in Italy is therefore the center of an extensive interurban system. Thus, reaching out from Rome there are a number of interurban lines of

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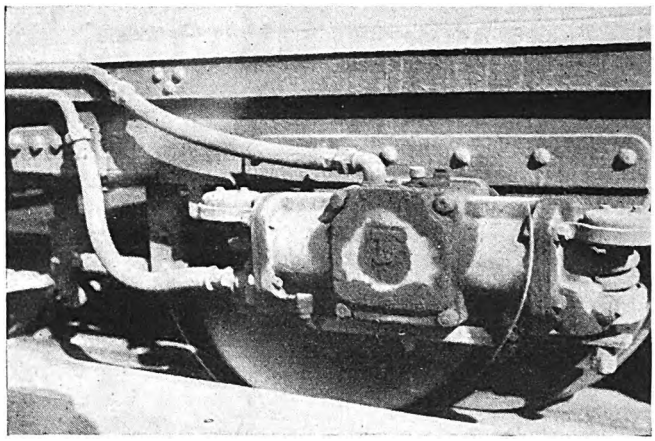


Air compressors are usually driven from the axle, but on narrow-gage roads often have to be put outside the wheel, as shown in this view

which the longest, known as Ferrovia Vicinali, extends southeast as far as Frosione, 70 miles away. This is electric. Another interurban line, electric for the greater part of the way, goes 58 miles to Viterbo. A steam tram line, 18 miles in length, connects Rome with Tivoli. The interurban lines from Naples extend mostly along the shore of the Mediterranean, west and southeast from the city. The longest is that to Salerno, about 35 miles away. From Pompeii to Salerno, or for a greater part of the distance, there are many steep grades and sharp curves through village streets. An interesting feature of the equipment is that, as the line is narrow gage, the axle-driven air compressors for the brakes had to be mounted on an extension, outside the journal box, of one of the axles.

Of all the cities in Italy, however, Milan ranks first as an interurban center. Itself possessing some 750,000 inhabitants, it is surrounded within a 36-mile radius with many prosperous towns and villages, as well as land of great fertility. Most of the territory within this radius is flat, providing ideal conditions for railway building. Of the several interurban railway systems reaching out from Milan, the most imoprtant is that of the Società Trazione Elettrica Lombarda, or Lombard Electric Traction Company. As this is one of the outstanding interurban lines of Italy particulars will be given.

Controlled by the Milan Edison Company

The Lombard Electric Traction Company is controlled by the Società Generale Italiana Edison di Elettricità, or General Italian Edison Company, which serves a large part of northern Italy with power, mostly developed in hydro-electric stations in the Alps and Appenines. The city and interurban railway properties which it directly controls aggregate 1,133 km. (708 miles) of route, of which 43 per cent are in operation by electricity and 23 per cent more will be electrically equipped during the present year. The remainder is still in operation by steam dummies, with no immediate plan for change.

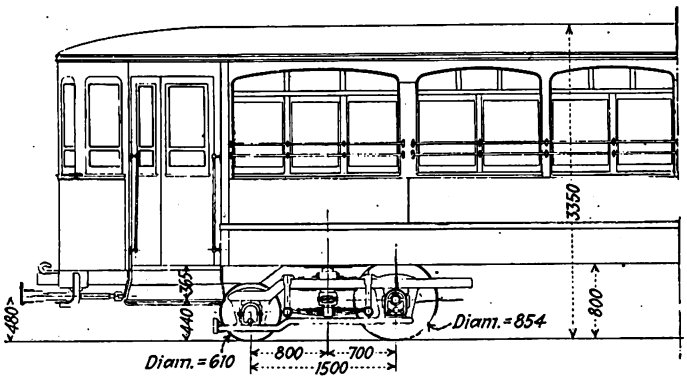
The financial strength of this company assures to the Lombard Electric Traction Company ability to possess equipment adequate to the needs of the public which it serves.

TABLE I—MILES OF INTERURBAN RAILWAY ALONG HIGHWAYS IN ITALY, JAN. 1, 1925

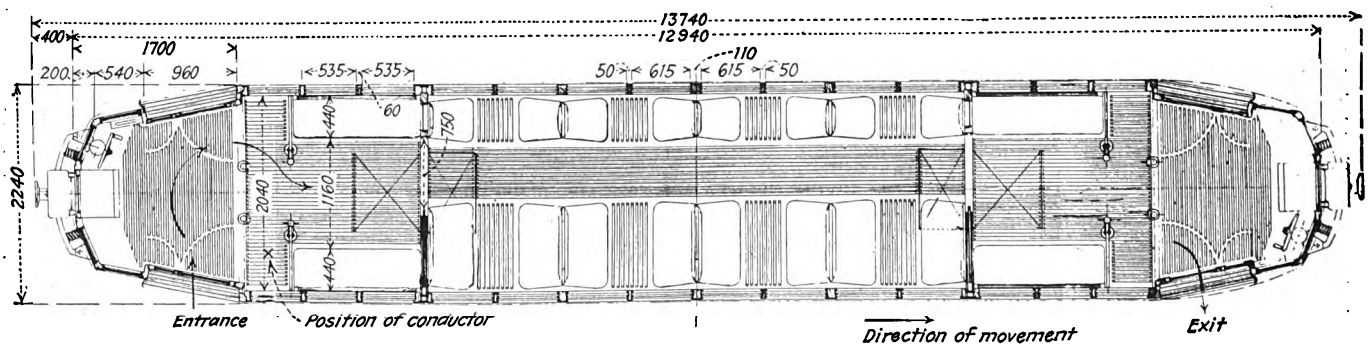
Province	Length of Line, Kilometers	Province	Length of Line, Kilometers
Piedmont	969.045	Umbria	16.963
Liguria	31.349	Lazio	231.926
Lombardia	1,280.458	Campania	133.448
Venezia Tridentina	70.877	Puglie	84.764
Veneto	427.364	Sicilia	89.850
Venezia Giulia	83.039	Sardegna	10.600
Emilia	670.472		
Toscana	336.918	Total	4,453.943
Marche	16.870		

TABLE II—SUMMARY OF INTERURBAN BUS LINES IN ITALY, JAN. 1, 1925

Province	Length of Route, Kilometers	No. of Buses	Province	Length of Route, Kilometers	No. of Buses
Piedmont	2,011	345	Lazio	1,648	173
Liguria	701	124	Abrussi	2,259	171
Lombardia	1,010	135	Campania	1,775	114
Venezia Tridentina	499	40	Puglie	592	45
Veneto	1,090	123	Basilicata	1,370	69
Venezia Giulia	1,154	73	Calabria	1,446	90
Emilia	2,241	214	Sicilia	1,516	123
Toscana	2,532	170	Sardegna	1,806	76
Marche	2,330	231			
Umbria	1,121	84	Total	27,101	2,400



The electrically operated system of the Lombard Electric Traction Company consists of five radial lines leaving various points of Milan toward Monza, Cinisello, Desio, Mombello and Abbiategrasse. On most of these lines both express and local service is given. In limited service the average speed is 50 m.p.h. The revenues from operation during 1926 were 18,934,106.39 lire, corresponding (at 22 lire to the dollar) to $860,641. With a large proportion of the line electrically equipped, it is expected that next year the receipts will be larger. Other statistics for 1926 follow: 2,383,972 motor car-



Pay-within car of Lombard Electric Traction Company, one of the few prepayment cars in Europe (dimensions are in millimeters)

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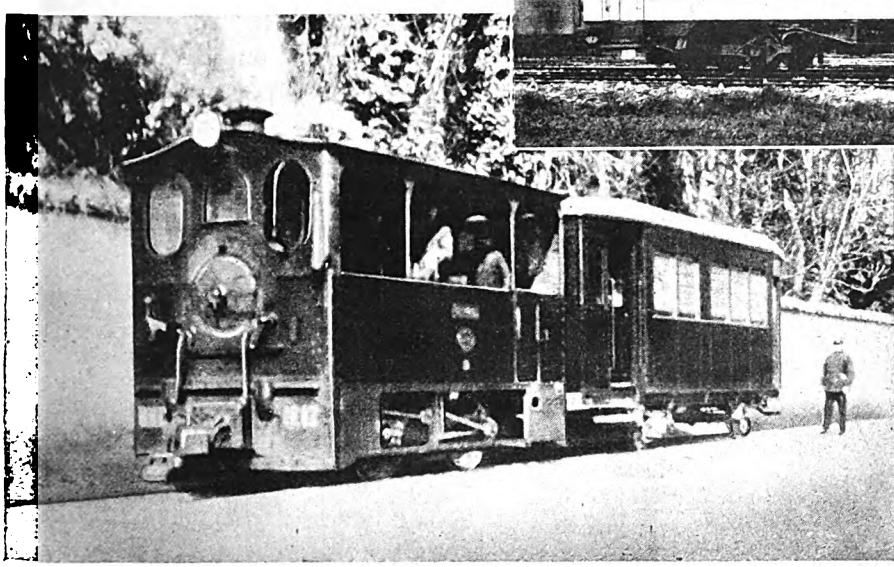
kilometers (equal to 1,489,983 car-miles) were run; 2,793,022 trail car-kilometers (equal to 1,745,639 car-miles) were run; 150,838,472 passenger-kilometers (equal to 94,274,045 passenger-miles) were made.

The heaviest traffic line of the company is that between Milan and Monza. This is double track all the way, and from Sesto San Giovanni to Monza there is a third track for express service, so that for this portion of the line, or about two-thirds of the distance between Milan and Monza, the road is triple track. On this

Even the interurban cars have to be kept narrow, because of the small clearances on the streets on which they operate

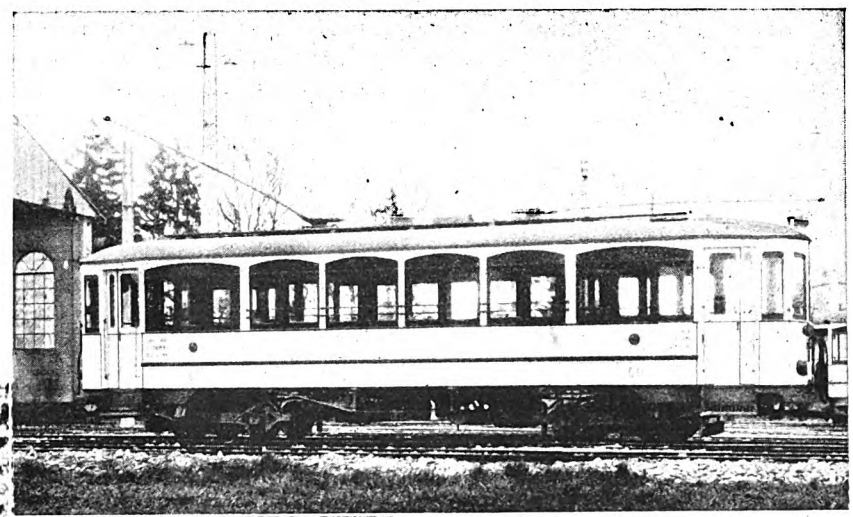


Steam tram of Lombard Electric Traction Company. These will soon be abandoned for electric operation

Milan-Monza section during 1926 the receipts were 566,662 lire per kilometer of route, corresponding to about $16,098 per mile of track. Monza, it might be added, is not only a thriving industrial city of about 40,000 inhabitants but also one of great antiquity. Its cathedral, built in the thirteenth century, contains the famous "iron crown" employed in the coronation of the Holy Roman emperors since 1311, and still used at the coronation of the Kings of Italy, who come to Monza to be crowned in its cathedral. The iron crown derives its name from the fact that it contains an iron band said to have been hammered from one of the nails used at the Crucifixion. There are other buildings and relics of antiquity in Monza, so that the railway enjoys some tourist trade as well as that naturally coming to a line connecting a city of its size with a metropolis like Milan, some 10 miles away.

A characteristic view on the Milan-Monza line is shown in the third illustration on page 186. Four features are especially noticeable in this view. One is the straightness of the road; the second, the absence of grade, characteristic of this part of Lombardy; the third, the separation of the railway right-of-way from the highway by curbing; the fourth, the inconspicuousness of the overhead construction. This is secured by attaching the span wires to the trees rather than to poles. In fact, it is common practice in Europe to use buildings (and in some cases trees) for supporting the span wires rather than poles. The method is one to be commended for economy and appearance.

The Lombard Electric Traction Company is one of



All-steel, snow-white, pay-within car of Lombard Electric Traction Company, one of the few cars in Italy patterned after American rolling stock

the few lines of considerable size in Europe to use pre-payment collection for fares. This is done, however, only in local and slow train service. Tickets are also sold on the trains, at news-stands and at the shops of tobacconists and confectioners at points on the route. There are also commutation tickets and special workmen's weekly tickets, which are sold at reduced rates.

All lines are standard gage (1,440 mm. or 4 ft. 8½ in.) and the rail weighs 28.3 kg. per meter (56.6 lb. per yard). All track on reservation is rock ballasted. The maximum grade is 0.7 per cent. The trolley voltage used is 600, but the car equipments being purchased are insulated to carry 1,200 volts, so that they can run on a 1,200-volt line if necessary.

All Cars Snow White

A feature of all electric cars in and about Milan is that they are painted white. The city cars in Milan are finished an ivory white. The Lombard cars are painted a snow white and present a very handsome appearance on the street. The stripping, including that at the bottom of the side panel, is dark red. The trucks are painted a light gray.

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One of these suburban cars used is illustrated on page 189. It is mounted on maximum traction trucks with motors of 50 to 70 hp., is of all-steel construction, weighs from 17 to 20 metric tons and hauls one or two trailers. Except for its narrowness it looks very much like a car which would be employed in America in similar service. Only one class of fare is collected on the local car. Incidentally, this is one of the very few all-steel cars used in urban or interurban electric railway service in Italy.

For high-speed express service four-motor semi-steel cars with center entrance and designed to haul four trailers are used. Recently a number of cars of this type, each with four 90-hp. motors and capable of hauling six trailers, have been put in operation. Center-entrance motor cars are used for this service because of the necessity felt for providing accommodations for both first and second-class passengers on express trains. The distinctions of first and second class have been abolished generally in Italy on the city tramways, though retained in some countries in Europe. The steam railroads continue, however, to provide accommodations for first, second and third class, so provision for two classes is still made on many interurban properties. The Lombard Electric Traction Company is one of them.

Other Motive Powers

Besides electricity, the company is testing one or two gasoline or gas-electric motor cars. It is thought they may fill a need on lines where the traffic is not sufficiently dense to warrant full electrical equipment. One of the gas-electric cars is illustrated below, but it is purely in experimental service yet.

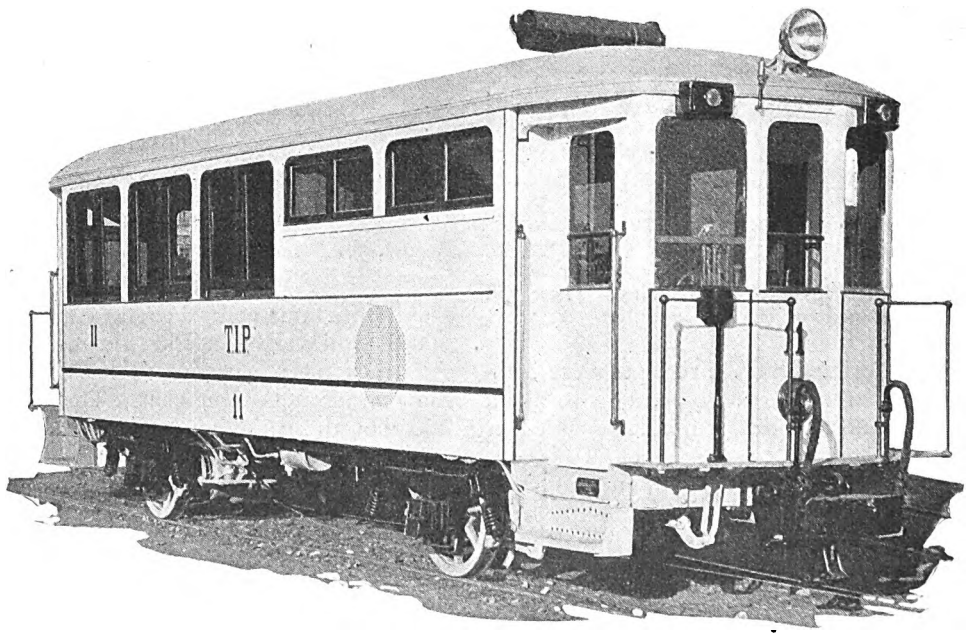
A view on page 189 shows one of the steam locomotives which the company expects to replace. At one time locomotives of this kind were in common use by the steam trains on Italian highways. A few are still left. They are well designed for their kind, but their kind has become obsolete. An interesting feature of operation of those still in use is the legal obligation that a man must clear the way for them when they pass through a village. In consequence, a flagman has to be kept for this duty. When the train approaches the town limits it slows down. Then it follows slowly a flagman who runs ahead of it, blowing a bugle to warn other vehicles that it is coming. To those unacquainted with the narrow streets and sharp corners of the usual Italian village this procedure may appear strange. But where there are no sidewalks and hardly room between building walls for two vehicles to pass and where the streets are very crooked, the rule appears more reasonable. Electric cars are exempt from this regulation, presumably because with their air and electric brakes they can be stopped much more quickly.

Housing Provided for Employees

A feature of the transportation practice of the Lombard Electric Traction Company is one which is followed to some extent on other roads in Europe, namely, that of providing living quarters near the carhouses for a portion of the transportation force. Nearness to their place of work is advantageous to the men in saving their time of transit and to the company because it can more easily reach needed employees in case of emergency. In the case of the Lombard company accommodations are provided by apartment buildings, in which the apartments can be either rented by the employee or purchased by him on the installment plan.

One of these apartments at Monza is illustrated. In case the apartment is purchased by the employee and later he retires from the service he has the option of retaining or reselling it. Each apartment house is built and owned by a separate company organized by the railway company for this purpose.

The turnover of employees on Italian roads is much less than on the average American road, so that cases of employees owning apartments leaving the service are not common. No compulsion is exercised on the men to rent or purchase an apartment in these buildings, but the rent and sale prices are made so low that they are in demand by men with families who have no compelling personal reasons for living elsewhere.



This gas-electric motor car is in experimental use on lines of the Lombard Electric Traction Company, Milan

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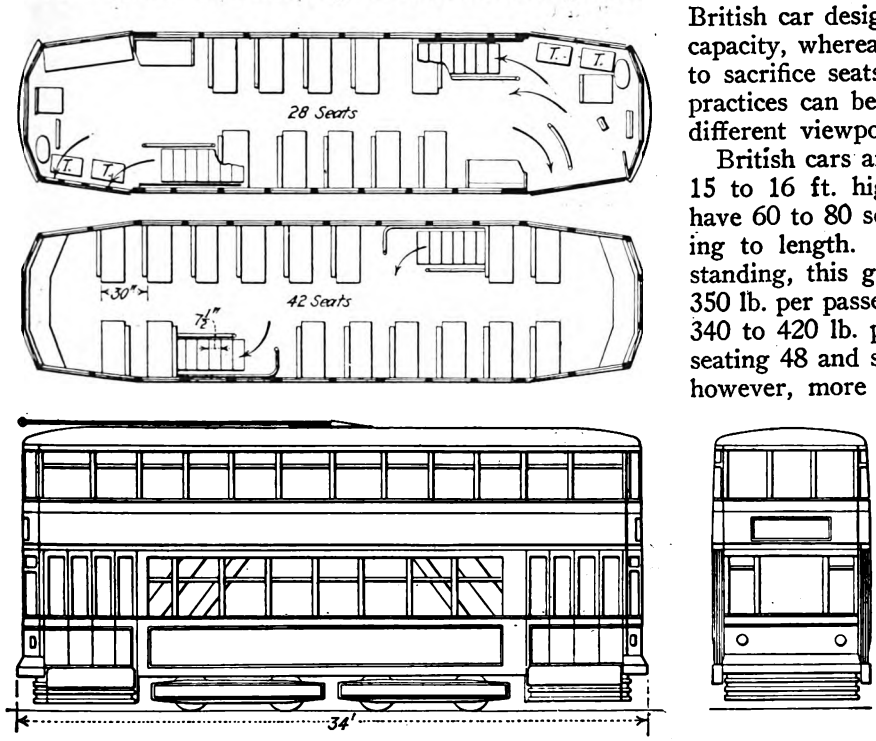
Double-Deck Car Deserves Consideration

By Henry Watson
Tramway Engineer, Wallington, Surrey, England

Principle which has been extremely successful in Great Britain might prove advantageous in certain large American cities

USE of double-deck buses in certain American cities may stimulate interest in the possibilities of double-deck street cars for handling traffic there. At present the use of the double-deck car is confined almost entirely to Great Britain and one or two South African cities. Neither in America nor in continental Europe has it found favor. In most large British cities single-deck cars are practically non-existent. Other countries have tried the double-decker and abandoned it. Most cities in Great Britain have operated single-deck cars and likewise have discarded them.



Double-deck car proposed to meet traffic conditions in America, designed for either one-man or two-man operation and seating 70 passengers

Advantages of the double-deck car are more noticeable in Great Britain, where narrow streets have restricted car lengths and widths, where economy is more desirable and where the public has been accustomed to a higher ratio of seats to passengers in rush hours, than in America. Perhaps these conditions have not created the double-decker, but on the contrary the car has permitted these conditions. In any case, it is interesting to observe that while American systems usually have a higher standard of comfort, on account of a larger proportion of double-truck cars, upholstered and cross seats, greater leg-room and aisle space, passengers enjoy much better conditions in rush hours in Great Britain, where the ratio of seats to passengers is higher at that time. British car designers have aimed for the highest seating capacity, whereas American operators have been willing to sacrifice seats for doorways and wider aisles. Both practices can be carried to extremes and both illustrate different viewpoints.

British cars are, roughly, 28 to 34 ft. long, 7 ft. wide, 15 to 16 ft. high, 24,000 to 35,000 lb. in weight and have 60 to 80 seats and single or double trucks, according to length. Allowing fifteen to twenty passengers standing, this gives 400 to 440 lb. per seat, or 320 to 350 lb. per passenger, against 630 to 800 lb. per seat and 340 to 420 lb. per passenger for a 45-ft. American car seating 48 and standing 40 passengers. Seat spacing is, however, more generous on the American car. Thus old British cars compare favorably with modern American cars, even under rush-hour conditions.

The opinion seems to be prevalent in America that double-deck cars are inherently slower in passenger interchange and, therefore, cannot make the average speed of single-deck cars. The writer has devoted considerable time to observing the loading of double-deck cars and buses in heavy traffic in Great Britain and can find no theoretical or practical evidence to support this theory. It may be true of cars of gigantic proportions, such as have been tried in New York, but the double-deck feature should be considered, not with a view to larger cars, but to shorter and lighter ones of equivalent capacity.

British practice favors two end platforms with a rear, double-width, combined entrance and exit, and a winding stair on the platform making a half or quarter turn to the upper deck. Superficial observers have criticised this arrangement as not providing a separate exit, but it has met requirements fairly well, for a double stream may enter or leave the car, one from each deck, and stops for boarding only or alighting only seem to predominate, at

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least in British cities. Because of the double stream loading and unloading, this car can handle traffic very effectively. As stops for both boarding and alighting passengers appear to be in the minority, the writer believes that this combined entrance and exit is preferable to separate entrances and exits where they are only of single width. A few systems operate cars with a single exit doorway off the front platform, underneath or in front of the stair, cars always being double-ended. Probably increasing pressure of competition and traffic congestion will render desirable the more general use of a front exit. For American pay-enter cars a separate exit and larger platforms would be essential.

The Car Is Not Slow

At most stops the stair is negotiated while the car is moving, and it is difficult to understand why the double-decker is regarded as a slow car. The writer believes this opinion to be a fallacy supported by operators with no extensive experience with such cars, and to be proved so by the average speeds of British systems, particularly of the L.C.C. system, whose cars average 9.6 m.p.h.

At first sight this does not appear to prove much, particularly as this system does not operate into the heart of London and does not encounter heavy automobile traffic. On the other hand, it operates in very congested suburbs, considerably impeded by horse traffic and motor buses, both much more obstructive than autos, on streets seldom more than four traffic lanes wide, with little outer suburban and no rural mileage, without safety zones, with stops spaced 240 yd. apart and cars carrying nearly 100 passengers in rush hours. In spite of these conditions, it puts up an average equal to some American systems and superior to most, if not all, European city systems, whether operating single or double-deckers. The lower averages shown by other British systems as compared with American ones are due to limited semi-rural mileage, narrow streets, higher car loadings, inadequate motors, single trucks, hand brakes, etc. When these considerations are remembered, there is no evidence left to condemn the double-deck car, particularly as their averages are often better and continental averages. The Johannesburg Tramways makes 10.5 m.p.h. with double-deckers.

Mounted on two trucks, the double-decker can provide quite satisfactory riding, and the writer has never found public criticism of the riding of this type of car. Unfortunately, many British systems still operate numerous cars on single trucks of obsolete design, giving uncomfortable riding at high speeds. Much traffic has been lost to competitive buses for this reason. Some systems, intent on standardization, have even operated these cars on interurban routes, for which the double-deck car is unsuited. The absurdity of this practice has been recognized in the construction of a few single-deckers for interurban routes.

Experience has shown that the double-deck car is quite safe, overturnings on curves or through wind pressure being extremely rare. Similarly, the stair has not been found to introduce any appreciable element of danger.

The top-covered car is favored mostly by British operators, the open-top deck being found largely on smaller systems enjoying mild weather. Total inclosure of the upper deck is more popular, though cars with the ends of the top deck left open are still favored in some cities. In any case, in British practice, the upper deck provides facilities for enjoying fresh air, a wider view and smoking.

The special construction adopted by American bus builders to obtain a low top with full headroom has not been adopted in Great Britain, as it has been usual to lower the roadway under such bridges as would otherwise prevent the operation of the normal top-covered car. Such a procedure would, doubtless, be preferable where a considerable traffic were to be carried by double-deck cars. Headroom of a little over 6 ft. should not prevent satisfactory ventilation under American climatic conditions and rather adds to the coziness of the car, as is apparent in bus interiors.

The car design illustrated herewith is proposed for handling heavy city traffic and provides 70 seats in an over-all length of 34 ft., while at the same time having fairly generous dimensions in respect to seat spacing, doorways, platforms, stairs, etc. It may be operated by one man or two men, much in the same way as existing end-platform single-deck cars, at least with slight alterations. In the case of two-man operation, it might be practicable to place the conductor between a double stream of boarding passengers, who would circulate through the car in two streams, one on each deck. Such a method of operation would, perhaps, hasten passenger interchange very considerably.

The short wheelbase shown is standard British practice and does not cause appreciable pitching or nosing in service. Some cars occasionally lurch fore and aft, but this seldom assumes importance and is not inherent.

In estimating the weight of this car, it is interesting to note that some cars recently constructed by the London Tramways on the steel-reinforced wood principle with dimensions 36 ft. x 7 ft. x 15 ft. weigh 27,000 lb. approximately, with two 50-hp. motors and having some 70 seats. The car proposed might therefore weigh 28,000 lb., or 400 lb. per seat, against 600 to 800 lb. per seat in modern American cars.

Taking a 48-seat, 43-ft., 32,000-lb. single-deck car as typical, and assuming the standing load in rush hours to be 100 per cent of the seating capacity; i.e., 48, the proposed double-decker could easily carry 36 standing passengers on the same basis, being 9 ft. shorter. The 32,000-lb. car would then carry 96 with 50 per cent standing and the 28,000-lb. double-deck car would carry 106 with 34 per cent standing. The advantages of the double-deck construction are, therefore, so marked as to be beyond dispute in so far as weight and capacity are concerned.

The double-deck principle, having such great advantages, in comfortable rush-hour traveling and economy of operation and street space, proved by many years experience in Great Britain to have no inherent limitations in practice in respect to speed, comfort and safety, adopted with considerable advantage by bus builders in several countries, may warrant serious study by American car operators.

Kansas City Railway Subscribes $10,000

A subscription of $10,000 from the Kansas City Public Service Company, Kansas City, Mo., put the recent campaign of the Kansas City Chamber of Commerce for a fund of $450,000 a year for five years for industrial expansion "over the top."

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Sixteen Ways to Use Buses

By Carl W. Stocks
Editor *Bus Transportation*

The author points out that the bus not only can be of value to the electric railway in many ways, but shows sixteen methods in which buses now are amplifying the rail service, making the investment more stable and more profitable

WHEN the Canadian Electric Railway Association met in Winnipeg last June Mr. Stocks was asked to address the members on the possibilities of buses as an aid to electric railway service in Canada. The present article is revised and condensed somewhat from the original address. It contains much of interest to the American street railway operator.

YOU have all heard that old saying, "A place for everything and everything in its place." It is usually employed to denote a house in order. Applied to the transportation household this means, to the motor carrier, the right type of bus in the right place at the right time; to the electric railway and steam railroad managements, rail transportation in territories when and where traffic demands and buses to serve where rail service is not economically justified.

To the public it means appropriate and efficient transportation at a cost consistent with the class of service furnished, and with each agency serving in the place where it can serve best. And the signs of the times indicate that a rearrangement is quickly going on in the transportation household to approximate this order.

The motor carrier has learned that service economies and improvements resulting from the use of the most efficient size and type of equipment cannot be ignored. Careful calculations of traffic by routes and trips are now dictating schedules and size and type of buses. Constant watch is being kept to see that the maximum number of people are being served by having buses at the right place at the right time. The electric railway and steam railroad managements are doing exactly the same thing, except that they have two sets of tools with which to work; i.e., vehicles that run on rails and those that run on the highway.

As the economics of transportation become better understood and more widely adopted, it is reasonable to believe that many of the arguments now existing between advocates of rail transportation on the one hand and the motor bus on the other, and which have heretofore prevented this orderly arrangement, will disappear. The sheer weight of the argument appears to hinge on the opportunity for profit and the outlook for a continuance of that condition during the life of the investment. In the last analysis this is largely based on the ability of the carrier to earn a return sufficient to attract outside capital for investment.

Today we find four major means of transport, each often largely competitive with the others if territorial coverage alone is considered. But I do not believe that is the true measure of competition, for the reason that each agency can be made to serve where the other will fail from mere lack of ability to earn enough to meet fixed charges.

When I speak of four major means of transportation, I refer to:

1. Steam railroads.
2. Privately owned automobiles.
3. Electric railways.
4. Motor buses.

The order named, I believe, represents fairly well the magnitude of the investment in each. If we stop for a moment and think of their growth and development as public carriers, we find a marked similarity between the steam railroads, the electric railways and the motor buses. Their early history indicates how American genius has always contrived to seek and to improvise a quicker and easier way to accomplish the same results. In other words, the history of the steam railroads was largely repeated in the interurban trolley field, and the motor bus is following along much the same path. Existing steam railroad systems are the outgrowth of attempts to better serve the people—consolidations have been carried out, first with an attempt to operate through schedules and then later to weld one system with another to form a more comprehensive unit.

In the trolley car field, what large city system can be pointed to that is not of the same making? There's Winnipeg, Toronto, Montreal, New York, Boston, Brooklyn, Cleveland and Chicago, to mention just a few.

Now the motor bus industry is repeating that very development. Starting with individually owned vehicles, then adding one or two at a time as payments were possible, later incorporating or forming partnerships as the investment increased, these single lines have grown through mergers or sale into multi-line systems. I think of one system in northern New York that today is the outgrowth of more than 25 single-line routes covering nearly 800 miles of highway and doing close to a million dollars worth of business annually. Many other examples could be cited. During 1926 we recorded in the columns of *Bus Transportation* 116 sales of operating companies. The best part of this trend is that, in most instances, better transportation talent is replacing haphazard management, and there is a marked improvement in operation, in maintenance, and personnel.

Transportation Often Over-Exploited

In some quarters it is said that the bus has been over-exploited. But other transportation mediums also have

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been. So that is nothing new. In this connection I want to say that I believe it is unfair to declare today, as many are doing, that trolley lines constructed 20 or 25 years ago should never have been built. In isolated instances this is so, but I am an old street railway man myself and have had some opportunity to observe the early development of the industry. I say that generally trolley lines were built in good faith to serve the public, but that economic development in later years has so changed the aspect of the transportation field that some of the trolley lines built years ago into then growing territories or hoped-for developments have simply lost out. Dwindling traffic due to changed conditions, brought about by the private automobile traffic and the subsequent growth in improved highways, has forced operating economies to such an extent that the class of service given is not the type demanded by the public today.

This brings up the interesting question, what does the public demand in the way of transportation? Transportation today is as much a competitive industry as is any other business. Time is the only product for sale. In the past it was a ride, and only until recently, with the advance of the privately owned automobile, has this idea begun to be recognized by the transportation companies. Why is it that people are willing to pay excess fares to ride on the fast trains? First, it is merely the question of being able to have more time for gainful occupation and, second, the railroads, with an idea of competitive salesmanship, attempt to hide this motive through advertisements of a higher quality of personal service, comfort, and conveniences.

And even then, where the service does not meet the convenience of the riding public we find them using their own automobiles, not over short distances of 25 or 30 miles, but over distances ranging upward of a thousand miles. In local transportation the same philosophy of time applies, plus the convenience of instant service. No public carrier can, of course, meet such a demand absolutely, but the bus, with its lower investment and greater flexibility, when operated at a fare consistent with the cost of the service, can approximate it.

How is the bus being used to meet this demand? What is the transportation world doing with this new agency?

As a transportation agency, the duty of the electric railway should be to lead in the use of the bus. This it has not done. However, a change is taking place. Today the electric railways of Canada are taking a leading place in the operation of buses. According to the best statistics obtainable, 257 buses were being operated in the Dominion by electric railway companies. This is well over 12 per cent of the 2,000 common carrier and private carriers, including school and hotel buses, which are in operation in the Dominion.

These 257 buses are operated by fourteen electric railway companies. Their routes cover a total of 400 miles. Such figures are impressive of the part played by the bus in your scheme of passenger transportation.

During 1926 three of the companies first used buses; 1925 saw institution of bus service by the same number of electric railways; likewise, three instances of bus were started in 1924; one operation started in 1923, another in 1921, while to our host, the Winnipeg Electric Railway, goes the honor of seeing the value of buses as long ago as 1918 and installing its first motor vehicles in that year.

Of course, Canada as a whole is confronted by a problem which is far more severe than in the United States. I refer to snow and low temperatures, not to say mud. In discussing this, let me say that this is not an unsolvable problem. It is my belief that snow presents less of a problem to the operators of buses than to the operators of trolleys, because the public has a large interest in the clearing of streets and roads since the advent of the private automobile. By enlisting public interest, a great part of the job will be done at public expense. Only improved roads can solve the mud problem of Canada.

However, public interest is not always easy to enlist and, whether for trolley or buses, snow still remains an obstacle to operation which is present in much smaller volume in the United States.

Yet, according to *Bus Transportation's* latest figures on bus operation in the United States, the trolley companies there operate something less than 10 per cent of all buses. One company alone has more than a thousand. You can feel that Canada is well abreast of the progress toward a system of transportation in which each instrument, whether it be the steam train, electric car, or gasoline-propelled motor vehicle, will be used in its proper place so that the system will function at its highest efficiency in every part.

Many Ways to Use Buses

Now, where are we going in the future? How are the electric railway companies going to operate buses? Out of curiosity I have been making an analysis of the ways buses are used by electric railways in city service and in intercity service, and by some railroads. I have not classified these according to the major uses, and the order is just as I happened to put them down.

Bus Use in City Service

1. *Extension feeders to unserved railway territory.* These lines usually are not profitable, because the traffic is too thin for any public transportation service to make money, especially when the rates of fare are part of the fare system of the local trolley line. Many railways are using buses in this manner.

2. *Separate routes from the center of a city or community.* When operated independently of the railway system at commensurate fare with service to meet traffic demands, this usually is a profitable venture. Examples of this will be found in Tampa and Miami, Fla., and Richmond, Va.

3. *Crosstown or belt-line service connecting with the trolley or rapid transit lines.* With short hauls a 5-cent fare can be charged, or a 2-cent or 3-cent transfer sold to give a 10-cent combination fare. Traffic is generally high in rush hours, demanding a considerable amount of extra service, so it is not likely to be profitable.

4. *Buses for local service with trolleys for express.* In this instance the trolleys carry through passengers, operating express between an in-town terminal and the end of the bus line, carrying the local passengers beyond. Providence is an example of this form of service.

5. *Buses for express service with trolleys for local.* In this instance the conditions are reversed. The trolleys give the local service while the buses operate express to outer limits or suburban points, so as to cut under the running time of the trolley cars. An example of this is found in Newark, N. J.

6. *Rush-hour factory service.* Rush-hour service may be given by buses to factories or other centers of activity, to provide short cuts or cross-city hauling so as not to have the lines go through the heart of the city. Examples of this are found in Akron and in Boston.

7. *Supplanting trolley lines for lower cost.* Where the paving cost of trolley lines or track reconstruction is too high to warrant the expenditure with the volume of traffic to be handled, or where vehicular interference so slows up the cars that buses can be better used to handle the traffic, they may be substituted. In some instances buses can keep up with the speed of other traffic better. Examples may be cited in Boston and Troy and Albany, N. Y.

8. *De luxe service.* The next instance of bus use is to establish an entirely different class of transportation service, intermediate between the street car and the taxicab or private automobile. A seat is given for each passenger at a fare above that charged on the trolleys, generally close to 5 cents a mile. Examples can

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be cited in Washington, D. C.; Kansas City, Boston and Toronto.

9. *Community sightseeing trips.* Sightseeing trips have become established in many cities, and little need be said about this class of operation.

10. *Special school service.* Special school service may be provided on regular routes to meet student traffic. Boston and Toronto may be cited.

11. *Chartered or special bus trips.* These correspond closely to chartered car service, except that there is greater flexibilty.

12. *Expansion into new fields.* Buses may be used to carry the service of the company into territory never before reached, or into classes of service never before attempted. The Niagara Falls operation of the T.T.C. may be cited.

13. *Contract service.* Contract service may be given for real estate firms or industrial firms for their employees and others. Such service may be given on a guarantee basis. For instance, in Richmond, Va., the railway has a contract to operate a line for the benefit of employees of a steam railroad and I think in Baltimore a contract was made with a real estate company.

14. *Owl service.* Buses may be used during the night hours so that the entire railway system, or a portion of it, may be shut down. An example of this is the operation of the Washington Railway & Electric Company.

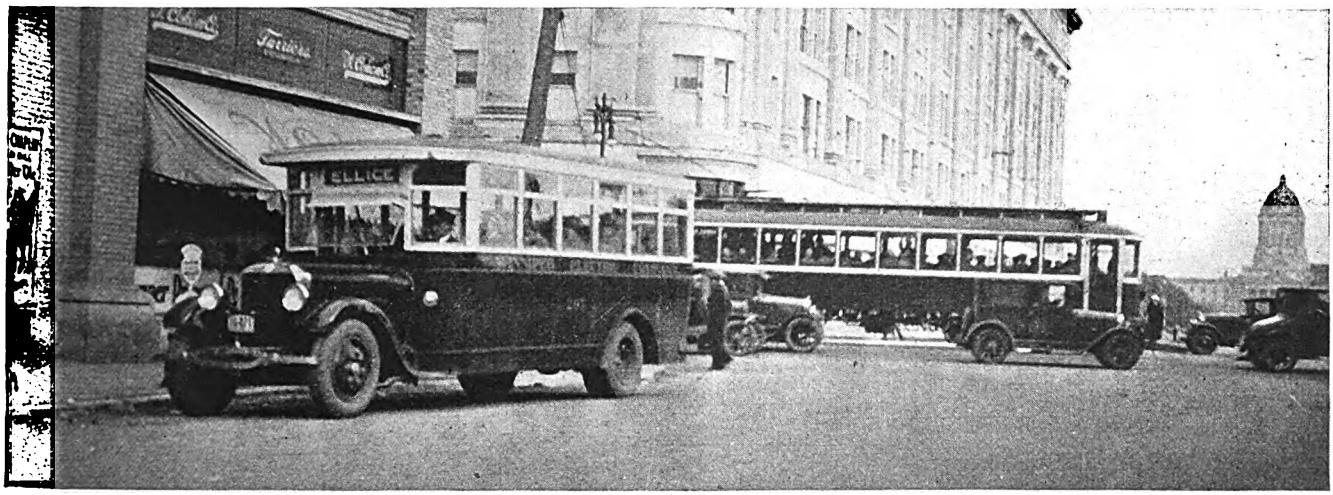
15. *Track reconstruction.* During track construction or reconstruction buses may be used to advantage to give temporary service. Examples of where this has been done are Wausau, Wis., and Brooklyn, N. Y.

operating companies must be organized to function on that basis. Railways, buses, taxicabs—each one of these should be organized under a separate department. Each should have a superintendent who understands he must show a profit in this competitive business.

When two services connect it is reasonable that the joint fares established can meet the cost of service. With the bus the pioneer, and the investment of much smaller magnitude, more requests for extensions are likely to be received. If the railways start all the routes requested the chances of profit are much reduced; it may be said to almost nothing. Hence each new route should be made to carry itself, and operating companies must learn not to fritter away the revenue from good trips by operating at times of the day when no one wants to ride. Three or four profitable trips at a reasonable rate of fare are worth more to the community and the carrier than a lot of non-profitable trips that run down the equipment and provide no money to fix it up.

Think also of the possibilities of interline agreements with other motor carriers in which you might hold an interest but not control. Recognize also that there are some classes of bus routes you never can hope to operate, and extend to the owner or operator your transportation assistance in working out the problems involved, such as terminal facilities, purchase of fuel and oil, tires, painting and overhauling.

The development of bus operation is in your hands, and if you are wide awake and appreciative of the opportunity then you can control in your territory. Otherwise watch out, for you have left the door open for another company to enter.



Buses are used in several ways to amplify the rail service of the Winnipeg Electric Company

16. *Special uses.* In special instances buses may be used for particular purposes in connection with laboratory work. One instance that comes to mind is in connection with a series of tests being made by the Bureau of Standards in Washington. Electric disturbances affected the measurements while some experiments were being made late at night or early in the morning, so the railway stopped its cars and used buses instead until the experiments were completed.

Interurban electric railways can use buses in ways quite similar to those cited. I will not go into them in detail, but they include expansion of the system, duplication of the trolley service so as to give a faster schedule over a different route, to parallel the trolley line to give a different class of service at a higher rate of fare or the reverse, to supplant an interurban line where traffic has dwindled below that needed to meet fixed charges in order to keep franchise rights, for all-expense-paid tours, for long-haul chartered service, and for the carriage of mail and express.

Steam railroads likewise can find many uses for the motor bus. I will not attempt to give them here, although they differ somewhat from the uses I have cited already. Their object in general is to speed up the rail service, using the buses to take care of the overflow of local service.

Because transportation today is a competitive business,

Railway Co-operates with Michigan Highway Department

FOURTEEN cars of resurfacing gravel were unloaded and placed on the roads in Saginaw County on May 20 by the maintenance crew of the Michigan Highway Department. This was accomplished with a truck crane having a ¼-yd. bucket. The material was hauled by five trucks working ten hours and an additional truck working five hours. This record performance was achieved through the service given by the Michigan Electric Railway in looking after and placing its cars promptly.

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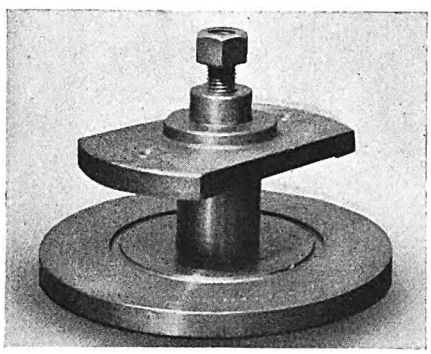
Maintenance Methods and Devices

Drilling Twelve Disks at One Operation

CENTER plates used on the rapid transit cars of the Brooklyn-Manhattan Transit Corporation have a brass wearing plate at the top and bottom. These are held in position by pins which fit into holes in the plates. In order that these may be interchangeable, it is necessary that the holes in the plates be located accurately.

To provide for drilling a number of these plates at one operation, the jig as shown in the accompanying illustration has been devised. This consists of a circular baseplate and an upright circular stud. Twelve plates are placed in this at once and are then clamped securely by the top portion, which is held down by a nut. The top plate has bushings for guiding the drill so as to locate the holes accurately.



Fixture used for drilling a number of plates at one operation

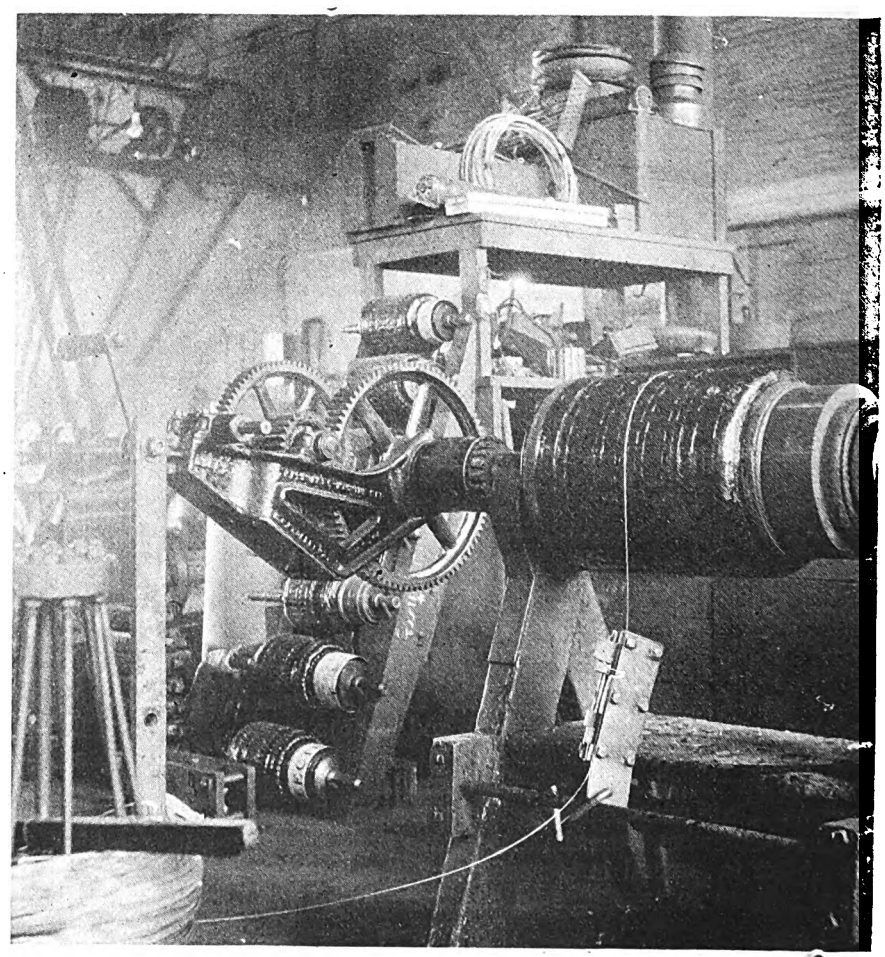
Revolving Gear Train for Banding

BANDING armatures in the shop of the Capital Traction Company, Washington, D. C., necessitated the transportation of the armatures from the armature room to the machine shop and the utilization of a lathe until Master Merchanic W. H. McCarty devised a means for revolving the armatures on the repair stands in the armature winding department. Having on hand a discarded train of Underwood portable boring bar gears, it was found that by a slight modification they could be made suitable to rotate an armature and thus permit of banding in the armature room.

A piece of ⅜-in. boiler plate about 6 in. long was shaped into a cylinder and installed on the master gear shaft. The inside diameter of this cylinder was made to permit of easy installation over the armature pinion. In the center of the cylinder, diametrically opposite, were inserted two ½-in. set screws.

When the gear train is placed in position one end is supported by the armature pinion and the other end by a ¾-in. x 2½-in. oak strip fastened to the gear train casting and projecting to the floor. Screwing the cylinder set screws in between the pinion teeth locks the gear train to the pinion and permits of uninterrupted power transmission. An 18-in. crank attached to this train of gears enables the operator to revolve an armature at any speed without very much physical effort.

This scheme has centralized the armature banding process and increased the armature room production by eliminating shop transportation with its resultant delays. Machine shop production has been improved, since the lathes have been released from banding and other work requiring lathes can proceed without interruption.



Gear train in place ready to revolve armature for banding in Capital Traction shop

Grinder Installed on Wheel Lathe

WHEELS from the cars of the Dallas Railway & Terminal Company, Dallas, Tex., in the shop for retreading are first built up by electric welding and then finished in a wheel lathe. It is not always necessary to take a cut to bring the wheel contour to standard. Many times it is possible to put the wheel in service without any machining, where the welding has been done on the flange

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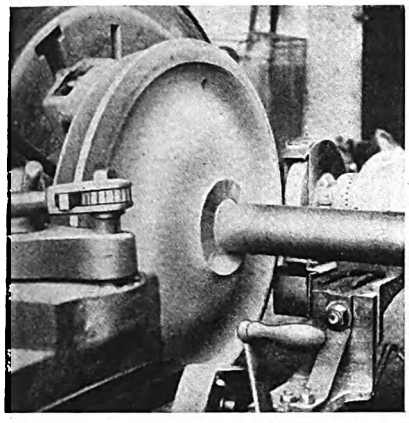


Grinder Installed on Wheel Lathe

Small 5-hp. motor and carborundum wheel mounted on rear carriage of wheel lathe to remove small imperfections in tread and flange contour. The carriage is moved longitudinally by the same feed screw that moves the main front tool carriage.

only. When only a slight amount of refinishing is necessary it is done with auxiliary electrically driven grinders on the lathe. As shown in the accompanying illustration, the motor grinding device is mounted on an auxiliary carriage which extends to the rear of the lathe. The motor is a 220-volt a.c., 5-hp. type and carries a 10-in. x 1½-in. carborundum wheel. It revolves at a speed of approximately 1,500 r.p.m.

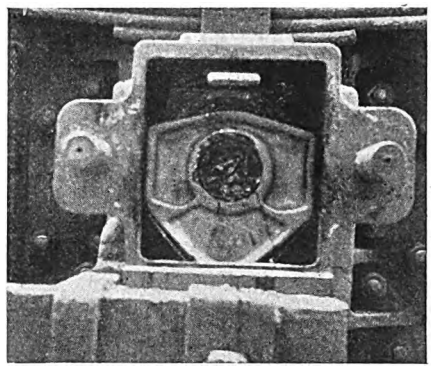
The longitudinal feed of both motors is similar to those of the main carriages and cutting tools. The cross-feed is by hand. In operation it is necessary only to set up the grinding wheel to the work and cut in the feed. Motors and accompanying grinding wheels move in opposite directions through the action of the transverse feed screw. This method for minor finishing of the wheel face and flange contours is more economical and produces better results than to take fine cuts with the tool, thereby removing the hardened surface so essential to maintaining long wheel life.

Journal Barrier Saves Oil and Packing

JOURNAL boxes on the cars of the London Underground Electric Railway, London, England, are packed with wool waste, as is the standard practice in this country. The inside of the housing is nearly square, and formerly the entire lower part was filled with wool packing, which was then soaked with oil. For some little time a different method has been used by which better lubrication is obtained with less use of oil and packing. A $\frac{1}{16}$-in. V-shaped steel perforated barrier goes all the way across the box in the position shown in the illustration. This barrier is in two parts. The packing is placed on top of it and the triangular portions in each corner act as reservoirs for free oil.

It has been found that this practice not only cuts down the amount of wool packing required by about half but the packing is held more closely against the axle and is not apt to get stiff and soggy. With this improved method, it is now possible to lubricate the car journals only once in six months instead of every month, as formerly. The London Underground Railway does not claim to be the originator of this method of oiling car journals, which has been employed with good results on the electrical division of the Victorian State Railways in Australia.

Incidentally, the London Underground is now recovering and straining used oil from its armature cups.



A perforated steel barrier cuts off the lower parts of the axle box, saving packing and giving better lubrication

After being drained from the cups, the oil is put through a large tank with electrical resistances underneath to keep the oil warm. It is then put through a gauze strainer, then through 6 in. of wool strainer. The recovered oil is used on suspension bearings and axles. About 2,600 gal. of oil a year is recovered in this way.

100 Ideas Presented

in Prize Contest

UP TO the time that this issue of ELECTRIC RAILWAY JOURNAL goes to press nearly 100 short articles have been received in the Maintenance Competition. Additional items will no doubt come in for the three capital prizes of $200, $100 and $50, as any contributions that bear a postmark dated before Aug. 1 will be eligible.

While this closes the contest for the three capital prizes, material sent in will continue to be eligible for the prizes of $25 to be awarded each month. This contest will run a year and manuscripts received up to April 30, 1928, will be accepted for the monthly prizes.

A.E.R.E.A. EXECUTIVE COMMITTEE RATIFIES APPOINTMENT OF JUDGES

The judges in the Maintenance Competition, consisting of A. T. Clark, chairman; Howard George, Charles Gordon, Guy C. Hecker and F. McVittie, who were informally appointed by President Daniel Durie of the American Electric Railway Engineering Association last May, were confirmed by the executive committee of the Engineering Association at a meeting held in New York on July 18, 1927. It was also voted that the committee of judges will be known as the ELECTRIC RAILWAY JOURNAL'S Maintenance Contest Committee. The judges have thus been made a committee of the association. The JOURNAL is very grateful to these men, who are giving their time in such a painstaking manner to study each article, analyze its good features and decide on the ones which possess most merit.

Here is a brief summary of the contest conditions:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the capital prizes the envelope must bear a postmark dated prior to Aug. 1, 1927. For the monthly prizes manuscripts will be received until April 30, 1928.
7. Illustration material may be in the form of drawings, sketches, blueprints, or photographs. All sheets should be marked "Maintenance Competition."
8. Details of the conditions not given above will be found in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

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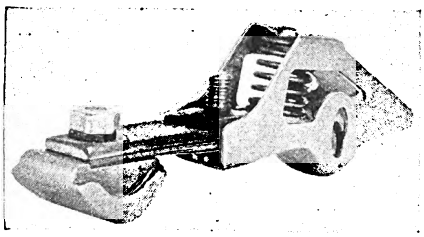
New Equipment Available

Hinged Type Controller Finger

PRACTICAL elimination of the trouble due to broken and bent fingers is claimed for a new hinged-type finger for railway controllers introduced by the General Electric Company, Schenectady, N. Y. Contact pressure is maintained by means of a rigid hinged arm and a spiral spring of steel. The arm carrying the tip is of steel and will not bend



A rigid hinged arm and a spiral spring maintain contact

or break. The hinge seats and rocks on a steel tongue which is narrow enough to allow full-width contact through the alignment of tip and segment. This feature reduces heating and burning of both segments and tips and prolongs their life. The finger is equiped with a removable tip, so that worn tips can be replaced.

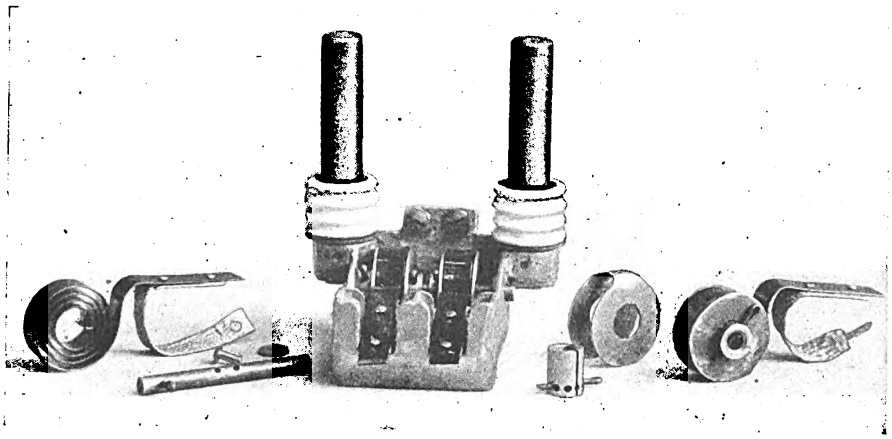
The new finger will shortly be furnished in all standard railway controllers and is available for finger replacements on many old types of controllers.

Improved Brush-holder for Replacing Old Types

SPRING pressure mechanism for brush-holders has been developed by the Westinghouse Electric & Manufacturing Company for use with railway motors. This pressure finger is simple in construction, with fewer wearing parts, and has a general application to a large number of the various old and new types of motor brush-holders.

The general construction of the twin washer type pressure finger can readily be seen from the illustration, which shows this mechanism in detail and assembled. There are no moving parts to wear the spindle or tension barrel, thus the danger of faulty spring action due to friction at the spindle is eliminated.

This mechanism has wide application, being applicable to both pin type and insulated bolt type brush-holders.



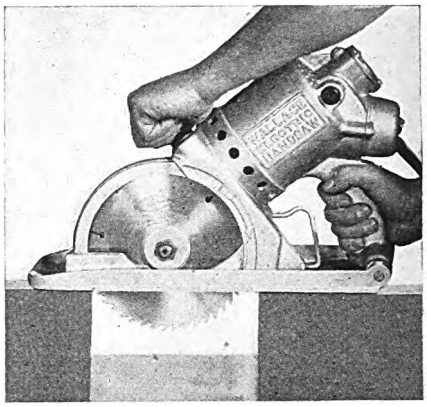
Spring pressure mechanism for brush-holder

Portable Electric Handsaw

FOR use in place of the ordinary handsaw for wood-working operations, a portable electric tool has been developed by J. D. Wallace & Company, Chicago, Ill. The saw is driven by an electric motor which can be used on either alternating or direct current circuits. The construction is such that a larger saw blade than intended cannot be put in the unit and so the motor cannot be overloaded.

The guard is locked in a position which covers the blade at all points. When the operator wishes to cut, he simply releases the safety guard by means of a trigger conveniently placed near the grip. When the cut is finished and the saw is lifted from the work the safety guard or shoe drops automatically and locks in position, covering the blade, and will not open again until released by the trigger.

With the depth gage which is provided, the saw can be set to cut accurately to any predetermined depth. A standard 8-in. round-hole blade is used. Ball bearings are incorporated in the construction and gears run in grease.

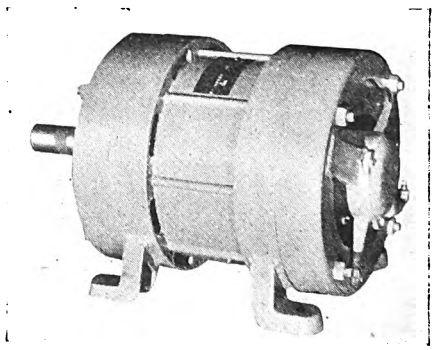


This type of electric handsaw is arranged with hand grips similar to those of an ordinary plane

Loose bearings—lose bearings

Rolled Steel Replaces Castings in Motor Construction

A COMPLETE line of polyphase induction motors in which gray iron and malleable castings have been replaced entirely by rolled steel is announced by the Lincoln Electric Company, Cleveland, Ohio. It is claimed that the various motor parts are more than twice as strong as the former types built with cast-iron framework. Economies in the new process have permitted the use of much larger shafts and bearings than are usually found with this type of equipment.



All-steel motor constructed of rolled steel shapes welded together

Owing to greater strength of steel as compared with cast iron, less thickness of metal is required in the frame. It is claimed that the increased ventilation so obtained results in a considerable increase in the overload capacity of the motor so that a continuous overload of from 10 to 15 per cent can be handled.

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Association Activities

The Sale of Railway Advertising Space*

By H. Samuelsen
Managing Director Oslo Tramways, Oslo, Norway

BASED upon 150 sets of replies to a questionnaire on car publicity, it appears that the profitable sale of advertising space under continental conditions demands that an electric railway serve 100,000 or more inhabitants.

Thirty-one (20 per cent) of the members said that they sold no advertising space, but this group includes several properties that are forbidden to do so.

Twenty-three (15 per cent) handle their advertising direct. This group includes such large cities as Basle, Duisburg, Kiel, Königsberg, Oslo, Utrecht and Zurich. On seven (5 per cent) of the properties, the advertising is handled by a subsidiary, as at Amsterdam, Elberfeld, Magdeburg and Munich.

The majority or 97 (about 66 per cent) of the properties lease their space through advertising agencies more or less territorial in character. This is the practice in such very large cities as Berlin, Hamburg, Stockholm and Copenhagen.

Standardization of Spaces Would Help Revenue

More revenue would accrue from carbody and platform advertising if the size and placing of the car card panels were standardized. The railway ought to retain such control over the shape, size, color and text of the announcements that it would not be possible—as has occurred—for them to become an annoyance instead of an attraction to the riders. A railway planning to handle advertising directly must not forget that this implies the employment of an advertising specialist and the use of art work. Furthermore, such a department should be made to stand upon its own bottom, because revenues from this source are likely to be fluctuating.

At present Oslo is handling its advertising through a subsidiary company. For a number of years its space was sold through a general advertising agency. This plan worked well enough for a time, but when business became slack, the advertising agency — which dealt with other kinds of advertising mediums as well—spent its advertising appropriations on them rather than with the railway.

The contractor had the advertising privileges on the backs of the fare receipts and tickets as well as in various ceiling, window and door spaces on the cars and, in part consideration, the receipts and tickets were printed without cost to the railway. The plan of handling the advertising in Oslo through a subsidiary is still on trial. It is in direct charge of an advertising specialist who is largely on a commission basis. So far, however, the fluctuations in the prices of merchandise due to shifts in the value of Norwegian money have made advertising solicitation very difficult.

The Various Forms of Car Advertising in Use

A list of various forms of European car advertising follows:

Within the car a most popular form is that of transparencies set in the upper window frames. These should be readily interchangeable and be protected against damage from water. Another form, of course is that of car cards or panels, set at convenient places along the sides and ends inside of the car. A third are ceiling car cards. As a rule, the so-called "permanent" advertisements with special lighting effects and the like are not desirable, because frequent change of copy is essential to the drawing power of advertising.

Almost all street railways make use of paper transparencies, and also of etching or sanding on glass. Several properties sell space on a clock hung from the center of the car ceiling.

Some cities, including Munich, forbid advertising on the outside of cars from esthetic considerations. On the other hand, Oslo and Budapest have long made use of illuminated roof side signs for advertising purposes. In Oslo, these signs are 3m. (9.8 ft.) long. Such signs are not recommended from an operating standpoint because they interfere with the route and destination signs. Colored roof signs without illumination are preferable. The confusion from illuminated roof signs might be overcome if the color of the lighting could be varied according to the route. Of 80 replies concerning outside advertising, 50 stated that they were users, but only Oslo and Budapest illuminate such advertising.

A few operators sell advertising space on the trolley pole (or bow collector). Dasher signs are very much worthwhile, but little progress seems to have been made in standardizing on size and in providing neat frames.

In Oslo, the vestibule sash carries an advertising structure which also serves as a sun visor for the motorman! Several operators have found room for advertising on the car trucks. However, it is possible that advertising will be so overdone that a car will lose whatever attractiveness it might have otherwise.

Recently, the Oslo Street Railway and the Norwegian State Railways (in its local stations) have added flashing or blinking advertisements in which the source of light is placed behind a mirror carrying the photograph, colored picture, lettering, etc. The subject is drawn double, so that it is visible in different ways, either through use of the special lighting source or by means of daylight or standard car illumination. These flashers are rented from the patentee on a 7½ per cent royalty basis.

A special charge is made in Oslo for placards advertising sporting events or other stimulators of "crush" traffic, on the theory that the cost of handling the ensuing peak service will be greater than usual. Little use has been made of outside placards along the car body. Suitable frames might develop this kind of publicity.

The Oslo system illuminates the car steps and offsets the cost by selling the riser space for advertising. It also sells advertising space on the car straps, which seem an especially desirable location for advertisements of gloves and manicure preparations. On the handholds on its cars, the Oslo system carries placards urging the user to "hold fast" to the article advertised. The use of lamp bases for Oslo car advertising is gradually declining.

A number of electric railways use enamel shield advertisements along the top edge of transverse car seats. Roof pennants are used occasionally in connection with the advertising of sporting events. They may be made of cloth,

*Abstract of paper read at the Copenhagen convention of the Internationaler Strassenbahn- und Kleinbahnverein, June 22-24, 1927.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Aug. 4*—New England Street Railway Club, annual outing, Whalom Park, Fitchburg, Mass.**

***Aug. 18-19*—Wisconsin Utilities Association, Transportation Section, annual convention, Hotel Pfister, Milwaukee, Wis.**

***Sept. 1-4*—Tenth Annual Conference on Human Relations in Industry, Silver Bay on Lake George, N. Y.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, South Bend, Ind.**

***Sept. 13-15*— International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting, Book-Cadillac Hotel, Detroit, Mich.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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metal, cardboard or fiber. The panels of platform doors and roller curtains also serve as advertising spaces at Oslo.

A clause in the Copenhagen contract requires the advertising agency to fill unsold roof spaces with ride-stimulating photographs of city attractions.

Dresden paints advertisements on the outside main panels of its cars. Oslo permits the outside of its cars to be covered with bunting, special signs or the like for advertising purposes. This latter is one form of theater advertising. In some instances, advertising space is sold on the face as well as the back of tickets and fare receipts.

Advertising Spaces in Addition to Car Use

In recent years there has been developed a sidewalk post style of advertising which combines the merit of indicating stopping places, car routes etc., with the production of advertising revenue. These poles or columns are of a porcelain-like material, which can be readily illuminated. Such columns are in use, or said to be under way, at Oslo, Amsterdam, Berlin (a pioneer), Dresden, Hamburg, Jena, Crefeld, Ruhr District, Magdeburg, Mannheim, Düsseldorf, Stettin and Stuttgart among others. Most of these four-sided columns are furnished by their different manufacturers on a rental basis.

The value of this type of publicity depends on the amount of competition. At Oslo, for example, its value would be little because advertisements are already carried on all of the city lampposts and trolley span wires. At Timisoara, Rumania, these posts are combined with illuminated clocks.

To some extent, space on the street span-wire poles has been sold for advertising. Span-wire advertising is usually of timely character, such as advertising an entertainment by means of pennants, flags, banners, etc.

Extended use of advertising space is made on railway structures, of both passenger and service type. Some also use the smokestacks of their power stations. Outside advertising in a number of cities is subject to the approval of an art commission.

All work of this kind should be marked by modesty of statement and artistry of treatment in advertising, partly to enhance its value and partly to meet the growing demand for greater civic beauty.

Suggested Standard Classification of Operating Data*

By Dr. William Mattersdorf
Manager Hamburg Elevated Railways, Germany

For most practical purposes, electric railway statistics may be divided into two groups. The first are of the order gathered for the International Association by K. Norregaard, managing director of the Copenhagen Tramways, and may be called "international" statistics. They include the following:

1. Number of inhabitants served.
2. Route length.
3. Vehicle-miles.
4. Tickets (or fare receipts) sold.
5. Revenue.
6. Total rides.
7. Annual rides per inhabitant.

**Abstract of report made to Copenhagen convention of the Internationaler Strassenbahn- und Kleinbahnverein, June 22-24, 1927. In the tables the English terms of weights, measures and money have been substituted for the German terms, to make the article more easily read in America.*

Table of Suggested Standard Classification of Statistics

	Unit Employed
OPERATION	
A—Equipment	
1—Amount of rolling stock, including reserves, per mile of route:	
(a)—Motor cars or locomotives	Number
(b)—Trailers or freight cars	Number
2—Proportion	
(a)—In use	Per cent
(b)—In repair	Per cent
(c)—Available for service	Per cent
3—Average schedule speed	Miles per hour
4—Average daily performance per vehicle in operation	Miles
5—Average number of cars per train	Number
B—Transportation Personnel	
6—Per mile of route	Number
Per car (total number of cars to be taken)	Number
Per passenger	Number
Per ton hauled	Number
Conductors per 10,000 vehicle-miles	Number
Motormen per 10,000 vehicle-miles	Number
7—Proportion of sick-leave days to working days	Per cent
Proportion of "days off" and vacations to working days	Per cent
C—Operating Performances	
8—Motor car miles per mile of route	Miles
9—Passengers carried or tons of freight moved	
(a)—Per car-mile	Persons or tons
(b)—Per mile of route	Persons or tons
(c)—Per car	Persons or tons
(d)—Per seat	Persons or tons
10—Cash passengers per car-mile	Persons
11—Pass and special-rate ticket users per car-mile	Persons
D—Operating Results	
12—Total revenue per revenue car-mile	Cents
Total revenue per passenger	Cents
Total revenue per ton of freight moved	Cents
13—Total expenses per active car-mile	Cents
Total expenses per passenger	Cents
Total expenses per ton of freight moved	Cents
14—Net income ratio, or total cost (including interest, taxes, etc.) divided by the total revenue.	
POWER	
1—Power Plants Operated	
Number of power stations	Number
Type of current generated	A.C.—D.C.
Voltage generated	Volts
Amount generated	Kilowatt-hours
Number of substations	Number
Direct current voltage	Volts
2—Purchased Energy	
Type of current	A.C.—D.C.
Voltage	Volts
Quantity	Kilowatt-hours
3—Personnel in Operator's Power Department	
Personnel for generating and distributing 100,000 kilowatt-hours at feeder points	Employees
Proportion of supervisory personnel to workmen	Per cent
Proportion of sick-leave days to working days	Per cent
Proportion of "days off" and vacations to working days	Per cent
4—Energy Consumption	
From own plants	Kilowatt-hours
Purchased	Kilowatt-hours
Proportion of own energy used for traction	Per cent
Proportion of purchased energy used for traction	Per cent
Proportion of all energy used from own plants	Per cent
Proportion of all energy used from purchased sources	Per cent
Proportion of total requirements delivered to others	Per cent
Energy consumption per motor car-mile	Watt-hours
Energy consumption per "Calculated" car-mile (in which a trail car-mile is calculated as one-half a motor car mile)	Watt-hours
Energy consumption per ton-mile	Watt-hours
5—Check on Energy Consumption	
Proportion of trailers per 100 motor car-miles	Per cent
Average load per car-mile, all types together	Persons
Average load per "Calculated" car-mile (estimated as above)	Persons
Energy consumption per passenger	Watt-hours
Average schedule speed	Miles per hour
6—Technical and Economic Data	
Average load of own power plants	Kilowatt-hours
Load factor of own power plants (average load divided by total capacity)	Per cent
Maximum load	Kilowatt-hours
Efficiency of generating-distributing system, viz., high tension—substation—low tension	Per cent
Coal consumption per kilowatt-hour generated	Pounds
Steam consumption per kilowatt-hour generated	Pounds
Steam per pound of coal	Pounds
Heat value of coal	B.t.u.
Cost of coal per ton	Dollars
Average monthly cost per kilowatt-hour of power as generated or purchased	Dollars
Proportion of cost due to fuel	Per cent
Proportion of cost due to labor and upkeep	Per cent
Cost of generated and purchased power per kilowatt-hour at railway feed-in points	Dollars
Coal-price clause as affecting:	
Power sold to others	.....
Power bought from others	.....
TROLLEY DISTRIBUTION SYSTEM	
1—Personnel (inspectors, also day laborers excluding tower truck drivers)	
Skilled workers per 1 mile of track length	Employees
Laborers per 1 mile of track length	Employees
Proportion of sick-leave days to working days	Per cent
Proportion of "days off" and vacations to working days	Per cent
Proportion of supervisory personnel for construction and upkeep to skilled workers	Per cent
2—Proportion of night-work hours to day hours	Per cent
3—Proportion of system equipped with two trolley wires	Per cent
4—Weight of trolley wire per running foot	Pounds
5—Average life of wire previous to renewal	.....
(a)—If rolling contact is used	.....
(b)—If sliding contact is used (aluminum)	.....
(c)—If sliding contact is used (carbon)	.....
Defects per 1 mile of track	.....
(a)—Contact wire breaks	.....
(b)—Span or other auxiliary wire breaks	.....
(c)—Insulation breaks	.....
(d)—Breaks of protective netting (trolley guards)	.....
7—Trolley feeders per 1 mile of track	Number
8—Copper core of feeder cables per 1 mile of track	Tons
9—Number of feeder points in the return circuit per mile of track	Number
10—Copper core of return cables per 1 mile of track	Tons
11—Cost of distribution system per 1 mile of track	.....
(a)—Maintenance	Dollars
(b)—Renewals	Dollars
(c)—Correction of interruptions	Dollars
(d)—Construction	Dollars

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Table of Suggested Standard Classification of Statistics (Continued)

ROLLING STOCK MAINTENANCE

1—Personnel of shops and carhouses, including all employees:	
(a)—Per 1000 total vehicle-miles, counting all cars alike	Employees
(b)—Per 1000 "Calculated" car-miles (counting trailer-miles as half a motor car-mile)	Employees
(c)—Per car total	.....
(d)—Per car (trailers counted as half a motor car)	.....
Proportion of supervisory personnel to workers	Per cent
2—Proportion of sick-leave days to working days	Per cent
Proportion of "days off" and vacations to working days	Per cent
3—Proportion of shop working hours used for other subdivisions and for other departments like overhead, way and structure, etc	Per cent
4—Average number of car-miles between main overhauls:	
(a)—Motor cars	Car-miles
(b)—Trailers	Car-miles
5—Time between main overhauls:	
(a)—For motor cars	Months
(b)—For trailers	Months
6—Monthly proportion of service and testing vehicles to total rolling stock:	
(a)—To motor cars	Per cent
(b)—To trailers	Per cent
7—Monthly proportion of passenger cars put through paint shop:	
(a)—Motor cars	Per cent
(b)—Trailers	Per cent
8—Cost of painting passenger cars per 1000 vehicle-miles (counting a trailer as one-half a motor car)	Dollars
9—Maintenance of equipment:	
(a)—Axle defects per 1000 car-miles	Number
(b)—Armature repairs per 1000 car-miles	Number
(c)—Dropped armatures per 1000 car-miles	Number
(d)—Field repairs per 1000 car-miles	Number
(e)—Electric track brake repairs per 1000 car-miles	Number
(f)—Collisions causing damage, per 1000 car-miles	Number
(g)—Cost of collision damage per 1000 motor car-miles	Number
10—Renewal of equipment parts:	
(a)—Armature bearings per 1000 car-miles	Number
(b)—Motor axle bearings per 1000 car-miles	Number
(c)—Pinions	Number
(d)—Gears per 1000 car-miles	Number
(e)—Gear cases per 1000 car-miles	Number
(f)—Journal bearings per 1000 car-miles	Number
(g)—Wheel (tire) life per 1000 car-miles	Number
11—Proportion of roller bearings to total:	
(a)—For motors	Per cent
(b)—For axles	Per cent
12—Proportion of different types of brakes in all cars:	
(a)—Air brakes	Per cent
(b)—Short-circuiting motor brakes	Per cent
(c)—Electric brakes using line current	Per cent
13—Main items of consumption:	
(a)—Lubrication per 1000 motor car-miles	Pounds
Lubrication per 1000 "Calculated" car-miles (trailer counted as one-half of motor car)	Pounds
(b)—Brakeshoe wear per 1000 motor car-miles	Number
Brakeshoe wear per 1000 "Calculated" car-miles	Number
(c)—Electric track brakeshoes per 1000 motor car-miles	Number
Electric track brakeshoes per 1000 "Calculated" car-miles	Number
14—Life of different materials, according to this formula: Car-miles x number of cars divided by consumption	
(a)—Wheels (tires)	Miles
(b)—Gears	Miles
(c)—Pinions	Miles
(d)—Motor brushes	Miles
(e)—Aluminum trolley contactors or bows	Miles
(f)—Carbon trolley contactors	Miles
(g)—Rolling contactors (or trolley wheels)	Miles
(h)—Brakeshoes	Miles

MAINTENANCE OF WAY

(By sections, type of rail, etc.)

1—Average monthly ton-miles load per mile of track	Ton-miles
2—Maximum speed	Miles per hour
3—Proportion of rail 45 to 60 ft. long	Per cent
4—Rail joints per mile of track	Number
5—Rail welds per mile of track:	
(a)—Thermit	Number
(b)—Electric	Number
6—Number of switches per mile of track	Number
7—Number of crossings per mile of track	Number
8—Personnel per mile of track:	
(a)—Along the line	Number
(b)—In the shops and yards	Number
9—Proportion of supervisory staff in construction and maintenance of workmen	Per cent
10—Proportion of sick-leave days to working days	Per cent
Proportion of "days off" and vacations to working days	Per cent
11—Proportion of night-work hours to day hours	Per cent
12—Proportion of total work given out on contract	Per cent
13—Expenses per mile of track:	
(a)—Maintenance	Dollars
(b)—Renewals	Dollars
(c)—Construction	Dollars
(d)—Corrugation removal	Dollars
(e)—Track cleaning (and greasing?—Editor)	Dollars
(f)—Snow removal	Dollars
14—Life of straight track:	
(a)—In monolithic construction	Years
(b)—On broken stone	Years
(c)—On longitudinal stringers	Years
(d)—On wooden cross-ties	Years
(e)—On metal ties	Years

8. Rides per mile of route.
9. Revenue per vehicle-mile.
10. Revenue passengers per vehicle-mile.
11. Average fare per passenger.
12. Number of passenger vehicles.
13. Vehicle capacity.
14. Schedule speed.
15. Kw.-hours per vehicle-mile.

These "International" units are of widely comparative nature. In addition, the manager of a property must set up a series of units that will enable him to judge the operation of his own undertaking.

In a paper presented at the 1921 convention the author recommended international standardization of report forms, schedule-making, etc. This proved too comprehensive, but the Verein der Deutschen Strassenbahnen (German Street Railway Association) had standardized on forms for operating data and is using them for interchange of information among its members. Later, the valuable suggestion was made that there be a clearing house of such facts. Small properties could use a briefer form of such statistics to advantage. In general, also, it is better to concentrate on a few items and follow their course intensively than to try to cover everything.

A tabulation of operating data, as approved by the German Street Railway Association for both passenger and freight service, appears on this and the preceding page. The more general use and publication by the different companies of such statistics of their properties should be of great mutual advantage.

Annual Vehicle-Miles per Platform Man in Europe*

By Dr. A. Winter

Secretary Internationaler Strassenbahn- und Kleinbahnverein, Vienna Tramways

BASED upon the questionnaire of conditions in 1925, prepared by K. Norregaard, Copenhagen, the author has prepared the following data to show the relation between schedule speed and the effective yearly mileage per platform man.

Of six railways (members of the association) whose schedule speed is within 12 km. (7.44 miles) per hour, three secured 30,000 car-km. (18,600 car-miles) per man and one attained up to 35,000 car km. (22,700 car-miles).

Of 23 railways whose schedule speed is within 13 km. (8.06 miles) per hour, eight attained 30,000 car-km. (18,600 car miles), ten attained 35,000 car-km. (22,700 car-miles) and three attained 40,000 car-km. (24,800 car-miles) or more per operative.

Of 25 railways whose schedule speed was 14 to 15 km. (8.68 to 9.3 miles) per hour, nine attained 35,000 car-km. (22,700 car-miles) and nine attained 40,000 car-km. (24,800 car-miles) or better.

No distinction has been made in this tabulation between street railways and those over private right-of-way, but it is noteworthy that of the twelve higher-speed lines remaining, four had an average of 35,000 car km. (22,700 car-miles), and seven of 40,000 car-km. (24,800 miles) or more per platform operative.

The mileage output per man is dependent not only on schedule speed, but also on the practice with regard to "days off" and length of vacations. Analysis of the 62 undertakings which reported on this aspect of operation indicated that there was no definite relation between number of single "days off" and length of vacations.

The vacation period was found to have the extraordinary range of three days to 30 days, but as an indication of the more customary periods, nineteen operators reported vacations of ten to twelve days, while the corresponding individual "days off" varied from 26 to 61. A second group of ten roads reported vacations of thirteen to fifteen days with individual "days off" ranging from 36 to 56 with a maximum of 91 per annum on Scandinavian or Far North railways.

Fifteen railways had vacations ranging from three to nine days; and eighteen railways had vacations exceeding fifteen days.

[Editor's Note: While Dr. Winter's report does not specifically so state, it is probable that a number of properties on which vacations exceed two weeks grant more than one vacation period in the course of the year, as at Easter.]

*Abstract of report made to Copenhagen convention of the Internationaler Strassenbahn- und Kleinbahnverein (International Street and Interurban Railway Association), June 22-24, 1927.

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News of the Industry

Talk Renewed in Chicago

Councilmen decide to draft own transit bills—Defer consideration of railway negotiations until Aug. 17

NEGOTIATIONS between the local transportation committee of the City Council and representatives of Chicago's electric railway and motor coach lines for an agreement as to what legislation shall be submitted to the special session of the Illinois Legislature next October in order that the city's transportation problems may be settled were postponed until Aug. 17, after a brief session on July 25. This was the first joint conference to be held since the demise of the five traction bills in the Legislature a month ago. Further action was deferred with the understanding that the five defeated bills will be at once submitted to the Corporation Counsel for an opinion on their constitutionality. When the city attorney's report is received the local transportation committee has decided to draft its own program and then submit it to the companies for approval, modification or rejection.

This course was determined upon when company representatives informed the committee that their views were and still are incorporated in the five traction bills. Speaking for the Chicago Surface Lines, Attorney James M. Sheean declared that the companies have not yet had an opportunity to examine the amendments attached to the bills in the House of Representatives. Feeling on the part of several Aldermen that the traction bills were defeated because the legislators believed they did not have the support of the Chicago City Council was another factor in the decision to let the transportation committee draft its own legislation. The plan was heartily indorsed by Leonard A. Busby, president of the Chicago City Railway, and Britton I. Budd, president of the Chicago Rapid Transit Company. Both declared that they did not believe the companies and the City Council were at any great variance on the fundamental questions involved.

All talk of submitting the ordinances to the voters prior to the enactment of enabling legislation was dropped by the Aldermen and company delegates at this conference. Both sides are now agreed that the laws should first be obtained at the special legislative session next October, leaving the ordinances based thereon for referendum action at a later date.

Aside from the problem of drafting new bills for the local companies, the transportation committee still has three other propositions to consider before a final settlement is reached. The first is the plan of the F. J. Lisman interests of New York, which contemplates consolidation of all lines under a twenty-year franchise. The two other schemes are that of Michael J. Flaherty, president of the Board of Local Improvements, to construct a system of downtown subways by special assessments under existing legislation, and that of Alderman Leonard J. Grossman, who last week presented plans of unnamed Eastern bankers for the construction of $460,000,000 of subways, covering the entire city, if granted a 50-year franchise.

Utility Helps City Park System

The Wisconsin Valley Electric Company has presented to the city of Wausau two small islands in the Wisconsin River. One is Stack Island, which lies west of Oak Island, now the property of the city, and the other is government lot No. 4, an unnamed island. The two islands are considered valuable additions to the Wausau city park system, as in time they can be beautified and made into recreation grounds.

Mayor Intervenes in New York

Arranges settlement at last minute that averts strike threatened by Amalgamated on Interborough—Amalgamated and company interpret promises differently

LATE on the afternoon of July 26, Mayor Walker of New York intervened and averted the issuance of a strike call to Interborough Rapid Transit Company employees at midnight by the Amalgamated Association. The Mayor succeeded in getting the Interborough to agree to re-employ thirteen men discharged earlier in the day for refusing to instruct strikebreakers and for attending a meeting of the Amalgamated the previous Friday night, and not to discriminate against them for membership in or sympathy with the Amalgamated. He also extracted a promise from the Amalgamated officers that they would, so far as was in their power, not raise the issue of union organization until the city's unification plan was completed. The summary dismissal of thirteen employees by the Interborough on July 26 hastened the crisis, and Amalgamated leaders declared during the day and as late as 3 p.m., when they went into conference with the Mayor, that the strike could no longer be averted.

In his letter to the men dismissed for attending the union meeting, President Hedley of the Interborough informed them that they had broken their agreement with the company. In a supplemental statement, Mr. Hedley asserted that no attention would be paid to the Amalgamated, and that any employees who may "become identified in any manner with that organization will break their contracts and be dismissed."

It was this situation that confronted the Mayor when he met the union officials shortly after 3 o'clock. He had on his desk the refusal of Mr. Hedley to appear, and also that of William S. Menden, president of the B.-M. T.

The Mayor pleaded with the leaders not to call a strike because of the city's pending unification plans and the project of the independent subway system. He pointed out that during his sixteen years of service in the State Legislature he had proposed many bills favoring organized labor. He told them of the great inconvenience that would be caused to millions by the strike. For the Interborough Mr. Quackenbush, general counsel, agreed the company would take back the discharged men without prejudice or discrimination against them for union activity.

General Organizer Coleman of the Amalgamated said:

> I consider this an important victory. It means that we can go right ahead organizing, secure in the knowledge that there will be no discrimination against our members on the Interborough and that any employees who are not members will be able to join our ranks without fear of discharge. What we sought was recognition, and we have got it.

The following day Mr. Coleman and Patrick Shea, leaders of the Amalgamated, summarized their viewpoint in the following statement, in the form of questions and answers:

Q.—Will you state clearly what was your understanding with the Mayor?

A.—We agreed to call off the strike last night if the companies in their turn agreed to this, as stated in the language of the Mayor in conversations with us, with officials of the companies and with newspaper reporters: "That every man discharged would be restored to his place and that no discrimination would be practiced against any employee of the companies because of his sympathy with or membership in the Amalgamated."

Q.—Did you give the Mayor an unconditional promise not to strike?

A.—We did not give an unconditional promise on any point. Every promise made was strictly conditioned upon fulfillment of promises made by the other party to the verbal agreement, and it was understood that each party placed himself under moral obligation to the Mayor to abide by these conditions.

Q.—What is your understanding of you. obligations under this agreement?

A.—We will carry out every obligation stated by the Mayor, in so far as it lies within our power, as long as the companies

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carry out their obligations, as stated by the Mayor to us. In the event that the companies violate the agreement we will go directly to the Mayor with the grievance in compliance with a request made by him, to us.

Q.—Would you consider the discharge of one of your members by the B.-M. T. or the I. R. T. as sufficient provocation for a strike?

A.—The Amalgamated always protects its members. That is its fundamental policy and its pride. But we have promised the Mayor that we will first come to him with any grievance, based upon violation of this agreement by either company. We are going to keep faith with the Mayor and follow out this agreement to the letter—and the agreement is clear if one wants to read it correctly.

How Counsel for the Company Sees It

Informed that Mr. Coleman had interpreted the Mayor's announcement to permit the Amalgamated to organize I. R. T. employees, Mr. Quackenbush said:

That is not the case, and it is what I expected. The Mayor, when he spoke to me, asked that no discrimination be made against the thirteen men who were discharged, and that, specifically, is all we agreed to do in that particular. The Amalgamated will break its promise if it attempts to organize I. R. T. employees, and will cause a reopening of this situation.

The attitude of the Interborough as stated by President Hedley to the Mayor was as follows:

Dear Mr. Mayor: I see that you have been requested by representatives of the Amalgamated to invite me to come to your office this afternoon (Saturday) for a conference with you in an effort to persuade those representatives from calling a strike upon the railroads operated by I. R. T.

I deem it my duty promptly to advise you that I must respectfully decline to attend any such conference for the following, among other, reasons:

The Amalgamated Association pretends to represent a majority of our employees but does not, in fact, represent enough employees of the Interborough to make any serious impression upon our operations if every one of them quit work.

On the other hand we have 12,673 loyal employees with whom we have amicable relations who have within the last few days reaffirmed their allegiance and expressed their satisfaction with the terms and conditions of their employment by the execution of a new contract of employment extending to April 30, 1929.

By the terms of this contract (which makes the constitution of the Brotherhood of Interborough Rapid Transit Company employees a part thereof) it is expressly agreed that no employee will become a member of or identified in any manner with the Amalgamated Association.

Employees Resentful of Amalgamated Interference

This brotherhood has been in existence since 1916. It was organized by our employees as a protest against the actions of this Amalgamated Association during the strike which that organization conducted in this city that year.

I am sure that at least 97 per cent of our employees would regard as a great breach of faith on my part any transactions either directly or indirectly with representatives of the Amalgamated Association.

I feel I am in a position to assure you that with adequate police protection, which I am certain will be afforded, no strike which the representatives of this Amalgamated Association can bring about will amount to any serious inconvenience to the people of this city, as far as the Interborough System is concerned.

As evidence of the correctness of this view permit me to call your attention to the fact that the much-heralded great mass meeting called last night in Brooklyn failed to muster more than 150 people in the hall during the entire night. Not more than eight employees of the Interborough were there, except those who were there to observe what took place.

I believe that the best interests of the public will be served by such actions on my part as will assure the continued good will of the Brotherhood of Interborough Employees. They have a contract which provides for collective bargaining and arbitration of disputes. The Amalgamated Association seeks to destroy this good will and to procure a breach of that contract. It is my duty to our men and to the public, as I see it, to have nothing to do with such wrongdoers.

The Supreme Court of New York has enjoined interference with the relations between the Interborough and its employees and the conduct of the Amalgamated representatives and of those aiding and abetting them is in contempt of that injunction, I am advised by counsel.

In view of all the circumstances I most respectfully request you to refrain from inviting me to any meeting having to do with the affairs of this Amalgamated Association.

At any time that you desire to see me on any other subject you may be sure of my immediate attendance.

Another Move in Seattle Litigation

Dormant for several weeks, Seattle's drawn-out railway litigation reappeared in federal court recently when J. G. Von Herberg, through his counsel, Robert P. Oldham, filed an answer in the case originally brought several months ago by Von Herberg to restrain the city's paying off its railway indebtedness until operation expenses are met. Von Herberg urges that the decree of *pro confesso* entered about a month ago against the Von Herberg suit be set aside. The matter was taken under advisement.

The decree was entered after more than 30 days had passed without Mr. Oldham attempting to file an answer to a cross-complaint entered by the Puget Sound Power & Light Company. Attorneys for the power company contended that they had informed Mr. Oldham several times that they were awaiting an answer to their cross-complaint. When none was filed they asked for the decree of confession.

Judge Neterer informed counsel for both litigants that he was anxious to get all motions and preliminary matters cleared away in order that the litigation could be decided on its merits when Circuit Judge Frank H. Deitrich arrived in Seattle for this purpose next month.

The issue which Judge Neterer desires to have settled is whether the bondholders or labor has the first lien on the gross revenues.

Bus and Subway Matters Approved

Board of Estimate finally grants operating right—Certificates of convenience still necessary

MAYOR WALKER of New York on July 28 succeeded in getting the Board of Estimate to award the bus franchise for Manhattan, Brooklyn and Queens to the Equitable Coach Company, the applicant he has favored from the start. The board also awarded the Bronx bus franchise to the Surface Transportation Corporation, a subsidiary of the Third Avenue Railway, and the bus franchise for Staten Island to the Tompkins Bus Corporation.

Earlier in the day the board approved plans for a complete subway system for Brooklyn consisting of eight routes, which will cost about $150,000,000 and will provide about 25 miles of new subways. Among the lines approved was the Fulton Street subway, construction of which is expected to lead ultimately to the elimination of the Fulton Street elevated line.

Crosstown Routes in Manhattan

The franchise granted the Equitable Company is for the routes originally proposed by the Board of Transportation, except that the longitudinal routes in Manhattan have been eliminated, leaving only the crosstown routes in this borough. This is in accordance with the proposal of Borough President Julius Miller, who at first sponsored the application of the Manhattan Surface Coach Company, a subsidiary of the New York Railways and the Fifth Avenue Coach Company.

The Equitable Coach Company under the terms of its franchise will operate seven crosstown routes in Manhattan, 24 in Brooklyn and 25 routes in Queens. The fare will be 5 cents with three zoned routes in Queens. The charge for transfers will be 2 cents. The right to operate is for five years with the privilege of renewal for five years.

The financing of the company is guaranteed by J. G. White & Company and the operation will be by the J. G. White Management Corporation. John H. Pardee, president of the Management Corporation, said the company deeply appreciated the action of the Board of Estimate in granting the franchise. He added:

The responsibilities which must be assumed under this franchise have been and are fully realized, and we wish to assure the public that the statements and promises which have been made during the past eighteen months of negotiations were made with full realization of such duties and responsibilities, and that the public will be more than satisfied with the bus system which will be established under such franchise.

The Surface Transportation Corporation will operate twelve routes in the Bronx. It will charge a 5-cent fare with four zoned routes and will give the city 5 per cent of its gross receipts.

The Tompkins Bus Corporation will operate eighteen routes on Staten Island.

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It will charge a 5-cent fare, give free transfers and give 3 per cent of its gross receipts to the city.

The Equitable Company, the Surface Transportation Corporation and the Tompkins Bus Corporation will apply at once to the Transit Commission for certificates of convenience and necessity. The commission's approval of the franchise holders' proposed methods of financing also is required. John H. Delaney, chairman of the Board of Transportation, expressed belief that the commission would deal with these matters expeditiously.

Many Physical Changes Recommended in Louisville Report

L. Segoe, city planner and traffic expert, and his assistant, H. H. Hemmings, employed by the Mayor's traffic committee some months ago to make a survey of the traffic situation in Louisville, Ky., recently completed their report. The findings have since been delivered and have been approved by the committee, which has been working on the plan for an improved traffic situation.

The report that has been approved is the first of two sets of findings to be made. It recommends many physical changes and many modifications on modes of handling traffic, and suggests traffic ordinances. The document contains about 60,000 words, with many diagrams and maps. The second report will deal with the future of traffic and is more of a city planning report. It will be filed later. The first report has now gone to Mayor J. T. O'Neal, with the committee's recommendations and full approval.

The most radical measure contained in the proposal would be that of taking the double car tracks off Fourth and Fifth Streets, replacing north and south lines with a single northbound line in the center of Fourth Street, and a single line, southbound on Fifth Street, extending from St. Catherine Street, to Main Street, a distance of about 1 mile, or through the business district and for about four to five blocks South.

One-way lines have been strongly opposed by the Louisville Railway and are also being strongly opposed by the Fourth Avenue merchants, as Louisville is virtually a one street town north and south, in so far as business is concerned. Changing its tracks would require the railway to build about a half-mile of line on Fifth Street and relay 1½ mile of double track line into a one track line.

The report suggests rerouting several of the existing car lines, and calls for safety islands along many of the railway lines on the more traveled streets. Trucks and wagons would be restricted to certain streets, during certain hours, and pedestrians would be forced to obey traffic signals. There would be a change made in boulevards, with some new ones.

Right-hand turns would be permitted at all intersections, but most left-hand turns prohibited in the congested section. There are 110 suggestions embodied in the first report.

Progress on Plan to Use Newark Canal Bed

Another conference in the series which have been held between representatives of the city of Newark, N. J., and the Public Service Railway on proposed plans to use the Morris Canal bed for railway service took place on July 21. Among the participants were Chief Engineer Costello, Corporation Counsel Congleton and Colonel Thomas F. Sullivan, chairman of the Boston Transit Commission and consulting engineer for the city, and Matthew R. Boylan, vice-president of the railway, and Martin Schreiber, superintendent of maintenance for the company. The conference was given over to a discussion of the details of the layout of the system. This took the conferees over types of construction, trackwork and platforms. Particular attention was paid to the advisability of laying out the system in the canal bed and constructing the platforms so that they could be used for a high-speed subway service that might be developed later. The work of preparing the contracts between the city and Public Service is now under way under direction of Mr. Congleton.

Two-Year Agreement in Providence Carries Increase

Acceptance of a new wage scale and working conditions agreed upon by the union officers and representatives of the United Electric Railways, Providence, R. I., featured two meetings, held on July 18 and July 19. The agreement is for two years. It carries a general increase of 2 cents an hour in all organized departments and is retroactive to June 1, 1927, a further increase of 1 cent an hour to take effect June 1, 1928.

Under the old scale, which expired at midnight on May 31, the rate of pay for motormen and conductors on two-man cars was 62 cents an hour, with one-man car operators and bus drivers receiving 68 cents an hour. Under the new agreement the two-man car operators will receive 64 cents until June 1, 1928, and one-man operators and bus drivers 70 cents. The rates from June 1, 1928, until the expiration of the agreement, May 31, 1929, will be 65 cents and 71 cents respectively. Similar increases will go into effect in the track, line, pit, freight and other departments, affecting a total of approximately 2,300 employees.

Among the provision looking toward better working conditions are the rearrangement of holiday and Sunday schedules; better pay for the men who operate the so-called "split runs" for the "intervals," or lost time between the time they complete a run on one route and take their cars out on another; a guarantee of seven hours pay for a thirteen-hour spread to spare conductors and motormen, one-man car operators and bus drivers for six days in each week and an additional seven hours pay if ordered to report for Sunday work; pay at the rate of time and a half for overtime in all departments, and a reduction in several departments in the working week of 54 hours, or six days of nine hours, to 50 hours, five nine-hour days and five hours on Saturdays.

This is the second time during the administration of the present board of officers that it has negotiated a wage agreement with the United Electric Railways over the conference table, without resorting to arbitration.

City Prepares Questionnaire in Buffalo Case

Corporation Counsel Frederic C. Rupp of Buffalo, N. Y., has prepared at the request of the City Council a questionnaire seeking information upon which the city expects to base its application for a return to the 8-cent fare. The compilation asks about 100 questions relating to allocation of properties of the International Railway, which recently was granted a 10-cent fare by the Public Service Commission, reproduction costs and valuation of specified portions of the company's property within the city of Buffalo. It has been sent to Michael F. Kearney, accountant for the state utilities board. Milo R. Maltbie, expert for the city, assisted in preparing the questions.

At the recent rehearing of the 10-cent fare case, the Public Service Commission granted the request of the municipal authorities to be permitted to question the state accountant about the property valuations of the railway.

Interurban Drops Passenger Service

Passenger service has been discontinued on the electric interurban of the Great Northern Railway, formerly the Inland system, between Spokane and Opportunity, Wash., a distance of about 15 miles. A private bus line will handle the business. Freight service will continue on the line. The Great Northern also dropped passenger trains between Spokane and Millwood and Pinecroft, about 10 miles, diverting that business to the bus line.

Work of Securing Rights-of-Way Being Pushed

According to information received at Winston-Salem, N. C., the officials of the Piedmont & Northern Railway are still securing rights-of-way for the proposed extension of the line from Charlotte to Winston-Salem. There has been no intimation as to what decision the Interstate Commerce Commission will reach in the contest entered by the Southern Railway and other steam railroads in their opposition to the building of what they term a competing road, but the towns and cities affected are known to be anxious to secure the new railway.

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Peter Witt to Quit Cleveland Council—Too Many "Yes" Men

Peter Witt, well known in electric railway circles, and at one time street railway commissioner of Cleveland, Ohio, is going to quit the Council of Cleveland, in January. Philip W. Porter, writing in the Cleveland *Plain Dealer*, says Mr. Witt will serve out his present term, but will not run for re-election in November. When he quits, he will quit politics "for keeps" and return to his practice as electric railway consultant.

According to Mr. Porter, Mr. Witt's departure will take most of the fire and the zest out of the Council sessions. Despite the fact that he has been consistently steam-rollered for four years, "his sharp tongue and indeed his very presence has had a powerful effect." The interviewer quoted Mr. Witt to this effect:

What's the use? There is no possibility that the coming election will bring forth a Council that would be worth while to sit with. The same old gang will be back. When I decided to run four years ago, I expected it would be a pleasure to sit in Council. I expected that issues would be debated in the Council, and differences of opinion hotly but honestly fought. I found, instead, a majority of "yes men," of rubber stamps, doing exactly what the city manager wanted. If I ran again, I could accomplish no more. So I'm going to quit. When I'm a private citizen again I won't see so much and it won't worry me.

On his own account Mr. Porter said:

For seven years following his retirement as traction commissioner, Mr. Witt practiced as a traction consultant. He spent a great deal of his time in distant cities, and was engaged for street railway advice in Newark, N. J.; Seattle, Wash.; Lynn, Mass.; Youngstown, Philadelphia, and several other cities. He had a five-year contract in Philadelphia.

He intends to return to this profession, but he has also a sideline on which to concentrate. It is the promotion of the Automobile Owners Protective League, which he organized to support a constitutional amendment that will make taxation of automobiles impossible.

Fare Survey Being Made by Holyoke Street Railway

The Holyoke Street Railway, Holyoke, Mass., has been making a survey with a view to readjusting fares on its system, and it is expected that the new tariffs soon will be filed with the Public Utilities Commission. For about ten years this company has operated on 6-cent fares with a zone system, with no transfer privilege. Minor readjustments of the zone system are contemplated, chiefly to accommodate the needs of patrons living in expanded residence areas. City Hall is a fare limit on all lines at present, and the privilege of riding from there to Dwight and Race Streets, and vice versa, without paying an extra fare has been urgently sought by the patrons of lines running from the residence districts. This issue, arising from the fact that Holyoke has two long business streets separated to quite an extent by a canal system, is likely to come up anew in connection with the proposed readjustments. Further than that the zone system will remain substantially as it is. A move for an increase of fares is likely, but reports concerning the company's plans are indefinite.

Complainants Against Service Visited in New Jersey

A novel plan of handling complaints in connection with service on lines of the Public Service Corporation of New Jersey has been started by that company. The procedure is to forward a copy of the complaint to the supervisor in charge of the line, who makes a personal call on the complainant to explain the cause of the complaint and discuss the remedy. If the trouble is due to discourtesy the offending employee is expected to make such amends for his conduct as are possible by personal apology.

Passes Increasingly Popular on Stark Electric

After issuing unlimited-ride Sunday passes for little more than a year under the direction of F. W. Sweezy, general manager, officials of the Stark Electric Company, Alliance, Ohio, consider the plan successful for increasing revenue from week-end travel.

During the hot summer months the sale of Sunday passes shows a slump, caused by many people going out in machines or to near-by parks, but in spite of this, the average Sunday sale is nearly three times as great as was that of the first Sunday the passes were offered.

Besides the Sunday passes, the company offers the same rate for holidays. Adults pay 50 cents for any point on the interurban division, 32 miles in length, while children pay 25 cents. These tickets are good all day, for any number of rides.

The first Sunday, July 4, 1926, the company sold approximately 325 passes. Since then the sales have increased to about 1,000 passes during the spring months. At present, during the hot weather the average is about 800. Holiday pass sales reveal that 800 rode last Labor Day on passes; 530 on Thanksgiving; 590 on Christmas; 345 on New Year's and 350 on Washington's Birthday. The two main holidays this year have been on a Monday, giving two days of special passes. For Memorial Day there were 700 on Sunday and 750 on Monday. For July 4 there were 700 on Sunday and almost 1,100 on Monday.

The Stark Electric considers that by the pass system Sunday travel has increased at least 40 per cent. With this increase the reduced rate still shows a neat profit over the former Sunday business at ordinary rates.

In addition to the Sunday passes, the Stark Electric offers nine weekly passes for various points along the system. Practically all of them are considered profitable by company officials.

Increase in Rates Sought by Schenectady Railway

The Schenectady Railway, Schenectady, N. Y., on July 26 asked the Public Service Commission to determine a reasonable rate of fare on its lines in Schenectady, Albany, Rensselaer and Saratoga Counties under Section 49 of the public service commission law, and for authority to put such fares into effect under Section 29 of the same law.

The company says that in 1926 there was a deficit of $201,022 in its operating income and that its net operating income from 1920 to 1926 inclusive has been $92,198 for this period. It says that the rates of fare which it favors will not produce an annual operating income in excess of $360,000, a sum insufficient to give a reasonable return on the value of the property devoted to the public use.

The present rates in Schenectady are 7 cents full fare and 2½ cents for school tokens. The rates proposed are 10 cents full fare and 5 cents for school tokens. On the Albany division it is proposed to increase the full zone fare from 5 to 10 cents. Commutation tickets for 50 rides between stops 6 and 33 are proposed to be increased from $4.65 to $9.30; between stops 6 and 23 from $3.10 to $6.20 and between stops 14 and 33 from $3.10 to $6.20. On the Troy division zone fares are to be increased from 7 to 10 cents and commutation tickets, 50 rides, stops 10 to 42, from $5.50 to $7.80; stops 10 to 36 and stops 23 to 42 from $3.65 to $5.20 and the one zone school ticket from $2 to $2.50. On the Saratoga division zone fares are proposed to be increased from 7 to 10 cents and commutation tickets, 50 rides, as follows: Between Alplaus and Ballston Lake, from $2.75 to $3.95; Alplaus and Timesons, $4.50 to $6.40; Alplaus and Brookline, $6.75 to $9.65; Alplaus and Ballston Junction $9 to $12.85; Ballston Lake and Ballston Junction, $6.25 to $9; Ballston and Saratoga, twelve rides, $1.92 to $2.40, and one zone school ticket from $2 to $2.50.

Aurora-Elgin Line Plans Increase in Commutation Rates

Suburban commutation rates averaging 15 to 20 per cent higher than the present level will be established on Aug. 1 by the Chicago, Aurora & Elgin Railroad. Permission to increase the rates was granted by the Illinois Commerce Commission several months ago, but until now no action has been taken by the railroad.

According to figures presented in the petition filed with the commission on June 15, 1926, the average increase in costs of operation and other expenses has been more than 110 per cent since 1914, as compared with an advance of only 24.4 per cent in fares over the same period. It was pointed out that the increase would bring the rates of the line up to existing commutation rates of competing steam railroads. In

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contending that earnings on the company's investment are grossly inadequate, the petition explained that the territory served by the line is one of the most prosperous sections in the country.

Smile with the Dallas Railway & Terminal Company

The Dallas Railway & Terminal Company, Dallas, Texas, has indorsed the habit of smiling. "Cut-out Cards," telling the difference between the number of muscles required to frown and the number to smile, have been placed on the telephones throughout the city with the compliments of the utility, "partners in the growth of Dallas."

Sales Talk to Baltimore Men in Book Form

"Selling Bus Business," is now in pamphlet form for ready use by the employees of the United Railways & Electric Company, Baltimore, Md. In a nineteen-page booklet these valuable sales points, thoughts of Dwight Burroughs, publicity agent of the company, and first printed in the company magazine, *Trolley Topics,* are attractively and succinctly presented. Reference was made to the employees' part in the selling of chartered bus service in the ELECTRIC RAILWAY JOURNAL, issue of July 9, page 79.

Skip Stops for Baltimore Upheld

An order granting permission to the United Railways & Electric Company, Baltimore, to continue the skip-stop system put into operation last November has been passed by the Maryland Public Service Commission. The skip-stop system is used during the morning and evening rush hours. It brought about many protests when started. In handing down the order the commission reserved the right to regulate the system. The plan was recommended by the Traffic Survey Commission.

The commission said that it fells that the limited stop plan is still in an experimental stage, that it may possibly be extended if traffic conditions make it necessary, or it may be abandoned if it does not effect a real saving of time or if some better means of speeding up traffic is devised. The commission said that it will carefully observe the results and no extension of the system will be permitted without its permission.

The opinion of the commission is that the skip-stop has been helpful in eliminating the difficulty caused by the bunching of cars in complying with the traffic light signals. The streets intended for the movement of traffic have, in the downtown section particularly, become little more than storage places for automobiles, the commission said, a narrow line in the center only being left open for moving traffic. It is pointed out that this has been an especial burden on the street-car rider because all moving traffic is forced on the car tracks. The commission says:

Modern methods of controlling automobile traffic, such as automatic signal lights, however desirable and necessary they may be for that purpose, have put an added burden of delay on the street cars. It may be highly desirable to move automobile traffic in fleets, but street cars are intended to run on schedules and bunching them in fleets with automobiles is destructive to schedules.

Passengers Help Select Seats

The Texas Electric Railway has asked its passengers to aid it in the selection of the most desirable type of seats for its passenger cars. An interurban car in service between Dallas and Waco has been equipped with several types of the most modern seats offered by leading manufacturers and passengers have shown much interest in expressing their preferences. Several thousand votes have been deposited with conductors by passengers who filled in the forms provided for this purpose. In several instances more than a formal vote was cast, important suggestions being offered for the improvement of passenger comfort in the cars.

When a decision has been reached as to the most desirable type of seat the company will change the seating in its cars to this type. In the reseating of its cars a decided innovation will be the rearrangement of seats so that they will be a greater distance apart than at present. They will be relocated without regard to windows.

James P. Griffin, vice-president and general manager of the Texas Electric Railway, conceived the plan of allowing passengers to express their seat preference and several seat manufacturers have co-operated by furnishing sample seats for equipping the car.

Ten Cents in Erie

The railway fare in Erie, Pa., will be advanced from 8 cents to 10 cents with tickets at the rate of six for 50 cents on Aug. 15. A new tariff providing for such change has been filed by the Erie Railway with the Public Service Commission. A statement issued by A. R. Myers, president, declared high operating costs and competition with automobiles were factors that made the increase in fares necessary.

Cars Burned As Junk

Twelve street cars of the Key System Transit Company, Oakland, Cal., which had outlived their usefulness made good fuel for a large fire recently. The bodies were lifted from the trucks with a derrick and thrown into a pile, whereupon a match was lighted and $120,000 of old equipment went up in flames. The old cars had been replaced by new steel ones. A year ago the company burned a similar batch of cars considered too antiquated.

Corporation Counsel Presents New Omaha Franchise Draft

The tentative draft of a new franchise for the Omaha & Council Bluffs Street Railway, Omaha, Neb., has been presented by Corporation Counsel Van Dusen for the city. He says that it differs in many respects from the franchise that was defeated by the voters and from other drafts, with provisions intended to protest the city against such claims as are now being made by the Guaranty Trust Company in the interest of the bondholders. The draft is intended to form a working basis for negotiations. Mr. VanDusen says that the law giving the city power to draft and submit its own franchise is ambiguous and vague and he thinks it might be necessary to get a Supreme Court decision to fix the full extent of the city's powers.

Mr. Van Dusen says that his draft does not touch on any of these matters: Electrolysis, free fare for policemen, firemen and letter carriers, sale of electric power, freight service, restrictions on single or double tracks, removal of snow and ice, sprinkling streets and other matters. He does give the company the right to operate buses, a new thing in similar franchises. No mention is made of the bridge across the river owned by a subsidiary company.

The right is reserved to the city to order extensions and to regulate car stops. The draft seeks to restrict any subsequent legislation enlarging the company's powers unless the people affirm the changes by vote.

Some of the terms of the new grant are said not to be acceptable to the company since they would render adequate service difficult if not impossible and make it extremely unlikely that the refinancing could be accomplished that must be done by next January.

President Hamilton says the draft is valuable only in that it forms the basis of discussion and negotiation with the Council. He continues in a statement made public:

The primary object of each party is to provide for public transportation. This makes it very important that the governing authority shall have in mind the best interests of the public as a whole. It is equally important that the company shall have in mind that the real purpose of its business is the transportation of the public.

Our examination leads us to conclude that in some of the sections are found provisions that render adequate operation difficult, if not impossible. There are also provisions which would make it extremely difficult to refinance the funded debt and obtain the additional capital required from time to time to keep pace with the growth of the city.

We hope to negotiate with the city in open meeting and present our opinions respecting the changes that are necessary. Courtesy requires that we shall meet with the City Council and discuss the various provisions rather than present any specific views first through the public press.

Various neighborhood civic improvement clubs have announced debates and discussions on the franchise as proposed.

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Recent Bus Developments

Service Between Springfield and Chicopee

Bus service between Springfield and Market Square, Chicopee, was started on July 24 by the Springfield Street Railway, Springfield, Mass., and on the following day the process of removing the company's tracks between the Springfield city line and Market Square, Chicopee, was begun. The new Chicopee service takes the place of the car service long maintained by way of Glenwood and is a continuation of the bus line previously running through Armory Street, Springfield, to Hamburg Street, at the city line. Three new buses were put into service with this extension.

Would Make Bus Service Permanent

The Spokane, Portland & Seattle Railway has filed with the city auditor of Portland, Ore., an appeal asking that the temporary franchise substituting bus service for railway service in the Kings Heights district be made permanent. The temporary service has been in use for about three months and the company states that it is convinced the public favors the automobile service, and that therefore it should be made permanent.

Another Bus Substitution in Connecticut

The Connecticut Company, Bridgeport, Conn., has abandoned railway service over a 6-mile stretch between Pecks Mills and Derby, Conn. Bus service will be substituted at once. The state is building a new highway between Stratford and Derby and the railway did not see fit to relay the tracks this improvement would necessitate. The plan was considered two years ago and permission obtained at that time from the Public Utilities Company to substitute bus service. Trolley service will be maintained between Bridgeport and Pecks Mills, Stratford. The Bridgeport-Derby line had been in operation since August, 1898.

Indianapolis Railway Will Appeal Case

The Indianapolis Street Railway, Indiaiapolis, Ind., will appeal to the Marion County Circuit Court the decision of the Public Service Commission, which on June 10 denied a second time the petition of the company to purchase the stock of the Peoples Motor Coach Company for $500,000. Utilities in Indiana have the right to appeal from the commission to the Circuit Court under a new law of this year.

The petition was refused at the first hearing on the grounds that the price proposed was in excess of the actual value of the property of the bus company and that the railway in its present financial condition would be unable to stand the financial strain resulting from the purchase. The commission upheld its original decision at the rehearing. The railway will now appeal to the Circuit Court.

Temporary Victory for Muncie, Ind., Bus Operators

Bus operators at Muncie, Ind., scored a temporary victory recently when the Indiana Supreme Court announced a ruling that a return made by attorneys for the Union Traction Company of Indiana to a writ of prohibition filed by the bus operators was insufficient. The railway last fall obtained an order from the Circuit Court at Anderson enjoining the Muncie bus operators from driving in competition with the railway. The bus operators refused to comply with the order and the company sought to have them held in contempt of court. That was the beginning of the action in the Supreme Court which seeks to prohibit the Madison County Court from punishing the operators for contempt.

The final chapter in the matter, however, still remains to be written, for the case has been taken to the United States District Court in Indianapolis by the Equitable Trust Company, New York. That company seeks to enjoin the buses so as to prevent injury to bonds secured by mortgages on property of the Union Traction Company, of which the plaintiff is trustee. The petition also asks that the defendants be required to obtain proper certificates. The suit explains that a decision in the Circuit Court at Anderson, Ind., was set aside by the Indiana Supreme Court, which ruled that the Madison court had no jurisdiction.

Municipal Bus Project in Buffalo Collapses

Another attempt by Mayor Frank X. Schwab of Buffalo, N. Y., to establish municipal bus service has collapsed and the 3-cent line in the Kensington district will be discontinued on Aug. 1. Mayor Schwab says patronage was not sufficient to justify the continued expenditure of public funds for the maintenance of the service. The amount of the deficit was not reported by the Mayor to the City Council, but it was said by the Mayor to be several thousand dollars. City operation of bus lines has been held illegal by the courts, but the Mayor started the service some months ago declaring a transportation emergency existed in the Kensington district of the city. Application of the International Bus Corporation, a subsidiary of the International Railway, for permission to operate a bus line in the Kensington section was rejected by the municipal authorities.

More Routes in Westchester

With the institution in Mamaroneck and Larchmont of an interweaving bus system by the County Transportation Company, these communities were linked on July 24 by motor coach lines with their railway stations and with Rye Beach. The new bus lines have their western terminus at the old Larchmont Manor electric railway terminal. The Manor trolley line was abandoned when the motor coaches went into service. The Manor buses now run on Larchmont Avenue to the station of the New York, Westchester & Boston Railway. Here connection is made with the Larchmont-Mamaroneck bus line and with the Larchmont-Rye Beach line. Free transfers are issued to cars of the New York & Standard Railway. The route of the Larchmont-Rye Beach line is from the Larchmont station of the Westchester & Boston Railway to the beach.

Napa Valley Route Approved

Denying the petition of the California Transit Company for a rehearing of its formerly denied petition for a permit to operate a line of stages between Vallejo and Calistoga, the Railroad Commission recently removed the last obstacle of the San Francisco, Napa & Calistoga Railway to operate a line of buses over the same route in connection with its train service.

The stage subsidiary will be known as the Napa Valley Bus Company. Instead of a train, a bus will meet the last San Francisco boat at Vallejo and run through to Calistoga. Buses will not be run when the travel justifies the operation of trains.

Municipal Line Suggested for Los Angeles

Asking that the city establish a municipal bus line between some central point in Los Angeles and the beach city of Venice, now included in the corporate limits of the city of Los Angeles, a petition containing more than 30,000 names was filed with the city clerk of Los Angeles on July 21. The petition was referred to the Public Utilities and Transportation Commission and the public utilities committee of the City Council. An early report and recommendation was urged. The petition asked that the municipal bus line run on Venice Boulevard and that the funds for its establishment be appropriated from the general fund of the city, that one-way fares be 15 cents, round trip 25 cents, that commutation books be issued and that the line be operated by the city. At the present time transportation at the beach cities is furnished by the Pacific Electric Railway.

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Financial and Corporate

Committee Charges Partisanship in Chicago Receivership

A petition seeking the removal of one or more of the three receivers of the Chicago Railways was filed on July 14 with Federal Judge James H. Wilkinson by a protective committee of owners of the railroad's stock certificates.

The petition charges that some of the receivers are in a conspiracy with Samuel Insull, chairman of the Chicago Rapid Transit Company, and certain Chicago banks holding the bonds of the company to "freeze out" holders of the series I certificates. The three receivers appointed last December by Judge Wilkerson are Henry A. Blair, president of the Chicago Surface Lines; John J. Mitchell, chairman of the Illinois Merchants Trust Company, and Frederick H. Rawson, president of the Union Trust Company.

It is alleged in the committee's petition that the equity of the original stockholders of the company is about to be injured by a scheme entered into by Messrs. Blair and Insull and the various trust companies holding the mortgages of the company to foreclose on one or more of the mortgages against the company's properties. When this has been accomplished, the committee charges, a reorganization plan is contemplated from which original stockholders are to be excluded. The petition further contends that the removal of one or more of the receivers should be considered an emergency matter and acted upon immediately.

The certificate holders' protective committee has been endeavoring for some time to secure court recognition of its claims to the right to be represented in the negotiations for the settlement of the local railway problem.

Objections to the filing of the petition were made by attorneys for the Surface Lines and the Harris Trust and Savings Bank, one of the trustees. They suggested that permission to file the petition be withheld until next fall, when arguments might be heard.

Riding and Earnings of Chicago Surface Lines Decrease

After a record of 24 consecutive months in which gains were made in passenger traffic over the corresponding month of the preceding year, the Chicago Surface Lines reported on July 20 a moderate decrease in both passengers carried and total revenue for June as compared with the similar month of 1926. There were 131,583,475 riders last month, as against 131,980,301 in June of last year.

Divisible receipts for the period were $417,814, compared with $446,005 in the similar month a year ago. Gross earnings from all sources for the month were $5,122,007, against $5,135,965 in June, 1926. It is pointed out, however, that the lines carried considerably more than the normal June traffic last year, due to the Eucharistic Congress. No similar factors entered into the June figures this year.

Judgment Creditor Proceeds Against New York Interurban

Application will be made within the next few weeks to County Judge Thomas H. Noonan in Buffalo by the Olean, Bradford & Salamanca Railway, Olean, N. Y., for permission to abandon its interurban lines and scrap its equipment. Former Judge Frederick W. Kruse, Olean, who has been serving as receiver for the company's properties since Aug. 30, 1926, is seeking authority to abandon the line. The Forbes Motor Agency, Olean, has a judgment against the railway and has obtained a court order directing the company to show cause why its equipment should not be scrapped. Opposition to the abandonment of the interurban has developed in the communities served by the line.

Simplification of London Underground Financial Structure

Holders of 6 per cent income bonds of the Underground Electric Railways, London, Ltd., will meet in London on Aug. 5 to approve a plan which would make interest on the bonds subject to British income taxes instead of being tax-free as at present; make the bonds irredeemable until June 30, 1929; redeemable at 103 from that date to June 30, 1937, and thereafter at par, instead of being as at present redeemable at par on six months notice, and give holders of the bonds the right until June 30, 1929, to convert their bonds into £1 ordinary shares at £1 2 shillings a share. The plan also provides for the issuance of more 4½ per cent bonds of 1933, or other securities ranking in priority to the income bonds on condition that further collateral be pledged as security. It is also provided that as income bonds are converted or redeemed a suitable proportion of securities pledged as collateral shall be released.

The share capital of the company is to be increased by the creation of not less than 5,800,000 new £1 ordinary shares and the necessary amount of such ordinary shares to meet the conversion rights of the income bondholders to be retained unissued until after June 30, 1929.

The plan is described as a step toward placing the company's capital on a wider and simpler basis and substituting other securities, at a lower annual cost to the company, for those outstanding.

To Proceed with St. Louis Purchase

Following the announcement by Mayor Miller of St. Louis, Mo., that he will not sponsor a new railway franchise at this time, the St. Louis Public Service Company stated that it will go through with its plans for the purchase of the properties of the United Railways at foreclosure proceedings. The new company may operate under the old franchise, which has at least twelve years to run, or obtain a new grant from the Board of Aldermen or by direct vote of the people.

Articles of incorporation were filed on July 20 for a new company, known as the City Suburban Public Service Company, as a subsidiary of the St. Louis Public Service Company. It is intended merely to be part of the machinery necessary to complete the reorganization of the railway with reference to suburban lines. Another subsidiary, the St. Louis Bus Company, was formed many months ago to meet the steadily growing competition of the People's Motorbus Company.

The United Railways in the quarter ended June 30 carried 62,761,114 passengers, compared with 64,972,511 for the corresponding period in 1926. In the quarter ended March 31 the company carried 63,371,709 passengers.

The Public Service Commission on July 23 overruled the motion filed by the United Railways for a modification of the commission's order of June 25, which fixed the tentative rate-base valuation of the company's properties at $52,024,000 as of Dec. 31, 1926. The order of June 25 granted the company a temporary increase in fares of 8 cents or two tokens for 15 cents compared with the old rate of 7 cents straight for adults.

The company had filed a motion accepting the temporary fare, but asked the commission to modify its findings concerning the tentative valuation, return and certain deductions in depreciation. The railway sought a tentative valuation of not less than $75,000,000 and also sought to be credited with $6,183,009 accrued in the company's depreciation reserve fund as part of its valuation.

Neither the order of June 25 nor the subsequent action on July 23 affects the rate and valuation case now pending before the commission.

Protective Committee for Northern Indiana Holders

As result of appointment of a receiver for the Chicago, South Bend & Northern Indiana Railway on July 9, a protective committee has been formed to represent bondholders in the consideration of any readjustment plan. The issues which the committee will represent are the first mortgage 5 per cent 30-year bonds, due 1937, of the Chicago, South Bend & Northern Indiana Railway; La Porte & Michigan City Traction Company 5 per cent 25-year first

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mortgage bonds, due 1930, and Northern Indiana Railway first consolidated mortgage 5 per cent, due 1935. Charles F. Dieterich is chairman of the committee, which comprises A. L. Kitselman, A. Gordon Murdock and Amos H. Plumb. Sherman Allen of New York City, will act as secretary for the committee and Shearman & Sterling will act as counsel.

Omaha Earnings Better

The Omaha & Council Bluffs Street Railway, Omaha, Neb., in its June report, made to the Nebraska State Railway Commission, shows transportation revenues of $230,636, for June, 1927, compared with $243,350 for June, 1926, but a $21,000 reduction in operating expense and a $3,000 cut in taxes. These reductions enabled the company to show a surplus after interest and taxes of $987, whereas for June, 1926, the company went into the red $8,956. Gross revenues in June, 1927, were $235,630, operating expenses $167,829, taxes $27,212 and income after taxes and before interest and miscellaneous payments $39,178. Interest was $37,479 and total deductions $38,191.

Philadelphia Figures for Six Months

The income account and passenger statistics of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the first six months of the present year are as follows:

INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT

	Six Months Ended June 30, 1927	Three Months Ended June 30, 1927
Operating revenue	$29,108,089	$14,618,250
Operation and taxes	22,304,401	11,227,439
Operating income	$6,803,688	$3,390,811
Non-operating income	451,889	242,044
	$7,255,577	$3,632,855
Payments to city: sinking fund and Frankford elevated	480,099	240,049
	$6,775,477	$3,392,806
Fixed charges and dividends	6,745,631	3,378,463
Surplus	$29,846	$14,342

PASSENGER STATISTICS

	Six Months Ended June 30, 1927 — Passenger Revenue	Passengers Carried	Average Rate per Passenger, Cents
Surface subway and elevated	$24,288,916	461,433,811	5.25
Motor bus	1,469,951	16,024,530	9.17
	$25,698,867	477,458,341	5.38
Taxi	2,980,674		
Total	$28,679,531		

	Six Months Ended June 30, 1926 — Passenger Revenue	Passengers Carried	Average Rate per Passenger, Cents
Surface subway and elevated	$25,011,821	469,916,443	5.32
Motor bus	1,269,292	13,655,498	9.30
	$26,281,114	483,571,941	5.43

Default Ahead for Puget Sound Electric Railway

The Puget Sound Electric Railway, which is controlled by the Puget Sound Power & Light Company, is notifying holders of its $2,427,000 outstanding first consolidated mortgage 5 per cent gold bonds that it will be compelled to default the next interest coupon, due on Aug. 1.

The Puget Sound Power & Light Company, acquired the capital stock of the Puget Sound Electric Railway in 1912. It has never received any dividends on these holdings, and the only return which it has received on its entire investment in Puget Sound Electric Railway consists of interest payments aggregating $153,849. Up to the present the power company has advanced the moneys necessary to meet the financial requirements for construction and renewals, bond sinking funds, maturing debts, and deficits in income of Puget Sound Electric Railway System in the hope that the unfavorable conditions might ultimately be improved. The directors now feel the present situation and the future prospects of these properties are so unfavorable that they are no longer justified in making further advances to assist in financing that company.

The Puget Sound Electric Railway has outstanding in the hands of the public, $2,427,000 first consolidated mortgage 5 per cent gold bonds, due Feb. 1, 1932. It also has outstanding the following securities owned by the Puget Sound Power & Light Company: $4,895,000 of income bonds; $1,116,700 preferred stock and $2,000,000 common stock. In addition, it owes the Puget Sound Power & Light Company for advances on open account $1,188,510 up to June 30, 1927.

Operation of the interurban railway between Seattle and Tacoma has from its inception been conducted in competition with a boat line. With the advent of the private automobile, earnings of the interurban railway have shown a persistent and steady decline except for a period during the war when travel was stimulated by traffic from Camp Lewis, and by extensive operation of shipyards and other war time activities. Since 1919 the business has resumed its decline, and during the four years since 1922 the company has failed to earn its total mortgage bond interest charges.

The State now has under construction a paved highway between Seattle and Tacoma, which will make available for private automobile and stage operation a route some 3½ miles shorter than the route of the Puget Sound Electric Railway. When this road is completed it seems inevitable that operation of the interurban will become even more unprofitable.

Tacoma Railway & Power Company and Pacific Traction Company have likewise suffered from automobile competition until their earnings have fallen to such a point that in 1926 the Tacoma Railway & Power Company failed to earn its bond interest charges, and the Pacific Traction Company failed to earn its operating expenses and taxes. These facts have been set forth openly without any thought of minimizing the consequences of their disclosure.

W., B. & A. Cuts Loss for Six Months

A net loss of $60,331 is reported by the Washington, Baltimore & Annapolis Railway, Baltimore, Md., for the six months ended June 30, compared with a net loss of $62,478 in the similar period last year. These earnings include only the operating results of the electric railway. The comparative statement for the six months follows:

Six Months to June 30	1927	1926
Railway operating revenues	$995,516	$984,068
Railway operating expenses	818,221	808,255
Net revenue railway operations	$177,294	$175,812
Net revenue auxiliary operations	51,364	45,314
Net operating revenue	$228,659	$221,127
Taxes assignable to railway operations	47,127	47,710
Operating income	$181,532	$173,417
Non-operating income	16,027	17,490
Gross income	$197,559	$190,907
Deductions from gross income	257,890	253,385
Net loss	$ 60,331	$ 62,478
Percentage railway operating expenses to railway operating revenues	81.18	81.13

*Deficit.

Must Remove Tracks

The Public Service Commission granted on June 1 the petition of the town of Waterloo, N. Y., and issued an order to the Geneva, Seneca Falls & Auburn Railroad, Inc., and James M. Ryan and Lansing G. Hoskins, as receivers, to remove its tracks from the south side of the highway on the north side of the river leading from Waterloo, westerly to Geneva, to the center of the new highway for about 150 ft. west of the village line, and to the north side of the highway from that point for about 1,200 ft. The cost of this work is to be paid by the town of Waterloo and repaid by the railroad company as agreed upon.

Seattle Municipal Still a Storm Center

Members of the City Council of Seattle, Wash., are trying to determine from two sets of figures that are before them the financial status of the Municipal Railway Department. From one set, that of D. W. Henderson, superintendent, it appears the railway is "doing fine" despite large expenditures. From the other set, that of City Comptroller Harry W. Carroll, the railway is still a losing proposition.

According to Mr. Henderson, gross revenues for the first six months of 1927 totaled $2,848,920, with operating expenses at $2,734,100, leaving a net income of $114,820. Moreover, Mr. Henderson's tabulation showed a gain in patronage. For the first half of the

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present year the railway carried 45,018,318 passengers, while during the first six months of 1927 the number of passengers carried was 44,987,660. According to Superintendent Henderson, the first six months of 1927 showed a net operating revenue of more than $170,000, compared with a net operating loss of $54,000 shown on the books for the first six months of 1926.

Comptroller Carroll's figures for the railway this year showed it to be now $28,000 behind in operating revenue.

Councilman Oliver T. Erickson declares the Henderson report is misleading, in that the increased number of passengers carried in 1927 means that "more deadheads and transfer passengers were carried in 1927 than in 1926." Mr. Erickson declares that the figures from Mr. Henderson's books show for the first six months of 1926 a total of 34,917,372 pay passengers compared with 34,325,259 pay passengers for the first six months of 1927, an actual loss in pay passengers. He said that the average loss in business a day since fares were raised in 1921 has been 3,137 passenger fares.

In replying to Mr. Erickson's statements, Mr. Henderson said that the increase as listed was largely in transfer passengers. He declared that the city has more buses on than before and that means more transfers.

Mayor Bertha K. Landes declares that notwithstanding a loss in pay passengers, there has been a reduction in operating expenses and a general improvement in operating methods that places the railway in a better condition than heretofore.

Common Dividend of Duluth Company Attracts Attention

According to the *Canadian Financial Post* investors in utilities are turning their attention to Duluth-Superior Traction Company, Duluth, Minn., owing to the marked improvement in the earnings position of the company for the first four months of this year, compared with the corresponding months last year. Attention was drawn to the common stock of the company by the declaration of a $1 dividend recently, and the announced intention of the directorate to maintain the stock on a $2 basis. The *Post* said:

> The board of Duluth-Superior, headed by A. E. Ames, Toronto, is conservative in the matter of dividends and it is deemed improbable that any dividend would have been declared on the common unless there was reasonable hope of continuance.

The dividend record of the common stock of Duluth-Superior has been unsatisfactory since the early stages of the world war. The normal rate of 4 per cent was reduced to 2 per cent on Jan. 2, 1915, and the payments were discontinued in July of the same year. One per cent was paid Oct. 1, 1917, Jan. 2, April 1, July 1, Oct. 1, 1918. A further 1 per cent was paid in December, 1924, but none has been paid in the last three years.

Personal Items

J. K. Buchanan Manager at Morgantown

Announcement has been made by the Monongahela West Penn Public Service Company that J. K. Buchanan, Morgantown, has been appointed general manager of the Morgantown division of the company. The West Penn only recently acquired the property at Morgantown from the West Virginia Utilities Company. It will supply the city with all its electric power and operate the local railway lines.

Mr. Buchanan succeeds R. P. Stacy, who was vice-president and general manager of the West Virginia Utilities Company. Mr. Buchanan was originally in charge of the utilities properties at Morgantown until a change of ownership a few years ago, at which time Mr. Stacy was appointed in his stead.

V. A. Hupp Made Bus Superintendent at Fairmont

Vailey A. Hupp, Fairmont, W. Va., has been named general superintendent of the bus department of the Monongahela West Penn Public Service Company, which is operated under the name of the Monongahela Transport Company. Mr. Hupp succeeds H. C. Aument, resigned. The principal bus lines of the Monongahela Transport Company extend from Fairmont to Morgantown, Fairmont to Benton's Ferry, Morgantown to Mountain Lake Park and Morgantown to Star City. They also include the Morgantown city lines.

The new superintendent probably will be located at Morgantown. He has been car foreman at Fairmont and assistant superintendent of equipment of the Monongahela West Penn, having been with the company for a period of about five years. Previous to that time he was assistant car foreman for the Baltimore & Ohio Railroad.

Messrs. Lucas and Peterman Executives of Southern Company

John Paul Lucas of Charlotte, N. C., and R. L. Peterman of Columbia, S. C., have been made vice-presidents of the Southern Public Utilities Company, Charlotte. Mr. Lucas has been connected with the Duke interests for more than eight years, concentrating especially on public relations work. In 1922 he was temporarily released in order to devote his time to a "Live-at-Home" campaign then being conducted in North Carolina. The purpose of the movement was to bring before the farmers of the state the grievous effects of failure on their part to grow at home food needed by their families and livestock. So successfully did Mr. Lucas handle the publicity for the campaign that the joint committee for agricultural work passed a resolution thanking him for his efforts.

Mr. Peterman has been connected with the General Gas & Electric Corporation and its subsidiary companies for the past twelve years. He was located at Greensboro as vice-president of the North Carolina Public Service Company, then at Spartanburg, S. C., with the South Carolina Gas & Electric Company, and at present at Columbia, S. C., where he has been connected with the Broad River Power Company.

A. J. Lundberg Succeeds L. S. Ready on Key System

Lester S. Ready has resigned as president of the Key System Transit Company, Oakland, Cal., and has been succeeded by Alfred J. Lundberg. Mr. Ready will remain with the company as vice-chairman of the board of directors.

This change in management is the latest step in the control of operation of the Key System by the San Francisco investment firm of J. Barth & Company, in which Mr. Lundberg is a partner. The new president said the move was made to keep the railway out of the hands of a receiver. On taking up the duties of his new office Mr. Lundberg said:

> Our first interest is to restore the company's credit and get its securities on a sound basis. After that has been done, we plan an extensive expansion program, which is to include an automobile ferry service from our pier.
>
> The strictest economies will be necessary at present to keep the company from going into the hands of a receiver, but with the restoration of credit, improvements in service and an active campaign for new business are planned. The company's physical assets have an actual value of $30,000,000, while the outstanding Key System securities do not exceed that amount. The company should be sound financially. It is our business to make it so and I am positive that we can do that.
>
> We realize that we must offer modern and comfortable transportation if we are to prosper. Public transportation, I believe, is at its lowest ebb at present. It is bound to improve steadily as the parking problem becomes more acute.
>
> The private automobile is our greatest competition, and in going after new business we expect to provide transportation in cleaner and more comfortable cars at a speed not so far behind the automobile. That all takes time and money and to get money we must first better the company's financial position and restore its credit.

Mr. Lundberg does not believe that there will be any further increase in fares from the present 7-cent rate, which has been in effect since 1926. The 1-cent increase granted at that time by the Railroad Commission resulted in a loss of business.

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The company's financial condition has been giving its officials grave concern. The market value of the common stock is very low, while the prior preferred, which has sold as high as $92 a share, is now quoted at $25, and preferred, which has a par value of $100 a share, recently sold for $5.50 a share. The company's refunding bonds are valued at 50 cents on the dollar.

Mr. Ready assumed the presidency on Jan. 1, having formerly been chief engineer of the State Railroad Commission.

Mr. Lundberg was elevated to the vice-presidency a little more than a month ago. In April he and Gustav Epstein, another partner of the Barth company, were elected to the directorate.

In announcing his resignation, Mr. Ready issued the following statement:

Owing to the present financial problem facing the company and the heavy obligations resting upon the firm of J. Barth & Company, owning or representing the majority stock ownership of the company, it has been considered advisable that a member of the firm should hold the position of president of the Key System Transit Company.

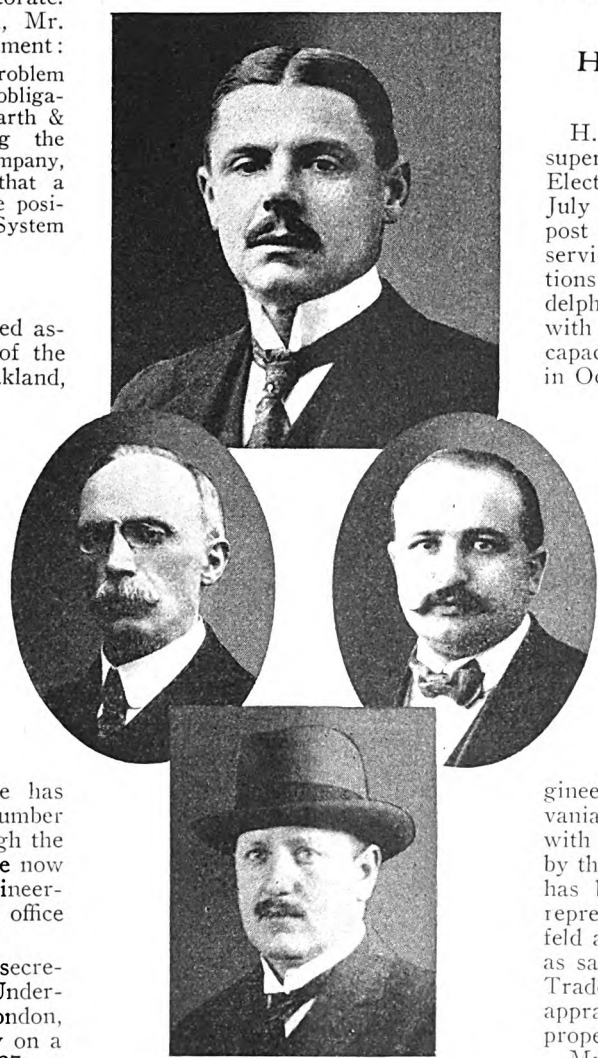
S. G. CULVER has been appointed assistant to engineering executive of the Key System Transit Company, Oakland, Cal. Mr. Culver is a University of California man and before going with the Key System was connected with several important engineering projects in the state of California. He worked on the location and construction of the Sacramento Short Line, was connected with the Railroad Commission assisting in the inventory for valuation of the San Jose Railways and for a time was with the State Highways Commission locating highways throughout the northern part of the state. He has been with the Key System for a number of years, having worked up through the various engineering offices until he now holds the post of assistant to engineering executive, the second ranking office in that department.

JAMES L. B. LINDSAY, assistant secretary and treasurer of the London Underground Electric Railways, Ltd., London, England, has been in this country on a short visit. He sailed on July 27 on his return trip.

P. H. NABORS, has been selected as assistant to W. E. Mitchell, vice-president and general manager of the Georgia Power Company. Mr. Nabors has been closely associated with Mr. Mitchell for the past two years and since 1921 has been with the Alabama Power Company. Before joining the Alabama Power Company, Mr. Nabors was with the government at the Muscle Shoals development as executive assistant to the commanding officer, and when the Alabama Power Company leased the plant he went with the company. He later was sent to Montgomery, and while there was treasurer and assistant director of the Montgomery Safety Council. When he went to Birmingham he became associated with Mr. Mitchell and for the past two years he was office and building manager of the Alabama Power Company.

Paris Metropolitan Elects New Officers

News comes from Paris of a reorganization of the operating staff of the Compagnie du Chemin de Fer Metropolitain, the company operating the subway system of Paris. Although



Marcel Ulrich, Robert Pornin, Lucien Tissier and Paul Martin

covering about 60 miles of track, partly elevated and partly subway, the company has hauled as many as 2,000,000 passengers in a day, the figure being 2,218,517 on March 31, 1927. This company is a financially prosperous one and last year paid a dividend of 14 per cent on its capital stock. Its earnings during 1926 from passengers were $12,258,878.

The reorganization followed the resignation of Mr. Lawton, formerly manager of the property. Portraits of the present four ranking officers of the company are published herewith. They are, respectively, Marcel Ulrich, managing director; Paul Martin, manager; Robert Pornin, assistant manager, and Lucien Tissier, assistant manager.

THOMAS N. MCCARTER, president of the Public Service Corporation of New Jersey, expects to sail on Aug. 6 for a six weeks trip abroad with Mrs. McCarter. He is understood to have recovered fully from the very minor injuries he received in the recent automobile accident near Media, Pa., in which the automobile driven by his chauffeur with Mr. McCarter as its occupant was involved.

H. C. Heaton Superintendent of Tracks at Providence

H. C. Heaton assumed his duties as superintendent of tracks of the United Electric Railways, Providence, R. I., on July 15. Mr. Heaton takes to his new post the experience of many years of service along engineering lines in positions of responsibility with the Philadelphia Rapid Transit Company. While with that company, he worked in many capacities up through the ranks until in October, 1923, he became head of the way department of the company. In this post he had charge of all maintenance, reconstruction and construction on about 600 miles of track embracing all types of construction and requiring the employment of some 1,200 men during the summer months.

Mr. Heaton has also had experience with manufacturing, inasmuch as before he entered the service of the Philadelphia Rapid Transit Company he served in the engineering department of the Pennsylvania Steel Company in connection with the frog and switch work done by that company. Recently Mr. Heaton has been in consulting work, at first representing McClellan & Junkersfeld as a track expert and later serving as sales representative of the Industrial Trade Corporation, which handles the appraisal and valuation of industrial properties.

Mr. Heaton was graduated from the Pennsylvania State College in Civil Engineering in the class of 1901.

J. D. Whittemore Receives New Honor

J. D. Whittemore, who recently joined the Mohawk-Hudson Power Corporation in a general engineering capacity, has been elected president of the Eastern New York Utilities Corporation, Rensselaer, N. Y. Before removing to Albany Mr. Whittemore was vice-president and general manager of the Monongahela West Penn Public Service Company.

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Manufactures and the Markets

Blanket Underwriters' Label Is Advocated

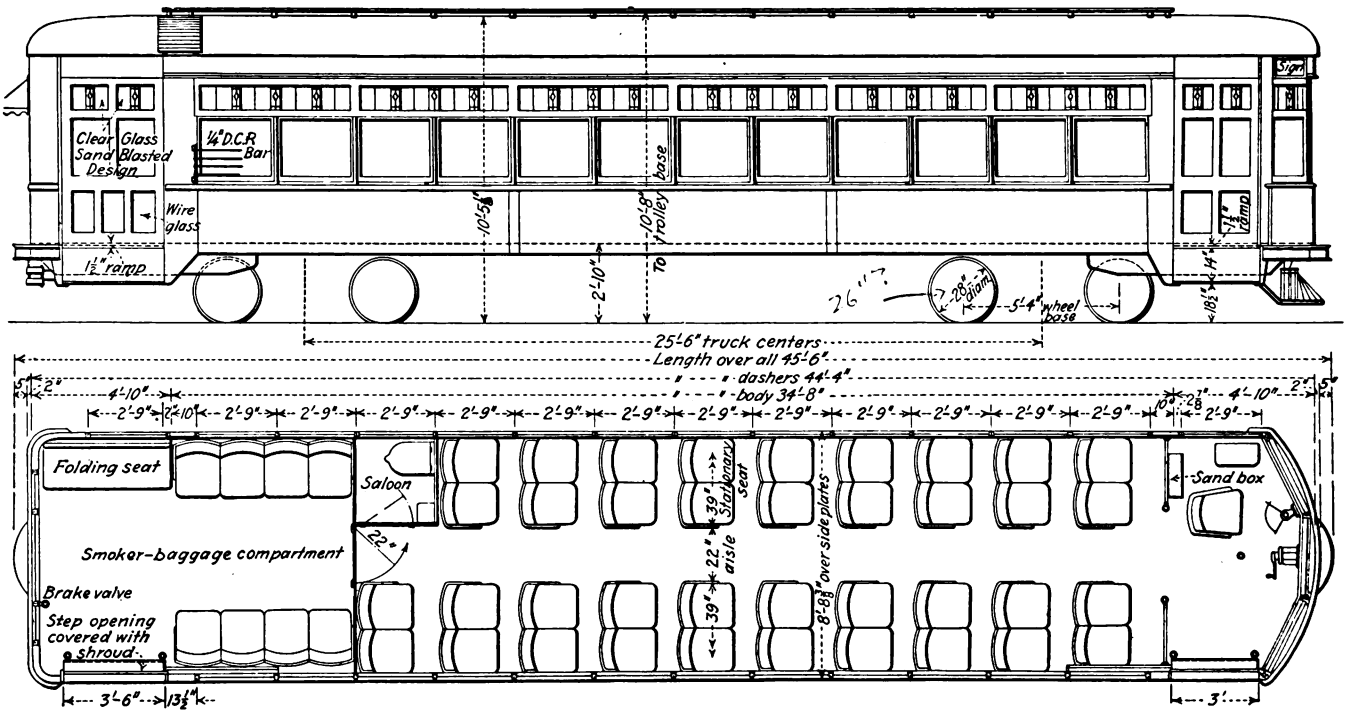
For the last year considerable interest has been shown in constructing cars that comply with the Underwriters' Department so that the finished car may have a single label showing that it has been constructed along lines described by the Underwriters' Laboratory. In order to encourage the use of approved materials as well as approved construction, the Underwriters' requirements have within recent years been changed to allow for several new types of wiring protection. Federal car manufacturers have indorsed this general idea and will build cars that do conform to the Underwriters' requirements, at no additional cost, unless the customer specifies material or construction that is not approved. A nominal inspection charge of $5 has been placed to cover the cost of construction and applying the label to the completed cars.

Reports from the Western Actuarial Bureau at Chicago indicate that the Underwriters' Laboratory's labels have been specified by the Eastern Massachusetts Street Railway on 25 cars being built for it by the Osgood-Bradley Car Company, also the 25 cars being built by the Wason Manufacturing Company of Springfield, Mass. The New York, New Haven & Hartford Railroad has also specified the labels on 50 cars each, which are being built for its Springfield and Worcester properties, half in the Wason plant and half in the Osgood-Bradley plant at Springfield. Other roads that have taken the same step are the Chicago, Aurora & Elgin Railroad, fifteen cars; the Chicago, North Shore & Milwaukee Railroad, ten cars; the Chicago, South Shore & South Bend Railroad of Michigan City, Ind., twenty cars, and the Georgia Power Company, 40 cars.

Two Steel Companies Absorbed by American Rolling Mill

The American Rolling Mill Company has acquired the property, plants, business and patents of the Columbia Steel Company and the Forged Steel Wheel Company at Butler, Pa., and Elyria, Ohio, according to G. M. Verity, president of the purchasing company. These properties add another complete manufacturing unit, from pig iron through to finished product, to Armco's producing forces. The Forged Steel Wheel Company has a capacity of some 10,000 tons per month of forged steel wheels. It makes a special grade railway car wheel. The Columbia Steel Company has worked out at Butler, Pa., a continu-

Delivery of Seven Interurban Cars to Rockford Company Imminent



Delivery is expected shortly of the seven combination passenger, smoker and baggage cars ordered March 2 by the Rockford & Interurban Railway, Rockford, Ill. As announced in the issue of the JOURNAL for Feb. 5 and Feb. 19, the units are being built by the American Car Company of St. Louis. They will operate out of Rockford on lines radiating to Beloit, Janesville, Freeport and Belvidere. With a seating capacity of 52 passengers each and of semi-steel construction, the cars are designed for a speed of 60 m.p.h.; $160,000 is being expended for the new units, some of which will be used for a door-to-door freight service.

Coincident with this order the company, it is understood, has converted two of its present interurban cars to the one-man type. Plans also call for rebuilding a third car along these lines. Subjoined are official specifications just released by the American Car Company:

Number of cars ordered	Seven
Builder of car body	American Car Company
Type	Combination passenger, smoker, baggage
Seating capacity	52
Weight, total	35,750 lb.
Bolster centers, length	25 ft. 6 in.
Length over all	45 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	10 ft. 8 in.
Body	Semi-steel
Interior trim	Agasote
Headlining	Agasote
Roof	Arch
Air brakes	General Electric, straight
Armature bearings	Ball
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Bronze, oxidized
Compressors	CP-72
Control	K-75
Couplers	American Car Company
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Gears and pinions	General Electric
Hand brakes	Brill vertical
Heater equipment	Railway Utility
Headlights	Crouse-Hinds
Journal bearings	Ball
Journal boxes	J. G. Brill Company
Lightning arresters	Aluminum
Motors	Four G. E.-247, inside hung
Sanders	Nichols-Lintern Company, No. 4
Sash fixtures	Schechter post casing
Seats	American Wicker Works
Seating material	Leather
Springs	J. G. Brill Company
Step treads	Kass safety
Trolley catchers	Ohio Brass Company
Trolley base	U.S.-20
Trolley wheels	U.S.
Trucks	Brill 177-E-1
Wheels	26-in. rolled steel

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ous strip mill to produce sheets in strip form "stripsheets" up to 36 in. in width. They employ both a hot and a cold rolled process in their plan of manufacture.

"This amalgamation brings together under the banner of Armco," says Mr. Verity, "these two outstanding developments which cover the only known means of a purely mechanical operation in the manufacture of sheet metal, either in the form of sheets or strips. This gives Armco control of at least 1,000,000 tons per year of finished product of the highest grades with which to protect the needs of its clients. The Columbia Steel Company will, for a period as yet undetermined, be operated as a separate company, but the entire product will be sold by Armco."

Work Rushed on Twenty Cars for South Shore Line

The twenty new passenger cars being built for the South Shore Line by the Pullman Car & Manufacturing Corporation are being rushed to completion to aid in providing service for the heavy summer travel on the railroad. Ten of the new cars will be motor cars and ten will be used in multiple-unit operation as trailers. Delivery of the first of the new cars is expected late next month and the others will follow as rapidly as possible.

A new feature of the interior furnishings is the new "easy chair" type of seat which has been tried on two remodeled cars now in service. Mention of this rolling stock was made in the JOURNAL for March 5.

Hannibal Car Wheel Company to Build Plant in Louisiana

The Hannibal Car Wheel & Foundry Company, Hannibal, Mo., has awarded contracts to the Austin Company, 6112 Euclid Avenue, Cleveland, Ohio, for the erection of a modern car wheel and foundry plant in Southport, La. The building will include an office structure, two stories high, 38 ft. x 38 ft. and of brick and concrete construction; a steel foundry, 200x200 ft., and a steel machine shop, 43x104 ft.

Deadlock in Labor Conference on Coal Strike

Another chapter of the labor history of 1926 was written when the district conferences looking to the settlement of the coal strike broke up in deadlock.

The prospect of a general agreement for the central competitive field was recognized, long before April 1, as practically unobtainable. The announcement of the union, however, that it would consider the district agreements opened the way for these independent district conferences. Conferences now have been held that affect directly or indirectly most of the big fields. The story of the conferences is singularly the same. The operators indicate that they cannot pay the Jacksonville scale. The union leaders say they can consider nothing less and the conference adjourns. The attitude of the other districts practically is sealed by the results of the conferences that have been held. Contrary action by Indiana or the Southwest interstate district is not expected. It is regarded as significant, however, that the overtures at these conferences come from union leaders.

In the meantime nothing has occurred to indicate a change in the feeling of consumers. Prices are weak and the heavy output of eight and one-third million tons probably is not far from meeting current requirements.

With the close of this chapter of the story none seems to be able to imagine which way the plot will turn next Barring something unexpected the industry seems to be settling into another period of waiting. It is apparent that neither side is ready as yet to meet the terms of its opponent. There appears no prospect for the early breaking of the deadlock, and even the "fading out" process predicted by some seems remote.

EXHIBITOGRAPHS—No. 1

A "COMEDY OF ERRORS" might well be applied to the artist's conception of these nemeses of A.E.R.A. exhibitors. Look to the left! Imagine the gentleman of military mien, "Cun'nel" Alexander, resting in any dugout when there are objectives uncaptured. Or that human dynamo, one "Freddie" Dell, ever squatting when there is still space to sell. Equally is the imagination stretched by the recumbent "Clint" Morgan, who when not making them sign the dotted line is flitting between Brooklyn and the Transit Commission's office.

Nearly all the prospects are vacationing. Yet

242 Exhibitors

and

113,498 Sq.Ft.

was the latest word on July 27 from A.E.R.A.'s H. Q.

They may have their eyes on the pill, that "ole swimmin' hole" or the whizzing reel, yet they haven't forgotten that

'Cleveland Is the Place to Talk Turkey

Supplies Bids for Montreal Tramways Opened

Tenders received for the supply of electrical equipment embraced in the year's construction program of the Montreal Tramways were opened July 9 by the commissioners and referred to the general manager and secretary for examination and recommendation. Firms submitting tenders were: Canadian General Electric Company, Canadian Westinghouse Company, Northern Electric Company, English Electric Company of Canada, Monarch Electric Company, Ltd., and Haliburton & White, Ltd. The tenders cover about 50 pages of items, including a new electric yard locomotive.

Track Reconstruction Ordered by St. Louis Civic Authorities

The United Railways, St. Louis, Mo., has been ordered to relocate its tracks on Kingshighway from Barnes Hospital to Manchester Avenue preparatory to the reconstruction of the thoroughfare.

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Between Barnes Hospital and Oakland Avenue the tracks will be placed in a parkway that now separates Kingshighway from a drive in Forest Park. From Oakland Avenue to Manchester Avenue Kingshighway will be widened 8 ft. on the west side and the tracks will be changed from their present position near the east curbing to the center of the widened street.

Every effort will be made to speed up this reconstruction work as Kingshighway is the main north and south thoroughfare in that vicinity and carries the heaviest automobile traffic at various periods of the day. The increase in automobile traffic during the past year forced the widening of the street and the relocation of the street car tracks.

Copper-Lead Price Still Advancing

The week ended July 27 witnessed further advances in prices for both copper and lead in the domestic markets. Copper is up ⅛ cent to 13 cents delivered in Connecticut, and the price for New York lead has advanced from 6.30 to 6.50 cents, with premiums over the price of the leading interest in evidence most of the week.

Buying has not been particularly heavy during the week, but without exception sellers are asking 13 cents, and one or two are out of the market at this level. A strong factor has been the active foreign buying. The price of the export association was advanced from 13 cents, c.i.f. on July 21 to 13.15 cents, and on Monday, July 25, a further advance to 13.25 was made. This was after the domestic market had been pretty well established at 13 cents in the valley. The effect was to dull the appetite of foreign buyers for the time being, but sales for the month of July will total close to 60,000 tons, or nearly as much as in the excellent month of May. The American Brass Company has made another advance in the prices of its products, this being the second within ten days. The basis is now a 13-cent copper market.

On July 21 and 22 and the following Monday lead sellers were swamped with inquiries. The man who asked for 1,000 tons had to be content with 100 or 200, and smaller inquiries were pared in proportion. The American Smelting & Refining Company, faced with premium business in the outside market, raised its official contract price for New York lead twice: from 6.30 cents to 6.40 cents on July 21 and to 6.50 cents on July 22. The leading interest in the West raised its price to regular customers to 6.30 cents on July 22 and since then has been willing to take attractive business at 6.325 cents. Fancy prices ranging up to 6.45 cents in St. Louis and to 6.70 cents in New York were obtained during the early part of the week.

Zinc prices have fluctuated within narrow limits, with the volume of business up to normal. Brass special grades have been particularly active, although the premium has usually been closer to 2½ points than to 5. The statistical position of the metal is improving.

Consumers in the domestic market showed little interest in tin last week. Prices for Straits are slightly easier than a week ago, and spot, prompt, August and September deliveries can be had at the same prices. Tin of 99 per cent grade is in a little better position than Straits. In London there is a backwardation of nearly £6 per ton.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINING

Metals—New York	July 26, 1927
Copper, electrolytic, cents per lb.	12.79
Copper wire, cents per lb.	14.75
Lead, cents per lb.	6.55
Zinc, cents per lb.	6.34
Tin, Straits, cents per lb.	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.025
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings. Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.90
White lead in oil (100-lb. keg), N. Y., cents per lb	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.62

† Quotations withdrawn on account of strike.

ROLLING STOCK

Alabama Power Company is planning to add two large new cars to the service on its railway system in Gadsden, Ala. They will be modern, low-bodied, low-wheeled, high-speed cars. They will be lighter than the cars now in use, but will have larger seating capacity and much higher speed.

Worcester Consolidated Street Railway, Worcester, Mass., has received five 29-passenger buses from the Fageol Bus Company of Detroit, estimated to cost $45,000.

International Bus Corporation, a subsidiary of the International Railway, Buffalo, has received ten gas-electric and fourteen gasoline motor buses for operation on its local bus lines. They are all of the single-deck type, equipped with pneumatic tires, with dual tires on the rear wheels. These buses are similar to those used by the company on the Delevan Avenue and the Kenmore-Tonawanda routes and they bring the total bus equipment of the International up to 85 vehicles, of which 49 are of the gas-electric type developed by Mitten Management, Inc., for service in Buffalo and Philadelphia.

TRACK AND LINE

Worcester Consolidated Street Railway, Worcester, Mass., has begun laying new rails in June Street from Newton Square to the end of the line. In order to avoid an interruption of traffic a bus is giving service from Newton Square to the terminus, transferring at the square. Reconstruction work involving an expenditure of $21,000 is also under way on the company's other lines. Work has been started on the Barbers Crossing line, where 700 ft. of new track is being laid on Burncoat Street. A motor coach is transporting passengers over the areas under construction. Extensive improvements are also under way on the Providence Street line, where 3,300 ft. of new track is to be laid. Motor coaches are also giving service at this point.

Southern Indiana Gas & Electric Company, Evansville, Ind., plans to spend $575,000 on railway service and in other departments during the present year. New tracks already have been laid on West Franklin Street and Barker Avenue and the Bellemeade Avenue line is now being double-tracked at a cost of more than $40,000. New tracks are to be laid on other streets as they are improved by the city.

TRADE NOTES

Railway Utility Company, Chicago, Ill., has moved to larger quarters at 2241-47 Indiana Avenue.

Walter Jackson, bus and fare consultant, has moved his Mount Vernon, N. Y., headquarters from 143 Crary Avenue to 160 Gramatan Avenue.

National Machinery Company, Tiffin, Ohio, and the Chambersburg Engineering Company, Chambersburg, Pa., announce a combination of their sales forces. Sales offices will be maintained in Tiffin, Chambersburg, New York City, Chicago and Detroit.

J. G. Brill Company announces that William M. Horsell, sales representative in the central states covered by the G. C. Kuhlman Car Company, has been transferred to its Philadelphia plant to represent the company's electric railway division in the Southeastern territory, including the states of Virginia, North Carolina, South Carolina, Georgia and Florida. Mr. Horsell has been with the Brill organization in its Kuhlman plant since 1920.

ADVERTISING LITERATURE

R. H. Beaumont Company, Philadelphia, Pa., has prepared catalog No. 95 on the Beaumont cable drag scraper.

General Electric Company, Schenectady, N. Y., has distributed an interesting booklet on automatic generator voltage regulators.

Ohio Brass Company, Mansfield, Ohio, has mailed a circular describing its modern trolley base.

Wagner Electric Corporation, St. Louis, Mo., has sent out looseleaf bulletins Nos. 149 and 150, describing two types of repulsion induction motors.

Goodell-Pratt Company, Greenfield, Mass., has recently distributed a catalog covering its electric drills. It is the company's first catalog.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, August 6, 1927 *Number 6*

Purchase of Power Again Indorsed

SIGNIFICANT, indeed, was the signing last week of a twenty-year contract between the Pennsylvania Railroad and the Philadelphia Electric Company whereby the latter will furnish energy for all of the railroad's present and future electrification projects in that district. The advantages and economies of buying energy for electrified railroads have been emphasized frequently by the light and power utilities. The railroads, however, have been cautious in following this advice. They have felt that it placed their motive power outside their own control, and in general they have preferred to remain wholly self-contained. Naturally this feeling has been more marked in the trunk line railroads than in the local electric railways. Many of the latter are closely affiliated with the light and power companies and they have not hesitated to depend on purchased energy. Indications are that the tide is now turning also in the trunk line railroad field. Electrification of the Illinois Central in Chicago was based on purchased energy. The influence of the action of a conservative railroad like the Pennsylvania in making a long-term contract for the purchase of energy will be felt strongly. These evidences that the railroads are looking with more favor on the policy long urged by the light and power utilities should spur the latter to give their best service and lend all possible encouragement to electrification projects.

Key System Officials Have Right Attitude

AFFAIRS have not been going well with the Key System Transit Company, Oakland, Cal. It is apparent that the increase in rates put into effect some time ago more than offsets the reduction in the use of transportation, but it failed to result in the increase in revenue estimated at the time of the hearing before the Railroad Commission. During the year the increase in wages under the labor award made effective Jan. 1, 1926, was $400,000. New work completed for the three years cost $2,566,752. In addition $4,335,870 of work remained uncompleted at the end of 1926, making the total net addition for the three years $6,380,276. During 1926 forty one-man, two-man cars were purchased and put into service. The detailed statistics of operation afford an interesting commentary on the affairs of the company.

Officials have been very frank in putting their cards on the table. Their announced intention is first to restore the company's credit and get its securities on a sound basis. After that has been done the management plans an extensive expansion program which is to include an automobile ferry service from its pier. It is going after new business, and in doing that it expects to provide service at a speed not far behind the automobile. The problem before the company is certainly a serious one, but the territory in which the railway operates is growing rapidly, the relations of the company with the public have been improved immensely and a management is in the saddle that appears to sense adequately the magnitude of the problem that is before it, but does not quail before that problem. Nothing would be gained at this time by calling the attention of the industry to the matter, if it were not for the fact that the disposition of the management carries its own message of confidence on the part of the present owners in their own property and in the essentiality of electric railway and bus service to the wellbeing of the communities which the system serves.

Southern Association Attracting Wide Attention

MORE than passing interest attaches to the large attendance and the wide representation at the recent meeting in Atlanta of the Electric Railway Association of Equipment Men, Southern Properties, a report of which is published elsewhere in this issue. Both maintenance men and operating executives were attracted from many properties outside the Southern territory. At the meeting they expressed themselves as heartily in accord with the work being done and signified their desire to co-operate and participate in this work.

What, then, is this active association doing which should be given attention by the rest of the industry? In the first place this is a working association; that is to say, the idea in the minds of its organizers was to arrange a medium through which equipment maintenance men might get together periodically for a comparison of their experiences and practices. The manufacturer is welcomed, but it is the general understanding that he may hear his product frankly criticised in "open meeting." To be sure, such criticism may be unfair. The conditions under which the product was used may have been entirely unsuitable, or the operator may have been hasty in his condemnation without knowing all the facts. Nevertheless, it is the object of this association to encourage the voicing of experiences and opinions fully and frankly. Therein lies one of its greatest sources of value. Each man is free to take the others' opinions for what they are worth. Only when the discussion is frank and open is the desired result obtained.

There is another phase of this association's work that is worthy of particular attention. That is the interchange of records of pull-ins and maintenance costs between the member properties. There is much less working in the dark than formerly. Figures that were at one time closely and jealously guarded are now openly interchanged and published. The result has been good for all concerned. The records have consistently improved and the costs have decreased. The effect on each participating property has been to stimulate a spirit of friendly rivalry which has brought about improvement in performance and at the same time has brought the work of the maintenance departments to the attention of the operating executives.

The results accomplished have attracted the attention

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of properties outside the confines of the Southern territory in which this association was originally organized. New members have come in to participate in the good work which is being carried on. There is some danger that the rapid growth in membership may curtail in some respects the informality and free expression of opinion which has given to these meetings one of their greatest sources of value. But there is no question that the good work being done should be extended to other territories. One method would be to apply the idea of interchange of records as one of the phases of every sectional association's activity. A similar plan might also be profitably applied by the maintenance of way and distribution departments.

How Much Longer Can New York Afford to Pay the Price?

ANOTHER step has been taken in the establishment of the much discussed and debated New York bus service by the award of franchises by the Board of Estimate to the Equitable Coach Company for operations in Manhattan, Queens and Brooklyn to the Surface Transportation Corporation, a subsidiary of the Third Avenue Railway, for operation in the Bronx and to the Tompkins Bus Company for operation in the Borough of Richmond on Staten Island. This latter operation has already been started as an emergency measure due to the discontinuance of service by the municipal trolleys on the island when power was cut off the lines for non-payment of bills.

Just why the awards of franchises have been made in the manner finally decided upon is, of course, a complicated matter and one of expediency in which all the cross currents and motives are difficult to trace clearly. This applies particularly in the case of the Manhattan and Brooklyn franchises, for which the Fifth Avenue Coach Company and the Coney Island & Gravesend Bus Corporation, fostered by the Brooklyn City Railroad and the Brooklyn-Manhattan Transit Corporation, respectively, were active contenders. The former had gone to the extent of purchasing the New York Railways in order to remove from the field as a contender or objector an existing transportation company to which the proposed lines would in many instances be a competitor.

There is ample evidence that the much discussed bus question in New York is still far from being finally settled. In the first place certificates of convenience and necessity must be issued before the right to operate the proposed lines is fully confirmed. But in addition to that there looms the likelihood of court action by existing transportation companies to keep the Equitable out of Manhattan and Brooklyn.

It is quite evident that New York has again taken a step away from unification of its transportation facilities rather than toward that end. It is also quite evident that, regardless of who the final operators are, bus service in New York will be limited to the kind of service that can be rendered for a 5-cent fare. Of course this is not the 5-cent fare of which the politicians have made so much capital. The name is retained, but that is all. Five cents is the unit of fare, but there is no more similarity between what can be purchased for this 5 cents in the way of a bus ride and the universal city-wide transportation service that is given for 7 cents on the street cars of a city like Chicago, for example, than there is between a ticket to a side show and an admission to the "big top" of a circus. Furthermore, New York is committed to the kind of bus service that can be operated for 5 cents, just as it is committed to the kind of surface car service and rapid transit service that can be rendered for that rate of fare. New York insists upon having "cheap" transportation. It is a source of considerable interest to speculate on the question of just how long the American metropolis can afford to pay the price in inconvenience and discomfort.

The Double-Deck Car Again

IN LAST week's issue of the ELECTRIC RAILWAY JOURNAL a British engineer pointed out that double-deck cars are used almost exclusively in his country and urges their employment in the United States. This is done despite the fact that at one time double-deck cars were quite common on the continent of Europe, but have since been abandoned, leaving Great Britain and its South African colonies as their only present users. He says that the principal argument brought against them in the United States is that they are likely to be slower in operation, but he thinks this is erroneous. The average speed of double-deck cars in Great Britain, he says, compares favorably with that of single-deck cars in the United States and in continental Europe. He cites the speed of the London County Council cars to this effect. He then points out some undeniable advantages in double-deck cars, such as economy of street space occupied and of car weight per passenger seat.

But there are several reasons favoring the use of double-deck cars in Great Britain which do not apply in the United States. In the first place the Englishman is very fond of his pipe, and as smoking is permitted on the upper deck it is a popular place with smokers. Because of this smoking rule the windows on the upper deck (when inclosed) are generally kept open. This is no hardship in Great Britain even in winter, because the winters are mild. To make an upper deck comfortable in winter in most American cities north of the Mason-Dixon line would require that it be heated and the windows generally kept closed. Some British cars are operated without an inclosure for the upper deck. Such construction, of course, would hardly be practicable in America.

While the average schedule speed mentioned in the article for London (9.6 m.p.h.) compares favorably with average city speeds in America, there are certain reasons for the good record of the London cars. One is that no platform doors are used. Fares are collected while cars are moving. Stopping time is shortened due to passengers getting on and off cars while they are in motion. The location of stops for the London County Council conditions is given as 240 yd. apart, or 7⅓ to the mile. There is some question, however, as to whether the actual stops for the interchange of passengers are not considerably below this, and consequently below the requirements in those American cities with which the author makes schedule speed comparisons.

There is a serious need for specific data regarding the stopping time of double-deck vehicles, both cars and buses. Unfortunately, in all discussions of the double-deck vehicle there is a notable lack of definite information regarding the actual loading and unloading time per passenger and the actual number of stops made for a given schedule. Without such data most discussions of this kind degenerate into a mere exchange of opinion, rather than an analysis of facts.

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But slowness is not the only objection to the double-decker. American operators fear the possibility of accidents on the stairs, particularly with the high rates of acceleration and braking that must be used to maintain schedules under American congested street conditions. After many years of experience with court decisions on liability for accidents, American operators are shy regarding any feature which seems to offer an increase in the accident hazard.

The suggested double-deck car has an over-all length of 34 ft. with 70 seats and a standing capacity of 36, making a total passenger capacity of 106. This is not a material improvement over present American single-deck cars such as are used in large cities. The double-deck design, to be sure, affords some increase in seating capacity, but its total capacity is no greater than the large American single-deck car. In addition, the reduced headroom for double-deck design materially decreases the comfort for standees. A standing capacity of 36 in a double-deck car of the design suggested is materially above the standard permitted in London. On American double-deck buses the general rule is to permit no standees, or at most a very limited number, on the lower deck.

From the standpoint of operating economy, the double-decker offers no material advantage. It is inherently a two-man vehicle, particularly when carrying the loads suggested in the article. There would be no saving in employees on this 106-passenger double-deck car over two single-deck one-man cars of the same aggregate capacity. On the other hand, the single one-man units would give fewer and shorter stops, better schedule speeds and greater frequency of service for the same labor cost. There are very few situations in which the reduction in length due to double-deck design would offer a material advantage. Situations in which track capacity has actually become a limiting factor in carrying the loads encountered are very rare. This subject has been given greater prominence in discussions than is warranted by actual operating experience.

Don't Forget the Claim and Accounting Departments

FOR a number of years there has been a feeling among both claims men and accountants that the work of their respective associations, which offers much of value to the individual property through comparison of practices and development of better principles of organization and procedure, has been seriously handicapped by inadequate attendance at their annual conventions. At that time the work throughout the year of both these affiliated associations is brought to a head. Committees which have devoted themselves diligently to surveys of practices on many properties, and to the study of current problems facing these two important departments, report and discuss their findings. An individual claim agent or accountant can derive much of value to his own job. This is particularly true of those who have not had the opportunity of participating during the year in association and committee work.

There seems ample reason for the impression that there is a tendency on the part of executives to leave the claims man and the accountant at home when convention time comes. There may also be reason for questioning the extent to which some of those who do attend take part in the proceedings of their particular association. The subject is properly one to which this year's officers, both in the Claims Association and in the Accountants' Association, have given careful thought. They have gone further than that and have rightly asked the co-operation of the American Association officers in enlisting the interest of executives in the importance of the affiliated association programs.

Surely the subject is one that deserves the careful consideration of every forward-looking executive who is making plans for this year's convention. Don't forget the company's medical department. The Claims Association has given particular attention in its program to subjects in which the company doctor is vitally interested.

Art and the Street Car

NEVER, perhaps, was the boast "I'm from Missouri, you'll hafta show me" answered in a more satisfactory way than when the Kansas City Public Service Company adopted a color scheme for its cars as submitted by the Municipal Art Commission.

Paradoxically in being "shown," the Kansas company has shown the electric railway industry the logic of consulting civic and artistic agencies in the matter of selling transportation.

Had such a course been followed or suggested a few years ago the proponents would have been made the butt of every paragrapher and cartoonist throughout the nation.

Art and the street car! From the reactionist's standpoint, this association would be as comparable as ambrosia and sphagetti. But, thank goodness, most of this destructive type of thinking has vanished from the industry. Gradually artistic ideas have been recognized to play a part in the development of commerce, transportation, machinery and all the other "low brow" things that are inseparably bound up in the life of the average citizen.

Color technique, contour and the necessity for the main subject to have an esthetic background are no longer cloistered in the strict realm of art. Modern artists do not wish it so. They have sought an opening in business, but have been repelled up to a decade ago. They have proposed, but hidebound prejudice has disposed. Ignorance and the opinion that a group or groups of men can plumb the tastes of millions have been responsible for the millions of architectural and other abortions that nauseate the body politic of this country.

But back to art and the street car. Is there any more reason for the affinity of artistic ideas with steel and brick than there is for these ideas to go hand in hand with the moving servant of the public that speeds communication, binds city to city, makes a city into a neighborhood, annihilates space, overcomes inertia, rests the weary and performs a thousand and one other commissions of mercy and commerce?

The great mistake has been that some men have never been able to realize that the perfectly fitted gear, the humming motor, are as much the expression of art as is the portico of a Greek temple. If this be so, then why should not art control the color and form of cars? Imagine the revulsion which would result from an ugly picture being paraded before our eyes through miles of city streets day in and day out. Apply this to the street car, which is the picture of transportation and the symbol of civic service, and one then realizes the tremendous importance of the step taken by the Kansas utility. Art and the street car! May they never be henceforth divorced!

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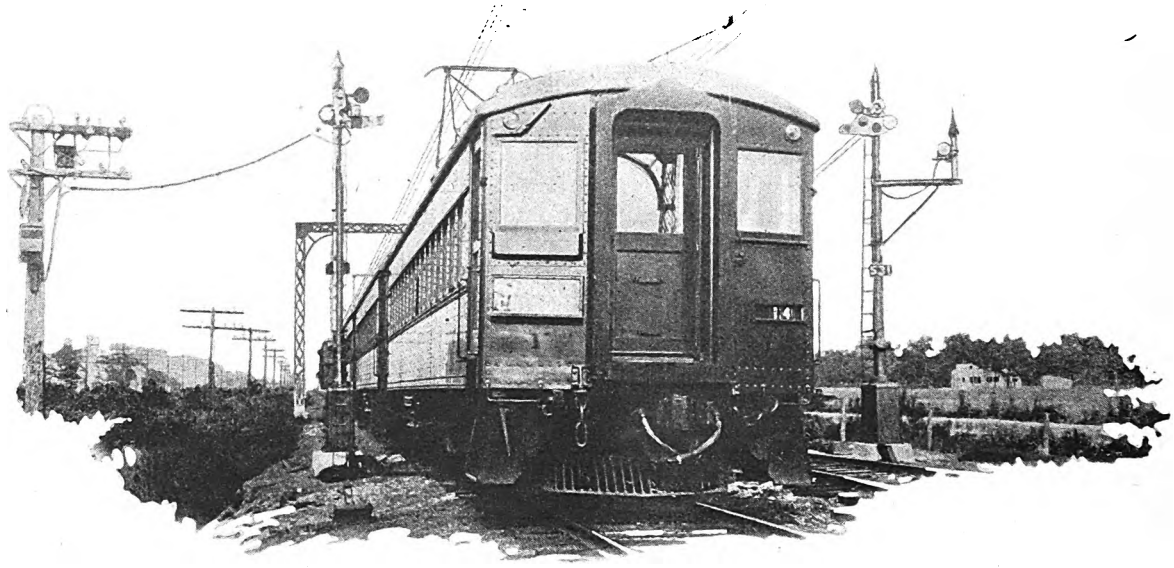
South Shore Line Rehabilitated

Through electric service now provided by the Chicago, South Shore & South Bend Railway between Chicago and South Bend through an operating agreement with the Illinois Central— Details of car equipment are given



A multiple-unit steel train on the South Shore Line. The type of block signals is also shown

REHABILITATION of the Chicago, South Shore & South Bend Railway entailed large expenditures for permanent way, grade separation, line reconstruction, new substations, new passenger rolling stock and locomotives. Adding to these features the introduction of more luxurious traveling accommodations, the system is representative of the most thorough and progressive methods of electric interurban railway operation.

The South Shore Line extends between South Bend, Ind., and Chicago, Ill., a distance of approximately 90 miles. It was originally electrified in 1908 with a 6,600-volt, single-phase a.c. contact line. The greatest step in advance since the South Shore Line was built was made late in August, 1926, when through electrically operated service between downtown Chicago and downtown South Bend was established and fast limited trains were operated hourly during the day out of each terminal instead of every two hours. The running time between terminals was decreased twenty minutes. Improvements were made possible by the new passenger equipment and the electrification of the Illinois Central suburban service, the tracks of which are used by the South Shore Line trains from Kensington (115th Street) to Randolph Street and Michigan Avenue, Chicago. Formerly South Shore Line crews left the trains at Kensington, a steam engine was coupled onto the trailers and Illinois Central crews took them to the Randolph Street terminal. The through operation makes possible a saving in time, does away with the inconvenience of two ticket collections and puts the responsibility for courtesy and service solely upon the South Shore Line trainmen.

Under the new schedule 60 trains are operated daily, of which 37 run limited between terminals and the balance provide local and express service. A fast train now leaves Chicago every hour, on the hour, between 5 a.m. and 11 p.m., with similar service in the opposite direction.

The beautiful Dunes region, at the southern end of Lake Michigan, is becoming more and more a summer playground and the South Shore Line is the only railroad reaching the region. The State of Indiana has acquired thousands of acres of this virgin land, unexcelled for beauty in the Middle West, for a state park. A hotel, amusement pier and other buildings are to be erected at the center of the area next summer by the state for the accommodation of visitors. Hudson Lake, in northern Indiana, surrounded by wooded tracts, is also served by the South Shore Line and various picnic parties, ranging from 50 up to 2,000 persons, have used special trains from Chicago for outings at this point.

New Rolling Stock Added

It is the expressed aim of the management to make the South Shore Line equal to any high-speed electric railroad in the country. To this end in slightly over a year more than $3,000,000 has been spent by the management for new passenger and freight equipment, new rails, rock ballast, station improvements and the conversion of the entire line from a.c. to d.c. Eight new substations, four with rotary converters and four with mercury-arc rectifiers, now supply the power.

Trains of from two to eight cars will be made up with normal units of one motor car and one trail car.

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A different combination of cars may be arranged if desired, and inclusion of dining and observation cars in special trains is provided for.

At the start 30 motor cars and 32 trail cars, including observation and dining cars, were bought. Each motor car, with equipment, weighs approximately 130,000 lb. and will seat 56 passengers comfortably. Each trail car weighs approximately 75,000 lb. and has the same seating accommodations as a motor car.

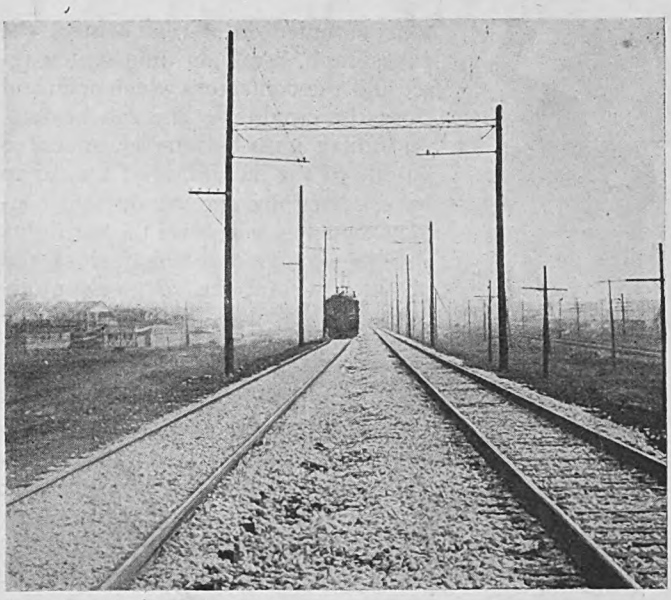
The electrical equipment of each motor car consists of four Westinghouse type 567-C-9, 750-1,500-volt d.c. traction motors controlled by Westinghouse type HBF electro-pneumatic unit switch control, working on a 32-volt auxiliary circuit. The control layout eliminates all direct connections between the main high-tension circuits and the master control circuits, the 32-volt d.c. supply for lighting and control being obtained from a motor-generator set and battery.

The control is non-automatic and consequently provides for a large variation in train make-up, together with the simplest arrangement of unit switch grouping. All master control circuits are operated from the 32-volt circuit.

Current collection is provided for by a spring-raised, air-lowered double-shoe pantograph. One trolley base with pole and sliding shoe is also mounted on each motor car for auxiliary or emergency use. Lightning protection is obtained by a type AR electrolytic arrester located on the car roof.

The line switch contains two unit switches connected in series which open simultaneously in case of overload, as well as when the master controller is returned to the "off" position. These switches are identical with those in the switch group and the box for housing them is the same.

The switch group contains eleven unit switches and a motor cutout switch. The box inclosing the group is made of structural steel members with sheet steel sides. There is no top terminal compartment. The main leads are brought directly from the various switch units through a bushing near the top of the group. Bolted connectors on these leads connect them to the cables from the car body.



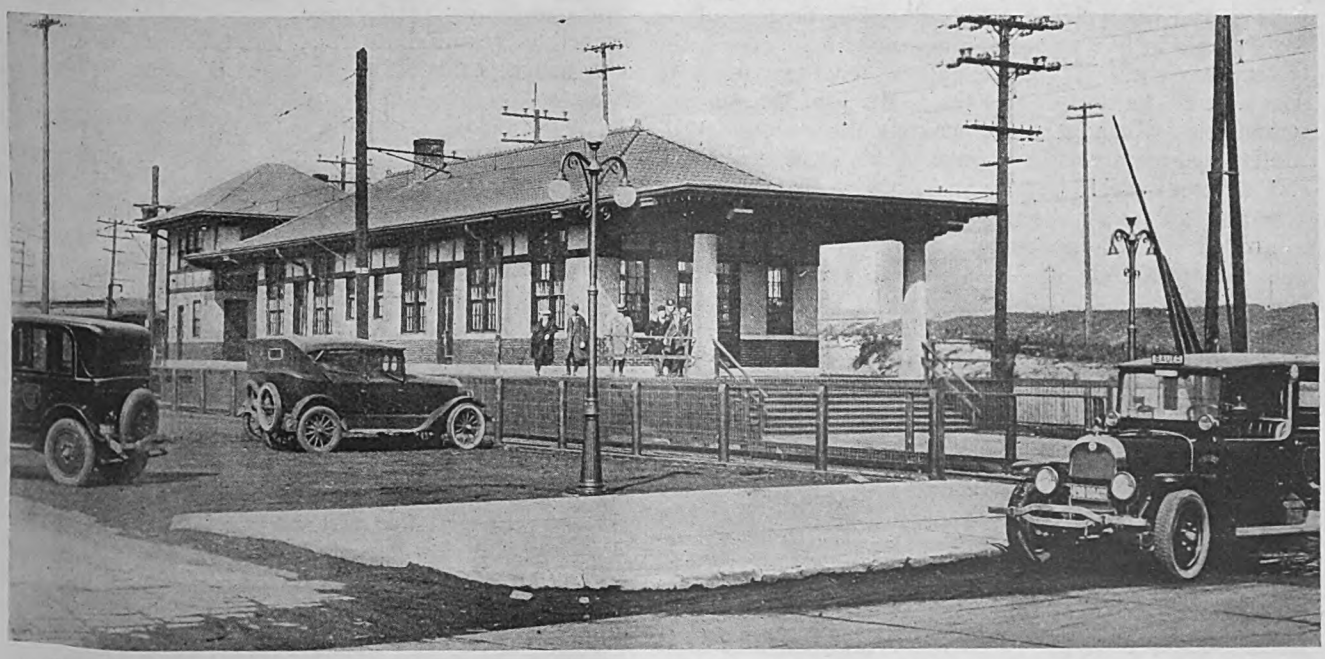
South Shore right-of-way near Hammond, Ind. New stone ballast, 100-lb. rail, catenary overhead and steel truss supports have been installed

In one end of the switch group is the motor cutout switch, which is of the knife-blade type and cuts out the motors in pairs. The switch group measures 59 in. x 18 in. x 25 in. and weighs approximately 1,100 lb.

The drum type reverser is operated by an electro-pneumatically controlled air engine. It is inclosed and mounted separately. A large margin of capacity has been provided by an improved type of finger, the pressure of which is maintained over a considerable deflection by a strap of spring steel.

A type XM master controller is located at each end of every car, both motor and trailer, in order to obtain a maximum of flexibility in train assembly. It is similar to those used extensively on the Chicago elevated lines. The controller has ten notches, five series and five multiple, the last multiple position giving the short field connection on the motors.

All of the control switches operated by the motorman are mounted in a single push-button set. Twelve but-



The island type passenger station at Gary, Ind., was remodeled, the dispatcher's tower and train room at the rear being new

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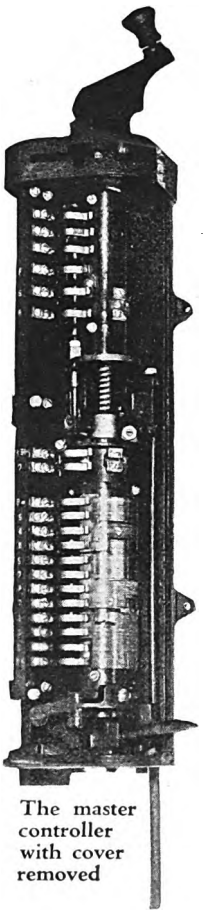


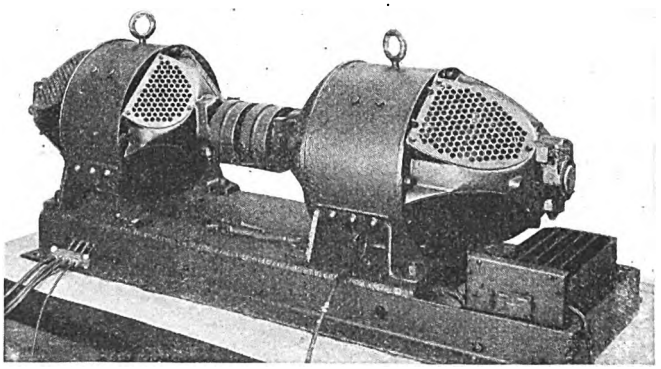
The master controller with cover removed

tons mounted in a row control the pantograph, headlight, line switch reset and the contactors which open and close the circuits to the cab heaters. A similar push-button set, mounted on one of the bulkheads of the car to be operated by the conductor, contains switches to control the car lights and the contactors which close the car heating and the compressor circuits. This does away with the necessity of the train crew handling any 1,500-volt apparatus or switches. The magnetic contactors for the 1,500-volt supply to the motor-generator set, compressor and heater circuits are mounted together in a box attached to the car underframe.

Control circuits will be carried between cars in two separate train lines, keeping any one jumper down to a size easy to handle. One train line will carry all the circuits necessary for the main motor control. The other train line carries wires for the pantograph control and also the generator and battery positive and negative wires. There is also a 1,500-volt bus line which feeds the auxiliary 1,500-volt circuits on the trail cars. The 1,500-volt bus line receptacles are protected by contactors which are opened by switches on the angle cock of the air brake lines.

Each motor car and each trail car is equipped with a 2½-kw., 1,500-32-volt motor-generator set, designed to give, in conjunction with a battery, a close regulation on the generator without external regulating devices, even though large fluctuations occur in line voltage. Both motor and generator are compound wound. The motor is primarily a series machine, with sufficient shunt field to prevent dangerous overspeeds at light loads. The generator has a shunt field to provide the normal 32 volts at full line voltage, while the series field regulates for changes in line voltage. This series field carries the battery current. If voltage on the generator tends to decrease, the battery discharges to the load through the series field, which in turn increases the generator excitation and maintains its voltage. This same series field acts differentially to prevent the battery from charging at too high a rate. The motor-generator set is normally controlled through an ampere-hour meter which shuts it down when the battery is fully charged and starts it up when the battery has been 15 per cent discharged.

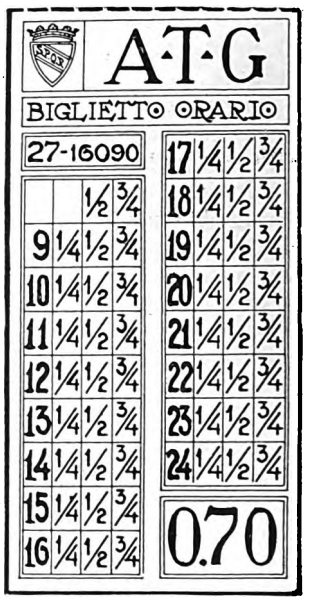
In addition to being controlled by an ampere-hour meter, the motor-generator set is also started up automatically whenever the main car lights are turned on. This insures, at all times, a voltage close to normal for the car lights and also keeps a good reserve charge in the battery.



Control motor-generator set ready for mounting

Rome Adopts Universal Transfer

ALTHOUGH most of the Italian tramways charge a flat fare within city limits, transfers are a rarity. Instead, the systems have a very large number of routes so that a passenger, by waiting a short time, can usually find a car passing the point at which he is waiting to take him to his desired destination. Within the last few months, however, the management of the Rome Tramways decided to adopt a universal transfer system. It finally selected the form illustrated, which is notable because of the absence of the designation of any transfer or terminal points. It is simply a "pass," good on any line for one hour from the time of its issue. This interval was taken as approximately that required to make a continuous journey from any point to any other point on the system. If more time is taken, even if caused by car delays, the passenger must pay another fare, because the ticket is not valid for a point-to-point ride. It is simply a pass, good for one hour. Only one punch is required, that of the time of issue. When the punch is made the passenger is given the benefit of fractions of one-quarter of an hour.



Rome adopts as transfer a pass good for one hour

In the ticket shown the hours begin at 8:30 a.m. and are carried up to 12:45 a.m. This is because a workmen's reduced fare is charged between 5:45 a.m. and 8:30 a.m. and higher "owl" fares are charged in the early morning. A similar ticket to that reproduced but with different numerals is sold during workmen's hours.

The ticket shown is sold for 20 centesimi (about 1 cent) more than the ordinary flat fare of 2½ cents. The early morning hourly pass is sold for ½ cent more than the workmen's flat fare of 1¼ cents. There is, of course, some chance that a traveler will double back on the ticket shown, if he can make both trips within an hour, but the Rome management believes the extent of such use of the ticket will be slight and its dangers do not outweigh the advantages of having as simple a universal transfer as that shown.

To the standard flat rate of 2½ cents, mentioned above, the Rome system adds a ½-cent supplement on Sundays, making the fare 3 cents, and turns over the extra receipts to the city's anti-tuberculosis fund. Its night fare is 70 centesimi, or 3½ cents.

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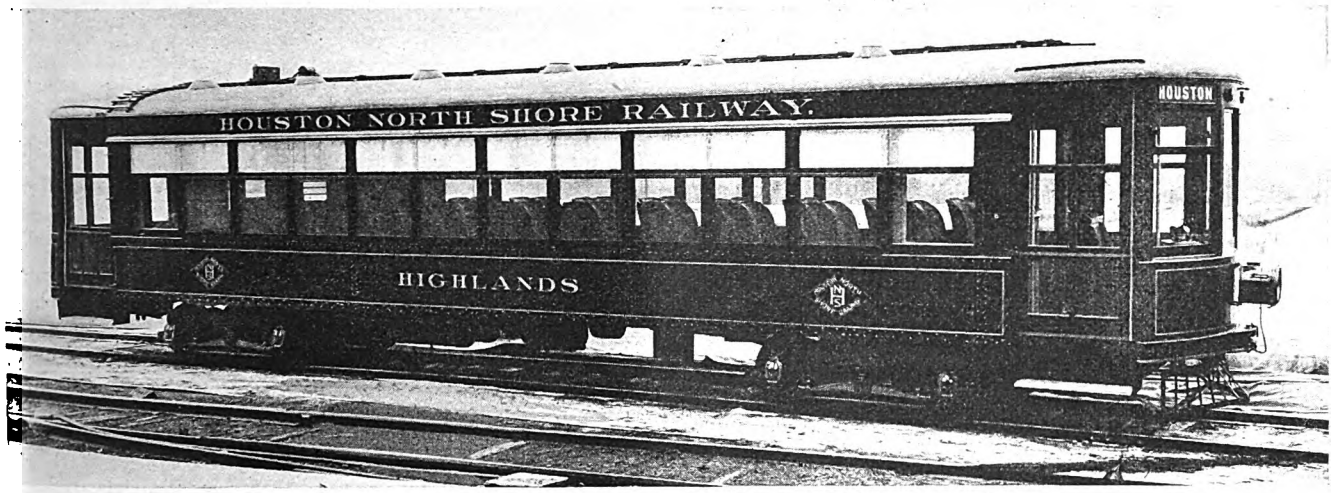
De Luxe

Interurban Cars Placed in Service

by the Houston North Shore Railway

Texas company competes for traffic with light-weight one-man cars of attractive appearance and unusual interior appointments



Four of these light-weight de luxe one-man cars are now serving interurban passengers of the Houston North Shore. Careful attention was given to the lines of the body and roof

PATRONS of the Houston North Shore Railway, which operates between Houston, Harrisburg, Lynchburg, Goose Creek, Seabrook and Texas City, Tex., are admiring the company's new rolling stock —four 44-ft. 4-in. single-end, double-truck, combination de luxe passenger smoking and baggage cars. These cars, which were delivered recently by the American Car Company of St. Louis, represent a skillful combination of streamline design with luxurious appointments intended to offer an attractive appeal to passengers.

Several novel features have resulted from the effort which was made to build a car that would be attractive to passengers. Considerable attention was given to the exterior lines and the general proportions of the car. It was the desire here to eliminate awkward angles and curves and to produce a general "racy" effect to give the impression of gracefulness and speed. The roof curve is very low. This, it was felt, tends to eliminate the topheavy appearance produced by a high arch.

From the front end the appearance is quite conventional. At the rear end, however, advantage is taken of the single-end operation to work out an observation effect for the combination smoking and baggage compartment. The general result from the exterior more nearly approximates in appearance a de luxe intercity bus than the conventional interurban car.

Several striking things have been done on the interior. The customary practice of using natural wood finish has been abandoned entirely and the interior woodwork is painted in shades of gray and green with panel striping very similar to that used in the latest types of Pullman and steam road parlor cars. Although there are only four of these cars a different color combination is used for each, and in each case colors of seats, floor covering and interior paint are selected to form a harmonious combination.

Two things are accomplished by this plan of varying the interior color scheme of each car. Its very novelty is expected to attract the attention of passengers to the luxurious facilities provided. Furthermore, by thus having each car different it was felt that the monotony of riding constantly in vehicles of one color would be relieved and that the attractiveness of pleasant surroundings would help to win automobile drivers to the railway.

Near the rear end of the body a stationary steel partition located at the fourth window post from the rear divides the main passenger section from a combination baggage and smoking compartment that is equipped with two-passenger cross-type seats, well padded and upholstered in leather of the same quality as that used on the seats in the main passenger section, and a folding slat seat. In front of the two cross-seats there are folding tables.

The smoking compartment partition is provided with a 22-in. door of wood fitted with one glazed sash. A toilet room occupying the space of one window section has been provided in the passenger section, on the left-hand side of the car and adjacent to the partition. This toilet room is built of steel with a solid panelwood door. The bus pattern rear vestibules are fitted with three sash,

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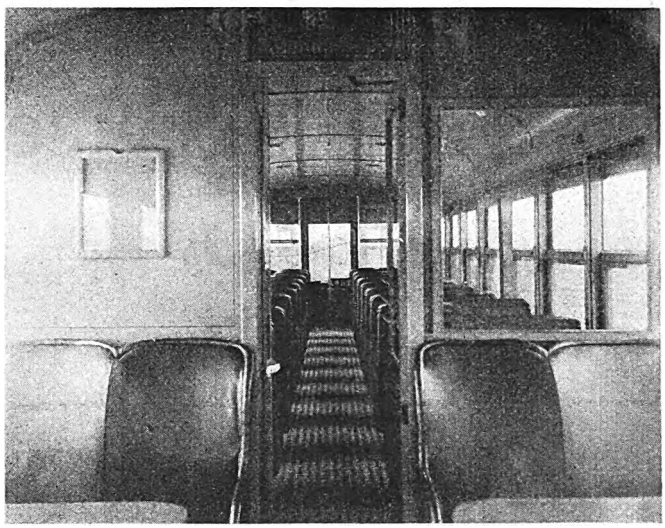
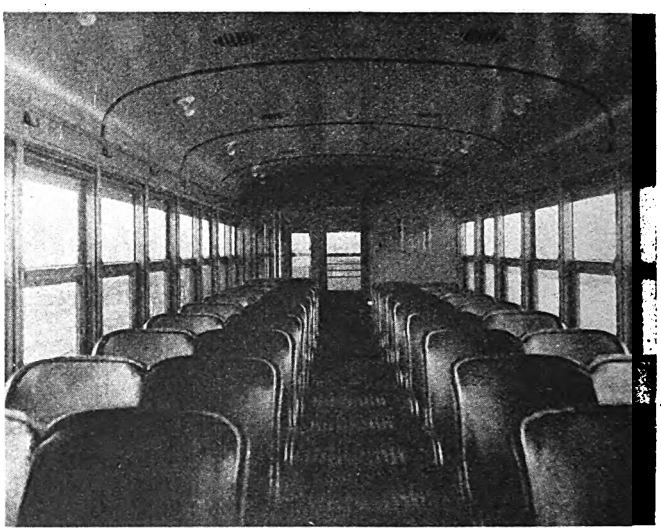


Looking forward from smoking compartment of the Houston North Shore Railway's new interurban cars. Note the comfortable seats and trim interior



Main passenger compartment. Seats are upholstered in leather. Interior trim is painted and striped similar to the most recent practice in Pullman cars

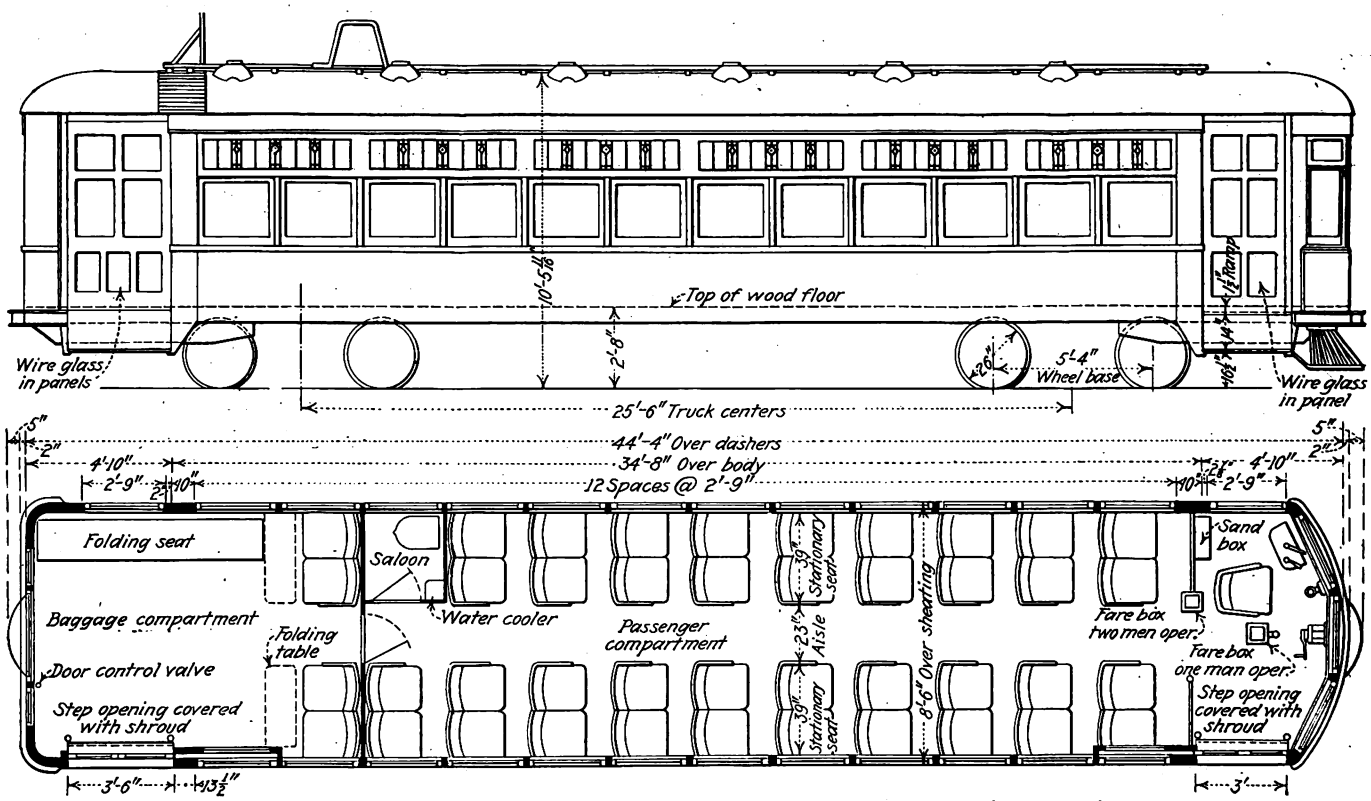
the double top sash stationary. Completing the flexible arrangement of this vestibule is the 42-in. door opening on the right-hand side and fitted with a sliding door. Both front and rear doors have door engines and all safety device mechanism. The rear door is under the conductor's control by means of a valve.

Side sheets of the body structure are No. 13 gage steel. The body frame end is stiffened at each corner with pressed steel pier panels 10 in. wide riveted to T-iron side and corner posts extending from side girders to letter panels and riveted to them. Tongue and groove poplar, ⅜-in. x ½-in., sheaths the flat arch roof, which is covered with heavy-weight canvas. The pine floor is covered with ¼-in. rubber tiling glued in place.

The upper sash is of one continuous length, Pullman type, glazed with prismatic glass of Gothic pattern and framed so that each top sash section extends over two lower sash. Vestibule end sash and doors are of $\frac{3}{16}$-in. polished plate glass and the bottom panels in the sliding doors are reinforced with netting.

Birch sash and doors, Agasote for the wainscoting and headlining, oxidized bronze trimmings, an 8-in. x 10-in. wood order board, located between the controller and brake valve, double prong coathooks and Curtain Supply Company's curtain fixtures are some of the attractive features of the interior.

In the main passenger compartment each car is equipped with eighteen bucket type, leather-upholstered, stationary seats and one longitudinal seat. The seats are 39 in. over all, with high backs. Cushions and backs are of deep spring construction. Pressed steel is used for the aisle end brackets, pedestals and arm rests and



Seating plan and general dimensions of the Houston interurban cars

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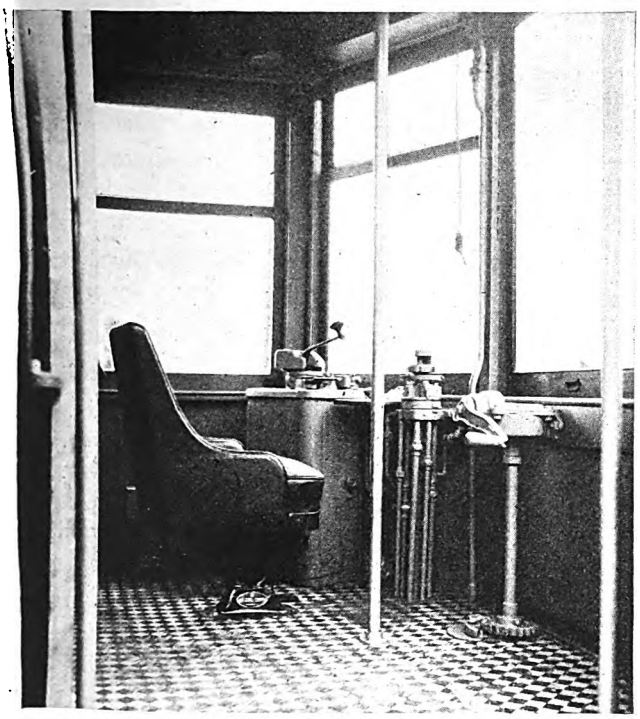
the grab handles are of aluminum. The motorman has been provided with the Brill bus pattern seat.

Each car has been wired in four circuits of five lights each, one circuit including the two lights in the front sign box and three lights in the smoking compartment. Flush-type porcelain receptacles without shades comprise the lighting fixtures in the main compartment and smoking room. All body and platform lights are of the 50-watt mill pattern, with the bottom half frosted. Emergency lighting is provided with five 4-cp., 6-8 volt lamps in each marker light and one in the center of the passenger compartment ceiling.

Crouse-Hinds Imperial arc headlights were specified. Miscellaneous equipment includes: Window screens of



The front vestibule is neat and trim. A leather upholstered seat insures comfort for the operator. Between the brake valve and controller is a convenient shelf for train orders

brass fly wire, a Pyrene fire extinguisher with cabinet, motorman's climbing steps, Ohio Brass trolley retrievers, twelve Brill exhaust type arch roof ventilators, Hunter destination signs, Duraduct power wiring and safety car equipment.

The mechanical equipment consists of Brill 177-E-1 trucks, four General Electric 35-hp. motors, single-end air-brake equipment including a C.P.-27 compressor, one straight air valve and air whistle, and an air brake back up valve. General dimensions of the cars follow:

Length over dashers	44 ft.	4 in.
Length over body	34 ft.	8 in.
Length of platform over dashers	4 ft.	10 in.
Bumper projection (each end)		2 in.
Rail to top of trolley boards, approximately	10 ft.	8 in.
Rail to underside of sill		27⅜ in.
Extreme width	8 ft.	8⅜ in.
Width over side plates	8 ft.	6 in.
Rail to first step (front end)		16½ in.
First step to second step (front end)		14 in.
Ramp in platform floor		1½ in.
Door opening (rear end)		42 in.
Door opening (front end)		36 in.
Truck centers	25 ft.	6 in.
Wheelbase	5 ft.	4 in.
Size of wheels		26 in.
Post centers		33 in.
Width of aisle		23 in.
Width of seats		39 in.
Seating capacity		46 in.
Height from floor to underside of ceiling	7 ft.	7 in.

New Jersey Bus Regulations Revised

REVISED motor coach regulations adopted by the Board of Public Utility Commissioners in New Jersey following considerable study of the subject and co-operation by the motor coach division of the Society of Automotive Engineers contain several important changes from the old regulations adopted in 1924. One of these is the dividing of motor coaches into city type single-deck vehicles and the parlor car type, with a clear division of the regulations applying to each class.

One of the most important changes is that the emergency door may be located in the center rear or elsewhere as the Board of Public Utility Commissioners may direct. Motor coach builders and operators contend that the best location is at the left side of the rear instead of at the center of the rear.

Instead of specifying a maximum length of body of 24 ft., the new regulations provide that the minimum length of body shall be 16 ft. and the maximum length of the vehicle with body shall not exceed 28 ft. The body width shall be between a minimum of 7 and a maximum of 8 ft. and the inside height at the center shall be between a minimum of 6 ft. 4 in. and 6 ft. 9 in. in the city type motor coaches and shall be 5 ft. in the center in the parlor car type. The body must not overhang the rear axle by more than $\frac{7}{24}$ of the total length of the vehicle, nor overhang the rear of the frame by more than 15 in.

The regulation with regard to the chassis frame has been changed so as to require that it be designed and constructed properly and safely to carry the body with its full passenger load. The top of the frame in city type coaches must not exceed 32 in. from the ground and in the parlor car type must not exceed 30 in.

Another notable change is that the exhaust pipe, including exhaust heater pipes, shall be extended to the rear end or to a point immediately in front of the left rear wheel. This revision is in line with the claims of motor coach operators who have found that by discharging them into the agitated air in and around the wheel housing the exhaust gases are mixed with the air and thus diverted from the air whirl at the rear of the body.

The new clause relating to brakes requires not less than two sets of brakes, each operating independently of the other, except that with four-wheel mechanical brakes two separate controls alone will suffice. Another provision is that the gasoline tank shall not be located within the body and that it shall be filled and drained from the outside.

Financial Aid in Brooklyn Amounts to $1,269,536

DURING a quarter of a century of service of the Employees' Benefit Association of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., completed last May, its financial aid to its members and their dependents in times of sickness, injury or death totaled $1,269,536. The total dues and other fees paid in by the members during the past 25 years were $1,229,474. The total disbursements for all purposes by the association during the first quarter century of activity aggregate $1,569,218. Of this sum more than half was paid out in sick benefits direct to members. The total payments for sick benefits were $888,123, while the total death benefits paid in the same period amounted to $381,413.

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Corrugation Studied at Montreal

Investigation indicates that character of rail surface is more influential than internal structure

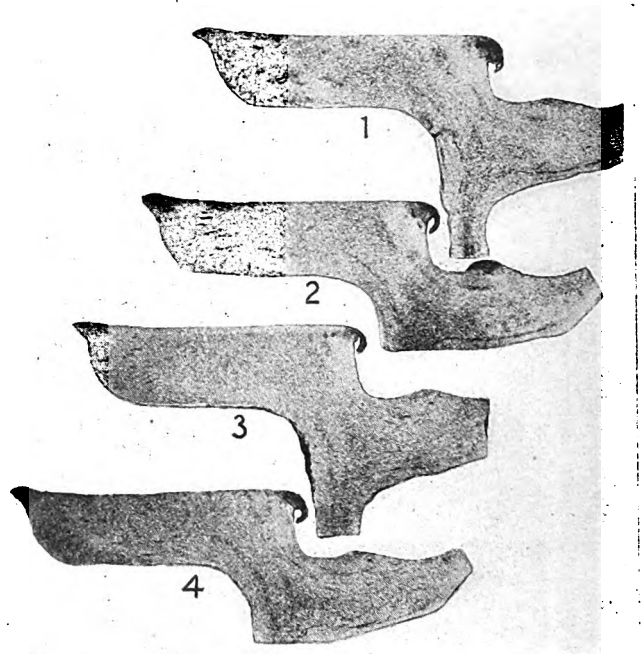
IN CONNECTION with the work of the committee on rail corrugation of the Canadian Electric Railway Association specimens of deeply corrugated rail were removed from service in Montreal, plan and profile drawings prepared from them, the corrugations photographed, observations on hardness made over the running face and microphotographs secured of cross sections at crests and valleys of the corrugated spots. This investigation was carried out by Gordon Sproule, M.Sc., assistant professor of metallurgy McGill University.

Specimens examined were (a) parts of four transverse slices of a lipped rail, punch marked (.) (..) (...) and (....), which had been cut alternately from the troughs and crests of the waves in a badly corrugated rail, and (b) a length, about 40 in., of the head of the rail. The slices, as may be seen from an accompanying illustration, showed the rail to be badly worn. The head was worn down until the wheel flanges ran on the lip, and in places the latter was stripped off.

The length of rail head had been cut off the web, presumably parallel to the base of the rail. It showed a very decided camber, being convex up, evidently due to the release of compression stresses in the wearing surface, developed by the rolling and pounding of the wheels. According to the report, this circumstance suggests a feature in the manufacture of rails which may be worthy of consideration in connection with corrugation.

Rails, when they are rolled, are given a definite camber (head convex) when hot, because, as they come from the rolls, the lighter base and web are at a lower temperature than the heavier head, and the camber counteracts the greater shrinkage of the head as the rail cools, so that the rail is straight when cool. No doubt the temperature variations and amount of camber required are occasionally misjudged, resulting in rails that have a camber after becoming cool and necessitating a straightening operation. It would seem highly desirable that specifications for tramway rails require that such straightening be done in rolls and not step by step in a press.

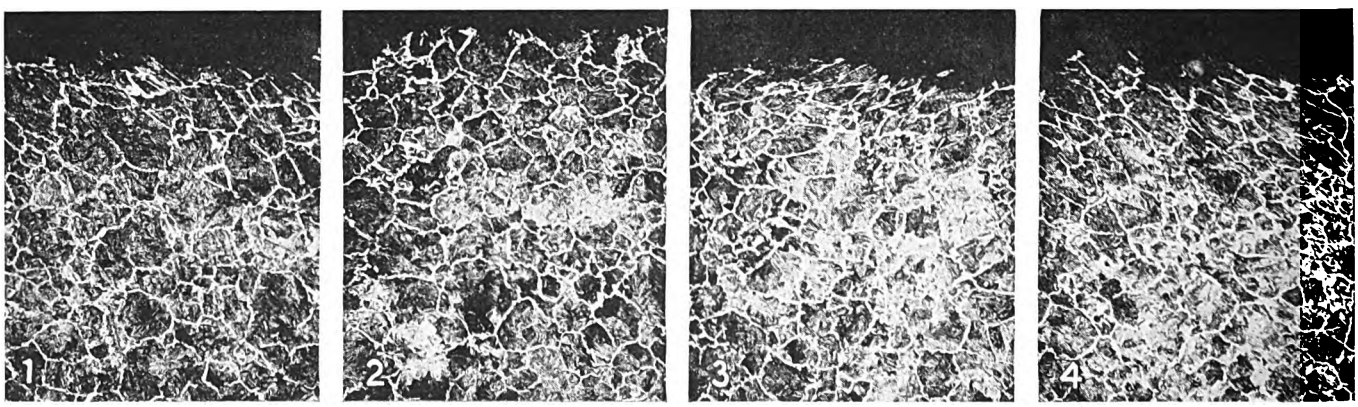
The specimen selected was badly corrugated, showing



Four transverse slices taken for examination from a piece of badly corrugated rail in Montreal, the first and third being from the troughs and the second and fourth from the crests of the waves

in the 40 in. three distinct hills (or crests), a double hill or plateau and four vales (or troughs). Besides the visual examination, the head and cross-sections of the rail were tested for hardness and examined microscopically.

Brinell impressions were made approximately along the center line of the wearing surface of the 40-in. length of head, spaced a little more than 1 in. apart; 31 impressions were made in 38 in. The figures are given in an accompanying table. A distinct and consistent relation is apparent between the hardness and the hills and vales of the corrugations. It is obvious, the report states, that the corrugations are not the result of varying hardness, but that the varying hardness is the result of the corrugations.



The appearance of the slices after surfacing and etching was much the same for all four specimens

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BRINELL HARDNESS READINGS ALONG CENTER LINE, TOP OF HEAD

Position	Hardness	Remarks	Position	Hardness	Remarks
1	271	.....	17	244	.....
2	269	.....	18	262	.....
3	255	.....	19	269	Vale
4	248	Hill	20	269	.....
5	255	.....	21	255	.....
6	264	.....	22	243	Hill
7	269	Vale	23	254	.....
8	269	.....	24	253	Plateau
9	255	.....	25	255	.....
10	255	Hill	26	255	Hill
11	255	.....	27	263	.....
12	255	Vale	28	277	.....
13	269	.....	29	269	.....
14	269	.....	30	269	Vale
15	255	.....	31	255	.....
16	241	Hill			

At first sight it might seem probable that the rising side of the hills would be the harder, but the specimen is a left-hand rail and the falling side of the hills is consistently the harder, except at the so-called plateau. These facts suggest further study to see how the severity of the corrugations is related to the irregularity of spacing and how the hardness relation varies with the irregular wave spacing.

Even lacking this information, there would seem to be no doubt that the frequency of the waves, which are equally spaced, in the specimen rail, as they were encountered by wheels of cars moving at the average speed for the location, synchronized with the natural period of vibration of the wheels and axles, as governed by their weight and the character of the spring gear. This synchronism would be only slightly affected by the natural period of the rail and its foundation, and the pounding effect would be aggravated by a solid foundation. This argument points to advantages (1) in heavy wheels and axles and flexible spring gear, resulting in a low frequency vibration, longer waves, and easier riding cars, and (2) in designing several different truck constructions, so that an incipiently corrugated rail might be as little as possible subjected to synchronous pounding of one common frequency. In any case, probably the waves gradually move along the rail as wear proceeds, and their final position bears no relation to the position of any original crest or hard or soft spot that started the growth of corrugation.

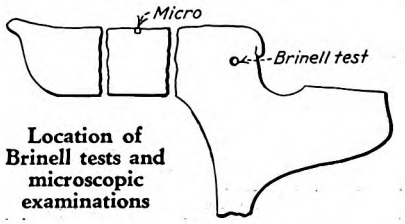
Brinell hardness tests were also made of the slices, at a central level in the head, nearly above the web, as shown in an accompanying sketch, with the following results:

Slice No.	1	2	3	4
Brinell No.	251	255	248	241

This interior hardness is about the same as that of the hills and, of course, shows much less variation than the surface hardness readings. The Brinell tests show the steel to be very hard.

The four transverse slices were surfaced by hand and deeply etched. They were photographed in pairs to make comparison easier and are shown in accompanying pictures. As may be seen from the illustrations, no great differences of structure were apparent; the steel is reasonably uniform throughout the section and from section to section. The flow line produced in rolling are indicated, in the region where the head and web join, by segregated constituents, and traces of a rim of blowholes show in the outer part of the head.

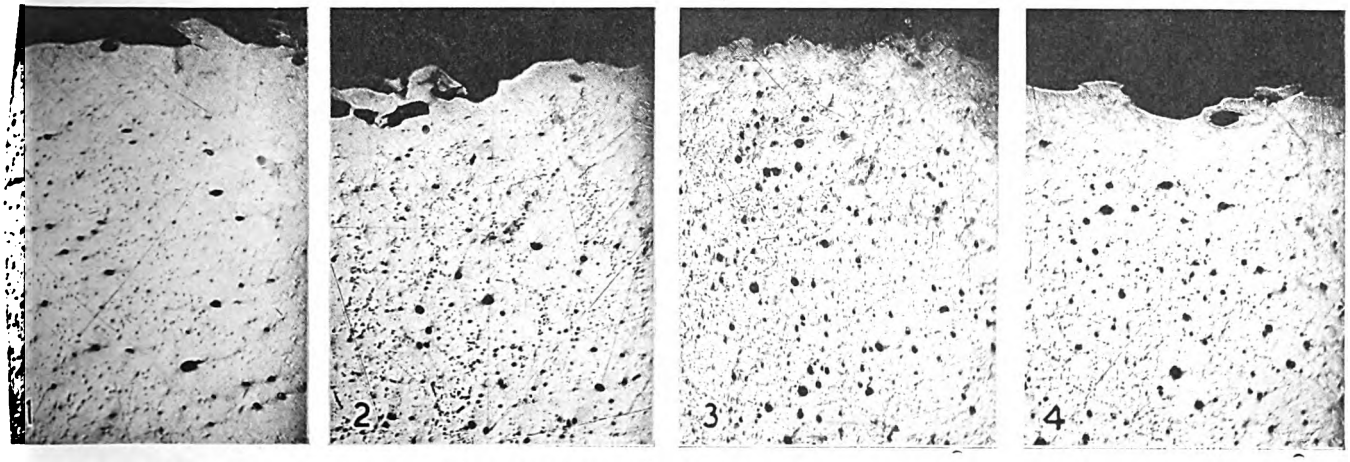
A sample was cut from each of the four transverse slices, in the position shown in the sketch. The effects of the previous deep etching were ground out and the same cross-sectional faces of the samples were polished for microscopic examination. An area, including the edge of the top surface, as shown in the sketch, was photographed in the plain polished condition to show the soundness or porosity of the metal. These are reproduced herewith. All micrographs were made at a magnification of 75 diameters. While photographs made under these conditions are apt to be misleading because the appearance produced depends a great deal on the technique of polishing and photographing through the exaggeration of very minute pores, it may be said that the size and number of the larger pores are about the same in each slice; No. 1 was evidently less eroded in the polishing and Nos. 2 and 3 more so than No. 4.



Location of Brinell tests and microscopic examinations

The photographs show very high carbon steel, probably between 0.7 per cent and 0.8 per cent C., in the slowly cooled condition; this agrees with the Brinell hardness figures obtained. The grain size is medium and the same from section to section, as would be expected.

An interesting thing is the visible result of the cold-work pounding and dragging done on the rail by the wheels. This is quite evident, although the sections are transverse and not longitudinal and although an appreciable amount of the surface metal was removed in the previous deep etching. The deep etching also accounts for the jagged appearance of the edge. In samples 1 and 4 the effect is visible to a depth of about 1/50 in. and is away from the lip of the rail. In sample 2 there is



Microscopic views at enlargement of 75 diameters show the varying porosity of the metal

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Santa Ana's new electric railway station

no sign of the cold-work. This agrees with the fact that 2 was cut at a hill-crest and that the crests are soft compared with the values. Why No. 4, which was also from a crest, shows so distinctly the cold-work effect cannot be explained, but it may be pointed out that its head thickness is considerably *less* than that of 3, said to be from the adjacent vale. In sample 3 the apparent depth of the cold-work effect is less than in 1 and 4, agreeing with the greater head thickness, and the dragging effect seems to be in the opposite direction to that in 1 and 4, namely, toward the lip of the rail.

Under the microscope the lower, unworn side of the head is seen to have a layer of considerable thickness of partly decarburized metal. The amount and uniformity of this layer on the original wearing surface would no doubt be a factor in the tendency of the surface to develop waves.

Preliminary conclusions drawn from this investigation are: (1) The rail should be rolled straight and not kinked by "gagging." (2) The character of the original surface, as regards uniformity of hardness and soundness, would be a factor in the starting of waves. (3) The internal structure probably has no effect—the present very badly corrugated rail is very hard and uniform. A rim of sub-surface blowholes might have some effect, but the surface conditions would be the main factor, as stated in (1) and (2). Thus, while sound steel is in general preferable to rimming steel, a more direct benefit would be incurred by the use of the Lackawanna "de-seaming" process—if it is still in use—than by insistence on dead-setting sound steel. (4) Synchronized pounding of the wheels would seem to be a most important factor. Efforts might be made to reduce and to vary the frequency of the natural period of wheels and axles.

New Station Opened by the Pacific Electric Railway

WITH fitting ceremonies, participated in by civic organizations and officials of the system, the Pacific Electric Railway, Los Angeles, Cal., opened a handsome freight and passenger station at Santa Ana, Cal., on June 18. Exclusive of the land, it represents an expenditure of approximately $40,000. Of Spanish architecture, the new structure occupies a ground space of 70x250 ft. The waiting room is located in the front of the building, providing easy access to all trains; the office is in the middle, and the freight warehouse in the rear. The layout is so arranged as to provide a space in the rear between the station and the adjoining building, which provides ample room for vehicles using the freight loading platform. There is also an entrance from the rear platform to the main office that permits business to be transacted without the necessity of patrons making the customary trip from the warehouse, around the building, to the front entrance.

Aside from the Pacific Electric station, the building will be occupied by the American Railway Express Company and a light refreshment parlor.

D. W. Pontius, vice-president and general manager Pacific Electric Railway (third from left) and other officials just after they arrived at Santa Ana, Cal., for the official opening of the new passenger and freight terminal

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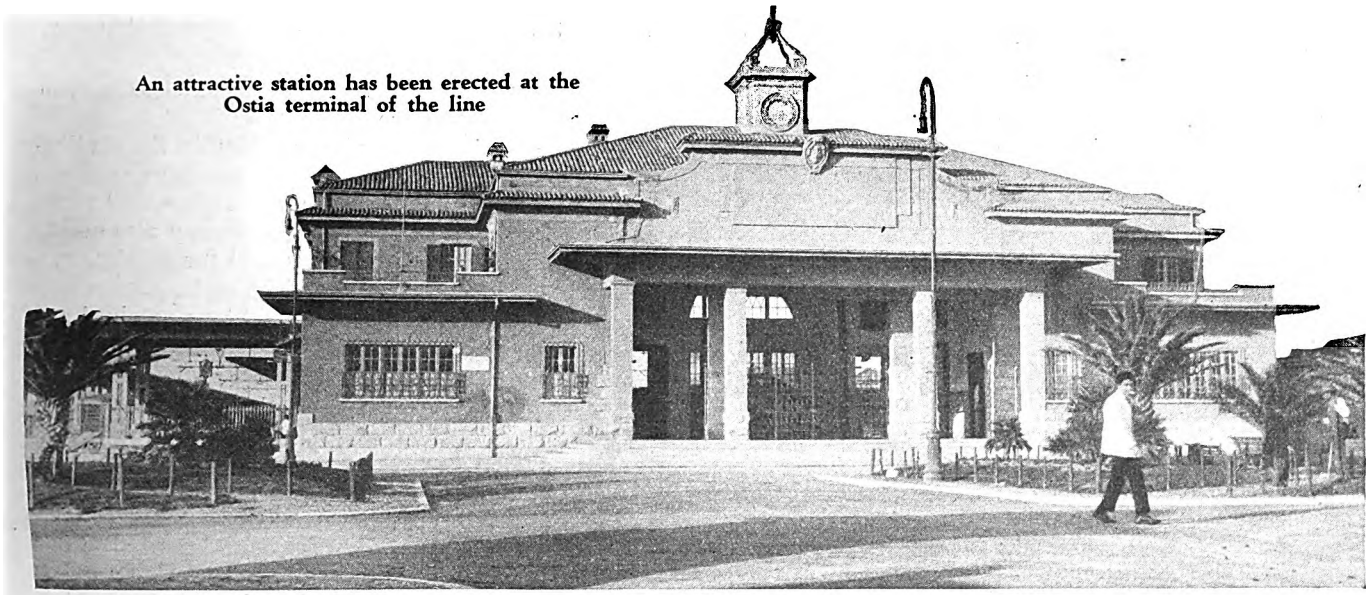


An attractive station has been erected at the Ostia terminal of the line

High-Tension D.C. Development

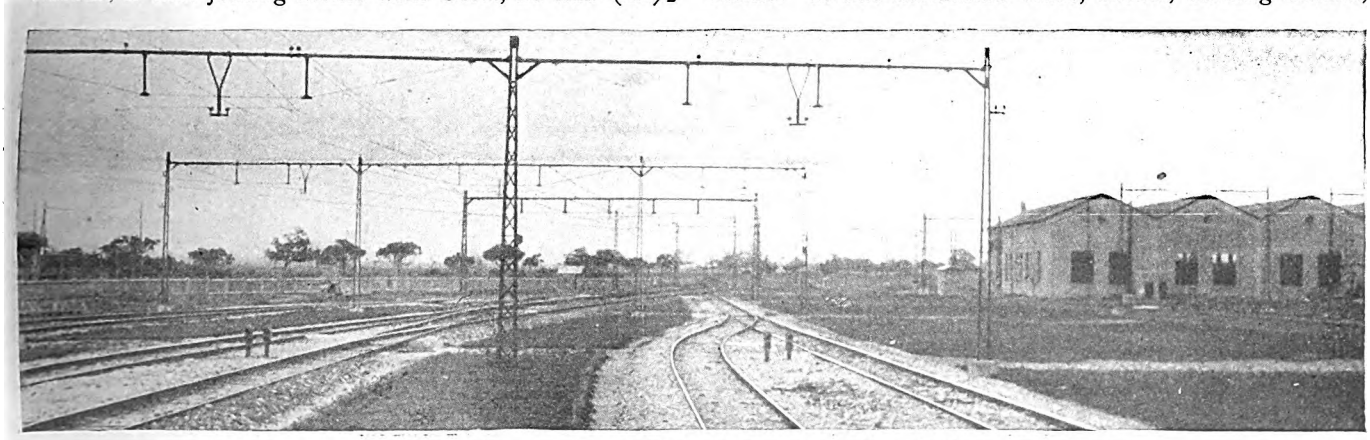
in Southern Italy

Rome-Ostia Railway, operating high-speed suburban service to seashore resort, is an example of 2,600-volt line. Another line selected for d.c. equipment extends from Naples to the Adriatic

By Henry W. Blake
Senior Editor ELECTRIC RAILWAY JOURNAL

RAILWAY electrification has proceeded rapidly in Italy because of the abundance of water power and the scarcity of fuel. Italy possesses no coal deposits of moment, and the coal required for its steam locomotives has to be imported. On the other hand, the Alps and the Apennines possess many streams which are being harnessed for the production of electrical energy.

One of the latest heavy electric traction undertakings, as well as one of the most interesting for many reasons, is that joining Rome with Ostia, 20 km. (12½ miles) away. Ostia is near the mouth of the Tiber River and in ancient times was the port of Rome. Now its former harbor is largely filled up and it has lost its commercial importance. Instead, it is the resort of the pleasure seeker and the antiquarian. The latter is interested in the ruins in the "old town," the former in the modern seaside resort of the "new town," some little distance away. In fact, Ostia Mare, the new town and terminus of the electric railway, is the principal shore resort of Rome. It has handsome villas, casino, bathing houses,



Overhead construction at Ostia station, Rome-Ostia Railway

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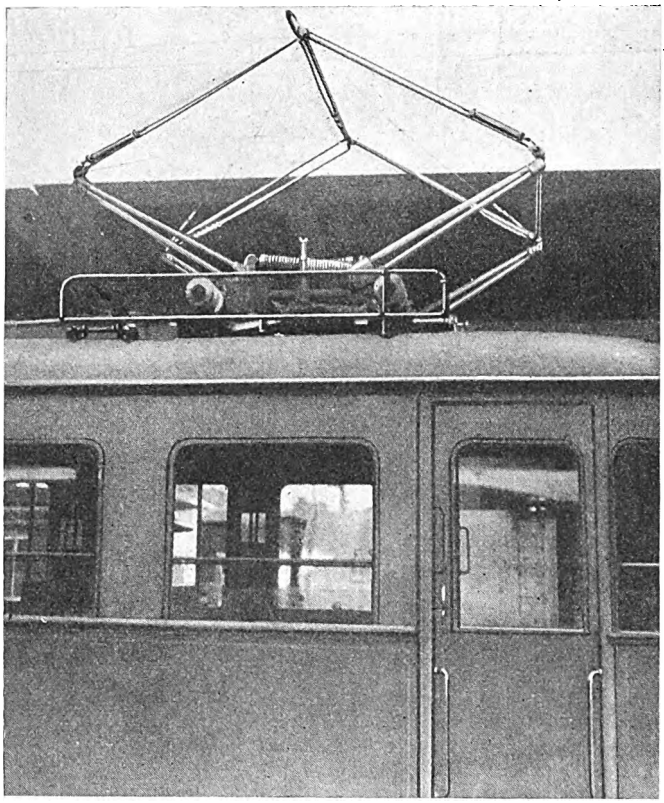


The Rome-Ostia motor cars carry two pantographs, one at each end

hotels and restaurants and all the accompaniments of a Long Beach or Atlantic City, though much smaller than either of these well-known American resorts.

The Rome-Ostia Railway is not a part of the Italian trunk line system. It is owned by a private company and is really a double-track rapid transit line, designed primarily for excursion and commuter travel. Because of such service its cars are built wider than standard trunk line coaches, the cross seats accommodating three passengers on one side of the center aisle and two passengers on the other side of the aisle. Motor car operation with trailers is used. A chief feature of interest is the use on the trolley wire of 2,600 volts in a country which up to the time of its construction was committed (at least so far as main line electrification is concerned) to the three-phase system.

The Rome-Ostia Railway is owned by the Società Elettroferroviaria Italiana, which also owns the Casino and adjoining bathing pavilion with more than 500 rooms at the Ostia terminus. The same company also owns a great deal of land, which is being sold for building purposes in plots, in quite the American style, often on the installment plan. Much of this land was received as a subsidy from the government for the construction of the line, under the franchise which the company received on May 5, 1924.

The service is naturally more frequent in summer than in winter and on Sundays and holidays than on weekdays. At present, the shortest headway in summer between trains is fifteen minutes, when the system would have a capacity of 5,000 passengers an hour. The fare one way is 4 lire (20 cents) and the round trip fare is 6.80 lire (34 cents). A combination ticket, providing for the railway trip each way, admission to the Ostia excavations and to the Casino, and giving a discount of 15 per cent on refreshments purchased at the railway company's restaurant at Ostia, is sold for 11 lire (55 cents). There is no division of passengers into classes.

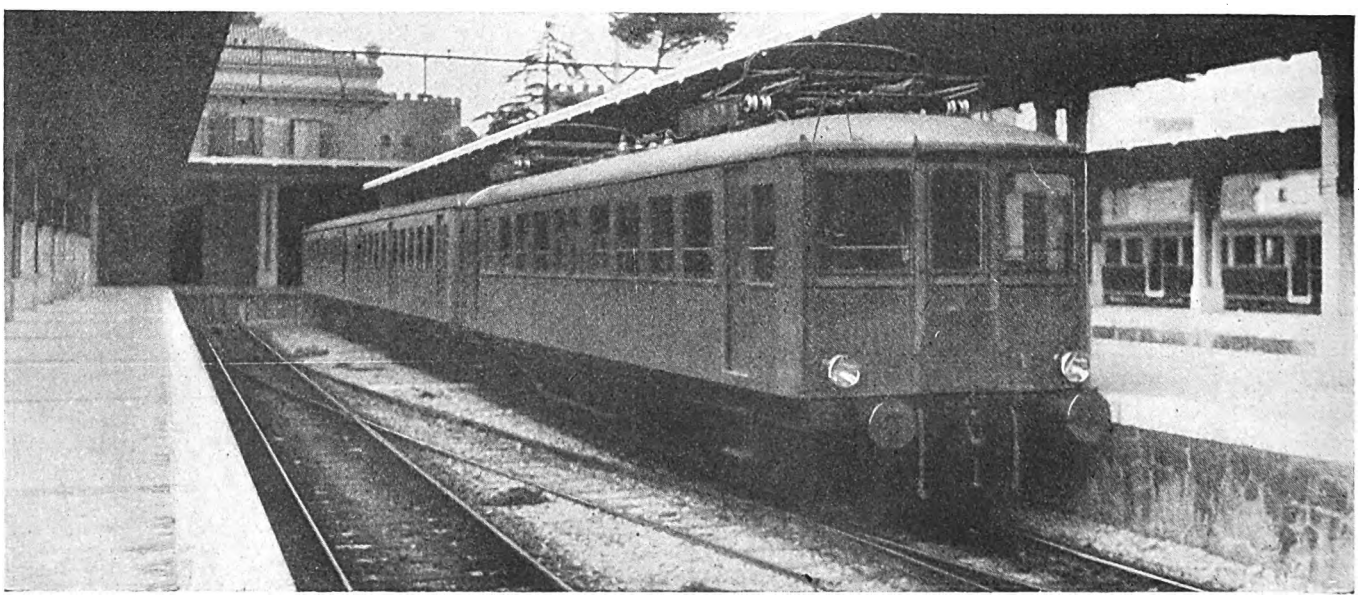
The cars are shown in the accompanying illustrations. They are about 10 ft. wide and seat 80 passengers, with standing room for about 50 more passengers, in each car. Four motors are used on the motor car and the controller provides for six series and four parallel running positions, as well as for points for electrical braking. The motor car carries two pantographs.

The overhead system, which is of the catenary type, is carried on trusses, as shown in the accompanying engravings.

High-Tension D.C. for Future Electrification

The road is interesting not only for itself but as one of the first examples in Italy of the use of direct current in railway electrification instead of three phase, with which most of the heavy traction lines in northern Italy are equipped.

Of course, on a short line with heavy traffic and frequent stops like that of the Rome-Ostia Railway, direct current possesses notable advantages, but these conditions do not apply on the Federal State Railways electrification



The wide platforms at the Rome terminal facilitate the rapid loading and discharge of crowds of passengers

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from Naples east to the Adriatic, for which 3,000 volts d.c. will be used. Incidentally, it may be added that Italy has now a 4,000-volt d.c. line, though it is a comparatively short road and not a part of the Federal State Railways. It runs between Turin and Lanzo and is owned by a private company. The two motors on each truck are each designed to operate under 2,000 volts and are permanently coupled in series.

Most of the three-phase electrification, of which there is a great deal in Italy, especially around Genoa and Milan, uses 3,700 volts on the trolley wire and is at 15 cycles, though on some lines 45-cycle equipment has been installed to get a more ordinary frequency. The railway department purchases about one-third of the electrical energy it uses and its tendency now seems to be rather to purchase than generate more power.

The decision to use high-tension direct current for future electrification south of Florence was reached some time ago as the result of a special government inquiry, and the section from Benevento to Foggia of the Naples-Eastern line is the first to be so equipped. The locomotives for this line are now being built. Some of the objections to the three-phase equipment which led to the decision in favor of direct current are said to be the high maintenance cost of three-phase equipment, owing to the small air gap required in the motors; difficulties in increasing very much the voltage in the contact wires over that at present in use because of trouble at switches and cross-overs, and complications in the control connections if an effort is made to provide more than two running speeds for the locomotives.

Prizes Awarded for Essays on Service Due the Passenger

By Frank L. Butler
Vice-President Georgia Power Company, Atlanta, Ga.

On THE street cars in Atlanta there are some 900 trainmen, each a representative of the company. Recognizing the power for good will, or the opposite, which lies in the countless personal contacts of the trainmen with the public, in January the management asked the question "What Service Do We Owe a Passenger for His Fare?" of every man on the cars and buses of the Georgia Power Company. A written answer was requested, and prizes were awarded for the best thirteen replies: First prize $10, second prize $5, third prize $3, and ten prizes of $1 each. Conditions of the contest allowed three weeks for submitting replies and stated that the judges would consider ideas only, giving no weight to spelling, composition, neatness or literary style in arriving at their decision. It was not expected that a large percentage of the trainmen would submit answers in writing, but it was believed that many who did not would give some thought to the subject and be benefited accordingly, for a man cannot devote even one hour of intelligent thought to his job and not be a better workman therefor.

When the contest closed, however, approximately twice as many answers had been submitted as had been expected, and the quality of many indicated much thought in their preparation. Discussions overheard among the men bore out the belief that the question would be productive of thought whether or not a written answer was turned in. A monthly safety dinner attended by the prize winners, as well as by 80 other trainmen who had excellent accident records during the preceding month, was the occasion for announcing the decisions of the judges. First prize was awarded to Conductor W. C. Alsobrook, second prize to Conductor C. H. Vaughn and third prize to Conductor S. J. Steele. In making the presentations, one of the judges read a paper which was a composite reply based on all of the answers. An abstract follows:

What Service Do We Owe a Passenger for His Fare?

Service we owe a passenger begins before a car leaves the barn, by our examination of it. The sign "Car Stop" is an invitation to the public to patronize our business. The signs on the cars should be distinct, well painted, and properly set. We should never run off and leave a person who is making an effort to reach the car, if there is an opportunity afforded, within reason, to pick him up. He might wish to catch a train or have some urgent business at his destination, so as to cause him serious trouble if he misses the car.

We should call out the routes and destinations as passengers board our cars, especially in the center of the city where several lines use the same tracks. This should be done because some people cannot read English, some cannot read at all, some are near-sighted, some half blind, some totally so, some are absent-minded, and some are half-distracted from dodging automobiles.

The most important thing which we owe a passenger for his fare, first and above all, is safe transportation—safety in boarding, safety in being transported and safety in alighting. Make sure that all passengers are on or off before closing the door or starting the car. Try to prevent them from boarding or leaving moving cars, and caution them of the danger of foolhardy acts. We owe them smooth starting and stopping of cars, feeding the current correctly so as not to jerk the passengers. Don't enter curves too fast so as to throw passengers off their seats. We owe them safe operation of the car in relation to other vehicles, with special care at street crossings, for if the car collides with another vehicle, passengers may be hurt, and in any event they will be delayed. Flag railway crossings properly. Stop clear of excavations, thus affording a safe place to alight. Don't make a passenger step off in mud or water, if the stop can be made a few feet away. Assist infirm or crippled passengers not only off the car but over to the curb, thus holding back auto traffic by not starting the car.

Don't let passengers sit in the windows or put their arms out, and keep them off the controller stands. See to it that aisles and platforms are kept clear of obstructions, such as tool boxes, clothes baskets, etc.

We owe a passenger comfort, which includes proper ventilation, with heat in cold weather. Cars should be properly lighted. Always have the seats turned the right way. When necessary, rearrange the seating of white and colored passengers, so as to give every one a seat if possible.

We owe a passenger courtesy. Let us be sure we understand just what courtesy is. True courtesy comes from the heart and promotes good will for the company on the part of the traveling public. Courtesy does not mean that you have to greet every passenger as a long lost brother, or bubble over with joy just because he is allowing us to give him 10 cents worth of service for 7 cents. We should give him a welcoming smile, thank him for the fare paid, give him the largest denomination of change out of coin or bill tendered, unless otherwise specified, and offer to sell him tickets and punch his transfer promptly. Answer politely all questions pertaining to the business of transportation. In order to do this intelligently, we should be well posted as to the system and the city. Give special attention to strangers, as they are unfamiliar with the locations, for if we do this, they will go away with a favorable impression of both the city and the company. Explain blockades and rerouting when called upon. Use patience and show appreciation of patronage, as this is a part of good salesmanship. Give assistance to those who need it, such as little children, the old, lame, feeble or blind.

We owe a passenger accuracy, attention, alertness, vigilance and dependability. We should be sure to punch his transfer properly so as to cause no embarrassment when the transfer is presented to the other conductor or operator.

We owe a passenger service that is safe and dependable at all times, rendered in a courteous manner by neat trainmen, in cars operated smoothly, rapidly and safely. We owe it to him to be thoroughly familiar with the company's rules, and to use common sense, good judgment and play safe. We owe it to him to be careful, capable, efficient, sober and trained to give service as nearly perfect as is humanly possible. We owe a passenger satisfaction because he is our customer. The service we owe a passenger for his fare might be summed up in the Golden Rule: "Do unto others as you would have them do unto you."

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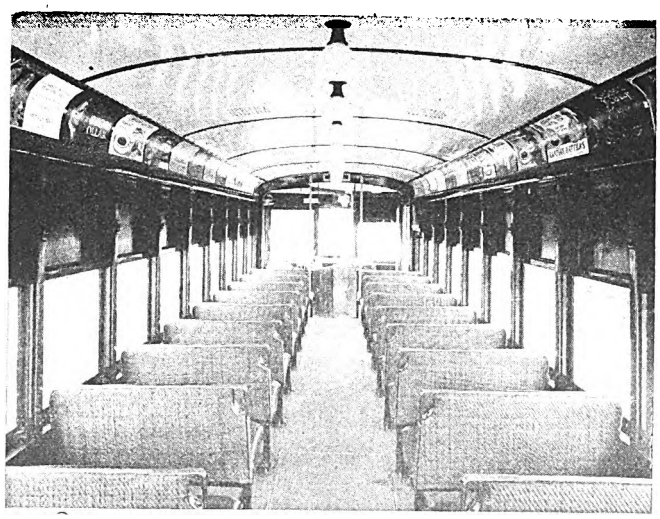
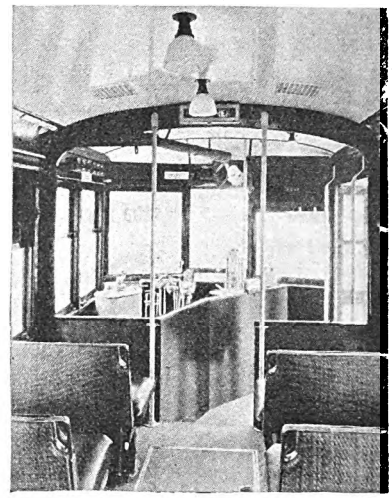
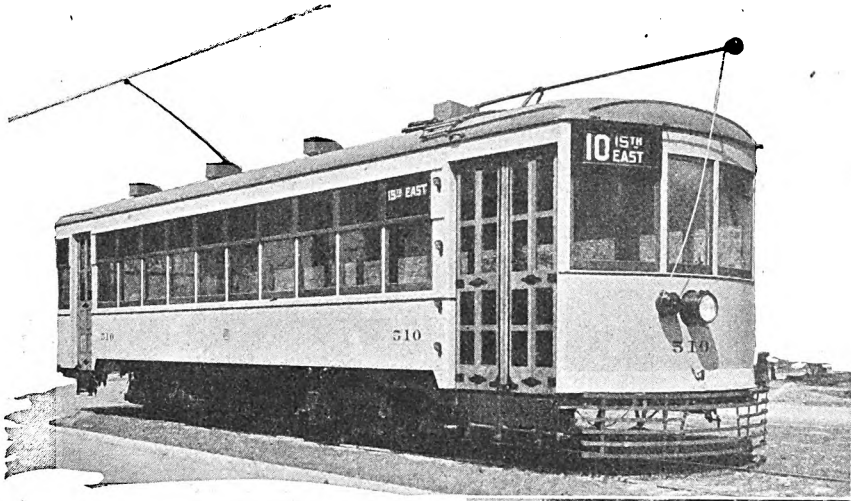
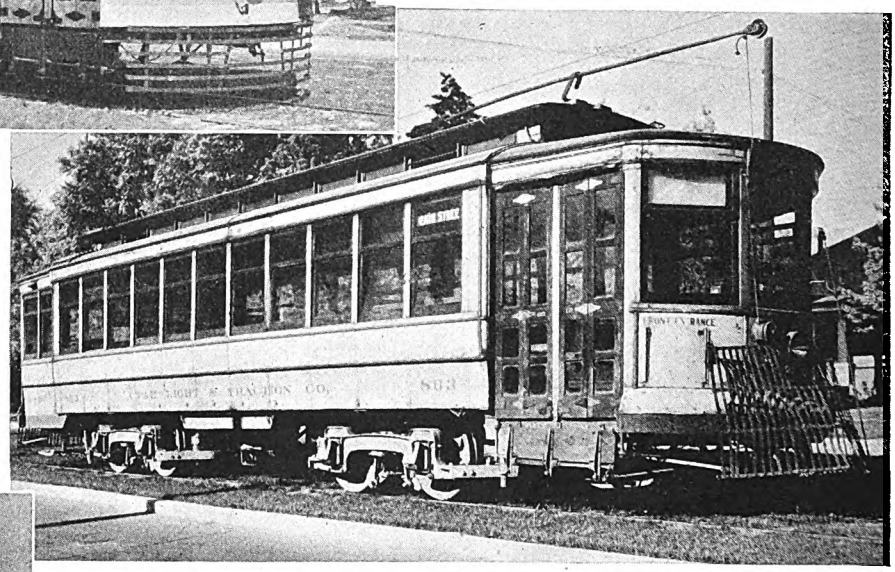
The Spirit of Progress Waves Wand Over Salt Lake City Cars

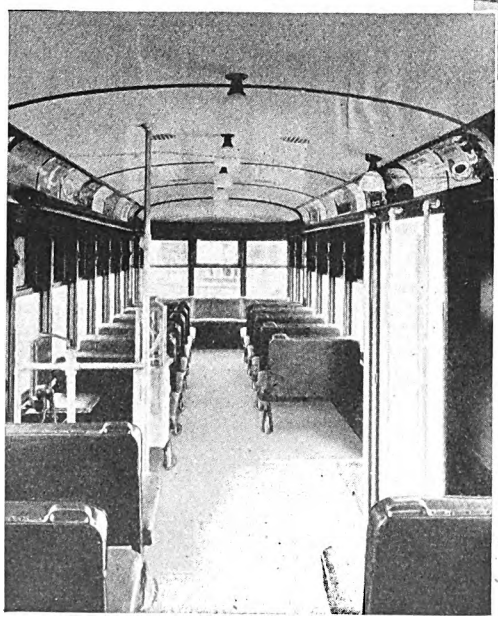


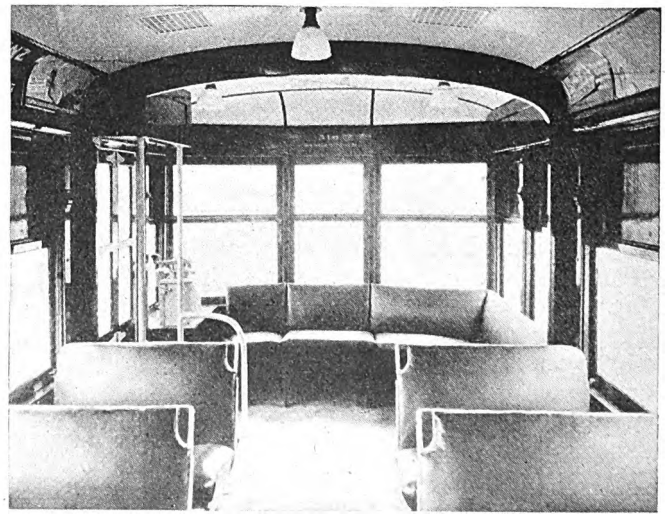






Glimpses of the spacious interiors and graceful exteriors of the new car bodies which were installed on rehabilitated trucks. Above is car 510, the finished product, transformed from car 863, at right. Note the pleasing illusion of rattan seats from the rear and leather covering as viewed from the motorman's position.





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Company Consults Its Patrons on Modern Car Design

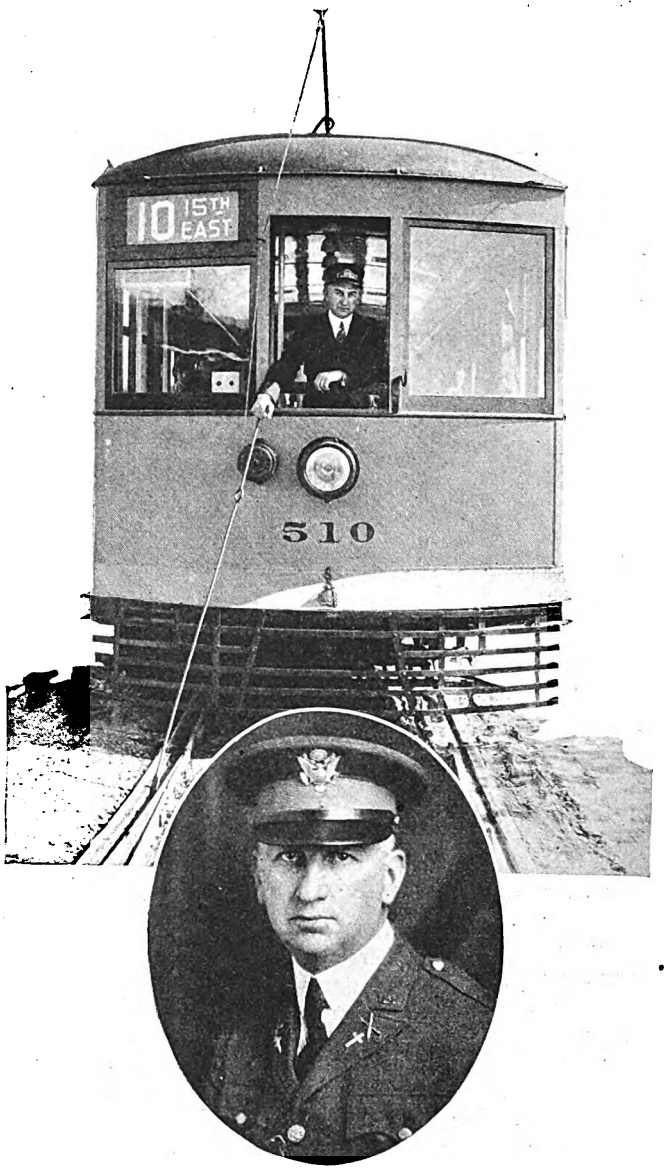
By F. D. Heiges
Office Engineer Utah Light & Traction Company,
Salt Lake City, Utah

Utah Light & Traction Company's co-partnership with the public insures popular transportation in the City of the Saints

SPURRED by a desire completely to rehabilitate its rolling stock to meet the demands of modern patronage and at the same time effect such reconditioning at an expenditure within its means, the Utah Light & Traction Company, Salt Lake City, Utah, called in the public as a consultant. The net result—the issue was successfully met by placing an order for ten new car bodies and five trailer bodies and fitting them in the company's shops with carefully overhauled motors and trucks from existing equipment, all of which was accomplished at a cost of approximately $6,000 per unit. As a fitting climax to this co-partnership, Salt Lake City witnessed a street car parade unique in its annals, and the forerunner of a new era in its local transportation.

It having first been decided that the public should have a hand in the modernization program, an "840 class" car (approximately 40 ft. x 8 ft. 5 in.) was remodeled to conform with the company's idea of a modern street car. This unit was then operated for several months, changes and alterations being made as the need for them developed and in accordance with suggestions obtained from passengers. The result of this procedure placed the management in a position to select those features of design and equipment which proved to be most desirable and also revealed that such replacement was less expensive than rebuilding and much more satisfactory from the standpoint of the company and, what was more important, its patrons' tastes. That the company's judgment was sound is attested to by the public's reaction, of which mention is made further on in this article.

With the receipt of the new bodies from the American Car Company, St. Louis, Mo., the modernization program has followed these lines: The Westinghouse 101-B motors that are being used under the car bodies have been carefully overhauled and thoroughly cleaned. Housings have been rebored and armatures rewound. Trucks have been redesigned by removing superfluous parts, revising and improving brake equipment and lightening in other ways. These changes and improvements furnish trucks and motors that will keep the new cars in operation continuously except for periodic inspection and cleaning.



The Mayor "motorman" on one of the new cars

During a parade of the rehabilitated equipment Mayor Clarence C. Neslin operated one of the units on its maiden trip through the business district, successfully negotiating the heavy traffic and brief frequent stops that were necessary.

In the oval his Honor is shown in a different rôle. Salt Lake City's chief executive when he was chaplain of the 145th Field Artillery, during the late World War.

Next, all equipment, such as seats, glass, electrical equipment, controllers, gongs, trolley and base, heaters, headlights, air equipment, signs, fenders and sanders that had been taken from the old cars and which could be used, was thoroughly renewed before installing on the new bodies. All equipment that could not be used, either because of its obsolescence or unadaptability, was discarded. New Hale & Kilburn light-weight seat frames and pedestals support cushions taken from old seats from which the rattan has been removed with the exception of the back of the vertical cushions. Nickel seat handles have replaced the bronze pattern of the old equipment. Seat cushions and the front of the vertical cushions are upholstered in genuine taxi brown hand-buffed and pebbled leather. This color combination of leather and rattan is pleasing and desirable. It is only when one occupies a position in the rear of the car that the rattan is visible—from the front of the car one receives the impression of seats entirely upholstered in leather—the

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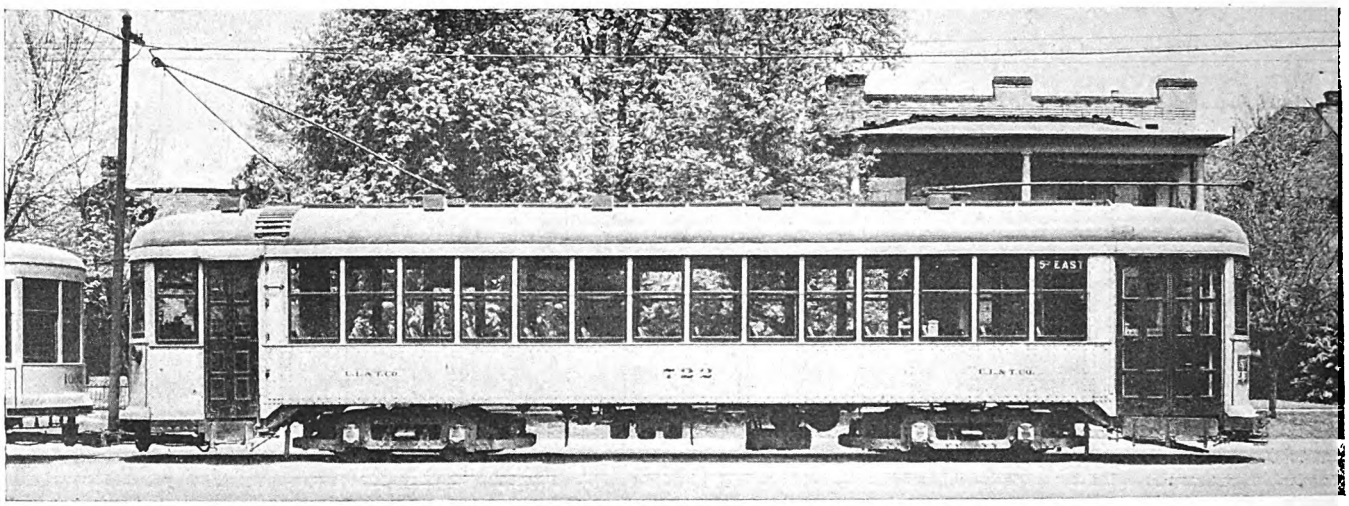


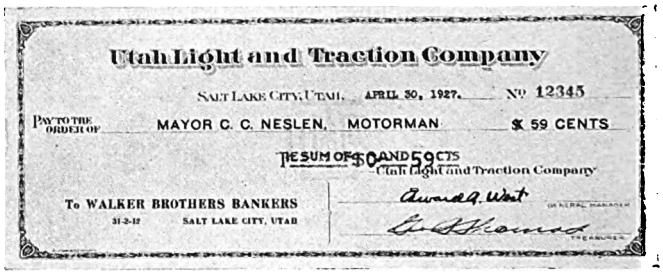
Motor car equipped with 60-hp. air-cooled GE-275 motors for hauling trailers

result being a uniform appearance of the car from either end.

Latest type rear-exit electro-pneumatic treadle equipment is being installed and each car is fitted with an illuminated combination route number and destination sign and an Oskelite stop light on the rear. A rich-toned brown glass was used in the upper sash of the side windows in place of curtains. One row of nine lamps with attractive shades has been placed in the center of the ceiling and battleship linoleum laid on the floor. By covering the felt that goes between the floor and the linoleum with waterproof paste on both sides to within 4 in. of the edge, applying waterproof cement to this border to insure thorough adhesion, and then laying and thoroughly rolling the linoleum, the company has obtained a smooth, finished and serviceable floor covering.

The cars are also equipped with Schechter window post casings, which permit raising the window to any height desired. All wiring for the cars is in conduit, terminating on the platform in switch boxes, all plainly marked. Air pipes and other accessories heretofore located under the vestibule roof or inclosed in a cabinet back of the operator's seat are installed within the area partitioned off for the operator, so that they are not visible to occupants of the car. White enameled headlining extending throughout the car gives a uniformly finished appearance. Thermostatically controlled heaters that cut in at 53 deg. and out at 55 deg. are located alongside the body of the car just off the floor between each seat. There is also a plug to which the operator can attach his portable heater.

For single-end operation the cars are arranged with double doors at the front and single at rear. The approximate length and width over all of the cars is 40 ft. x 8 ft. 5 in. respectively. They seat 48 people, eight of whom can be accommodated on a circular lounge seat at the rear end of the car. The step heights from the ground to the first step and to the floor of the car each are 14 in. The total weight of each unit is approxi-



Utah Light and Traction Company

SALT LAKE CITY, UTAH, APRIL 30, 1927. No 12345

PAY TO THE ORDER OF MAYOR C. C. NESLEN, MOTORMAN $ 59 CENTS

THE SUM OF $0 AND 59 CTS

Utah Light and Traction Company

To WALKER BROTHERS BANKERS

SALT LAKE CITY, UTAH

"A laborer is worthy of his hire." Check given Mayor Neslin for his services as motorman during the car parade

mately 35,000 lb., as compared with 50,500 lb. for the cars being retired. Fenders of the automobile bumper type greatly enhance the appearance of the new rolling stock, as do the attractive monograms which have replaced the corporate name. It is estimated that the 30 per cent saving in weight should allow the overhauled motors to perform more efficiently and with increased acceleration.

Standard orange for the body, striped in dark red on the window sills; a terra cotta roof, with trucks and

PRINCIPAL SPECIFICATIONS OF THE REHABILITATED UNITS

Name of railway	Utah Light & Traction Company
City and state	Salt Lake City, Utah
Number of units	10
Type of unit, one-man, motor, passenger, city, single end, double truck	
Number of seats, plus one end seat (lounge)	20
Builder of car body	American Car Company
City and state	St. Louis, Mo.
Date of order	11-16-26
Date of delivery	4-1-27; 4-14-27
Weights:	
Car body	10,250 lb.
Trucks	20,060 lb.
Equipment	6,611 lb.
Total	36,921 lb.
Bolster centers	15 ft. 8 in.
Length over all	40 ft. 0 in.
Length over body posts	27 ft. 6½ in.
Truck wheelbase	4 ft. 6 in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	10 ft. 0 in.
Window post spacing	31½ in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse, P.V. valve, straight air
Armature bearings	Plain brass
Axles	4½ in.
Car signal system	Consolidated interrupter unit
Compressors	Westinghouse A-4
Conduit	Flexible loom
Control	General Electric K-35-JJ
Door mechanism	National Pneumatic
Doors	Folding
Fare boxes	Cleveland
Finish	Duco
Floor covering	¼-in. battleship Congoleum
Gears and pinions	Tool Steel
Glass	Libby Owen D.S.B.
Hand brakes	Pittsburgh No. 35 drop handle
Heaters	Consolidated Car Heating Company
Headlights	9-in. Golden Glow
Headlining	¼-in. Agasote
Interior trim	Statuary bronze
Journal bearings	Plain 4 in. x 7 in.
Journal boxes	3½ in. x 7 in.
Lamp fixtures	Electric Service Supplies, safety car
Motors	Four Westinghouse 101-B, outside hung
Painting scheme	Orange
Roof material, Yellow poplar ⅛-in. No. 8 16-oz. canvas	
Safety car devices	National Pneumatic, treadle door
Sash fixtures	American Car Company
Seats	Brill No. 110, bus type
Seat spacing	28 in.
Seating material	Eagle Ottawa Leather Company, taxi brown leather
Slack adjusters	Westinghouse form E, type K
Steps	National Pneumatic folding
Step treads	Kass safety
Trolley catchers	Electric Service Supplies Company
Trolley base	Ohio Brass Company
Trolley wheels	More-Jones
Trucks	St. Louis
Ventilators	Railway Utility
Wheels	Cast iron, 33 in. diameter
Wheelguards	Spring steel, auto type, 1½ in. x ¼ in.

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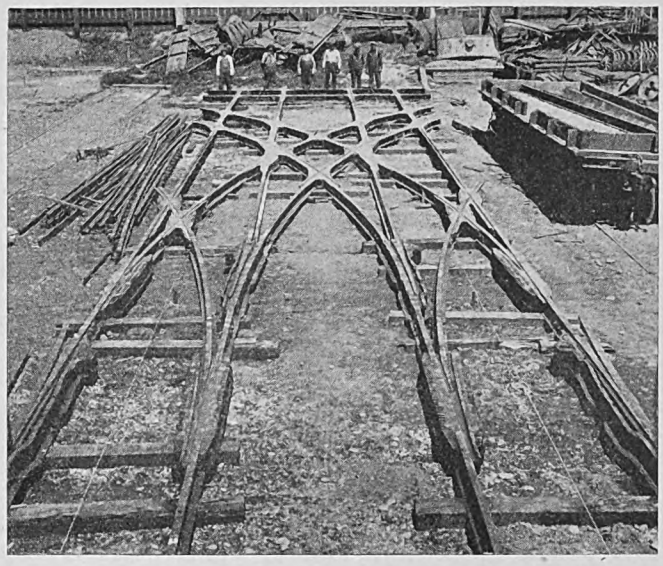
under-rigging black, is the color scheme for the exterior of the cars.

The trailer bodies were received from the factory fully equipped, with the exception of glass in the lower sash, and placed on trucks which were remodeled, considerably lightened, and equipped with 26-in. wheels. This work was done in the company's shops. The seating capacity of these center entrance-exit cars is 56 passengers each. They also are of the arch roof type with ten Brill standard exhaust ventilators. Battleship linoleum, new Brill leather-upholstered seats, complete with 8-in. semi-circular lounges seating six persons in each end, aluminum grab handles, combination hand and air-operated doors, No. 10 Tomlinson couplers, brown colored glass in upper sash, Schechter window post casings and Oskelite stop signal light system on rear comprise the equipment of these units, which are 40 ft. 9 in. x 8 ft. 4 in. Exterior and interior trimming are the same for the trail cars as for the motor cars, except that the monogram is omitted from the side panels. These trailers will be hauled by the "720 series" single-end treadle cars equipped with GE-275 60-hp. air-cooled motors mounted on St. Louis trucks equipped with 28-in. wheels, and they will be used on heavy-duty lines during peak hours.

Parade Introduces New Cars

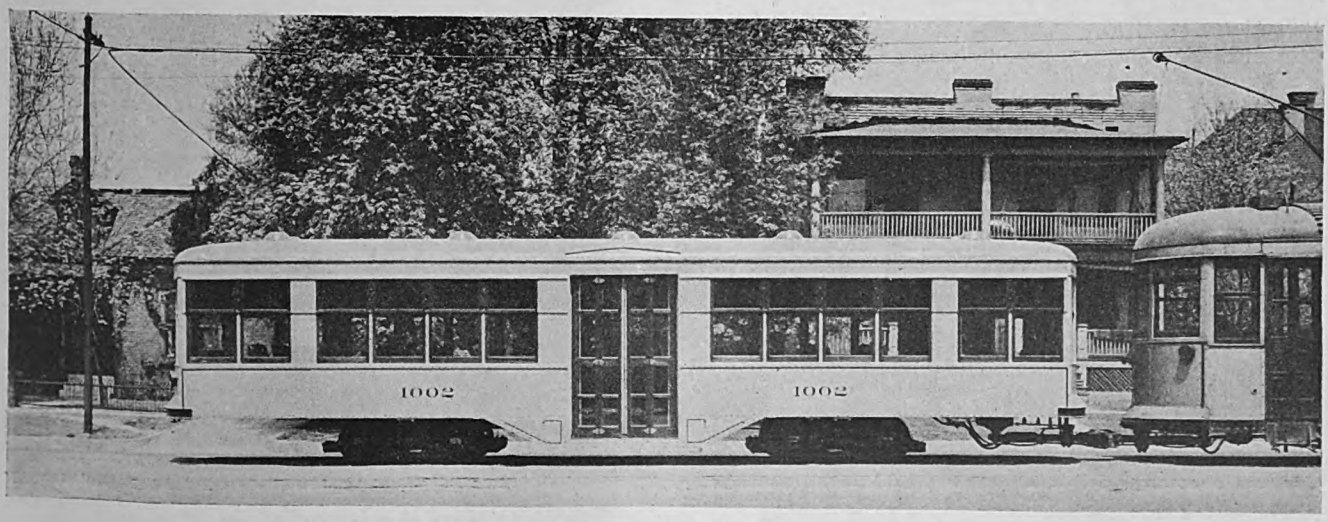
As an evidence of the public's interest and appreciation, Clarence C. Neslen, Mayor of Salt Lake City, consented to pilot one of the new cars on its maiden trip through the business district when the company on Saturday, April 30, staged a thirteen-car parade. This pageant of old and new transportation was headed by a rebuilt electric locomotive (described in the April 15 issue of the Journal) hauling two flat cars—one carrying the trainmen's band, the other a relic of bygone days, an old horse car; the latter followed by other passenger equipment in the order of its modernness, and a "720 class" car with new trailer and the new motor car bringing up the rear. Invitations were sent to the city commissioners, members of the Public Utility Commission, manufacturers' agents and others inviting them to inspect the new cars at the carhouse beforehand and to participate in the parade as passengers. As a further attraction a trainman attired in the garb of an early day "muleskinner" occupied the old horse car, and girls from the offices of the company and members of the company's ball team rode in the other cars. Following the parade the official party was conducted to the Newhouse Hotel, where luncheon was served.



One half of chrome-nickel special work that will be used at one of the busy intersections of Main Street, forming a part of the company's new plan for reconstructing track and roadway

Among the speakers on this occasion were E. O. Howard, president of the company, who as toastmaster called upon Mayor Neslen; T. E. McKay, Commissioner of the Public Utilities Commission; Julian Bamberger, president of the Bamberger Electric Railroad Company, and D. Morris Young, who, incidentally, drove a horse car in Salt Lake City in 1875. Mr. Young is the son of the late Brigham Young, Mormon pioneer leader. Both the Mayor and Commissioner McKay officially expressed their appreciation of the company's efforts to improve track, rolling stock and service, all of which is indicative of the fair and co-operative attitude and warm relations that exist between public officials and the street railway interests in Salt Lake City.

Incidentally, another phase of the company's rehabilitation program dealing with the right-of-way reconstruction and repairs, requiring an expenditure of $350,000 this year alone, was outlined by Mr. Howard. The various locations in the city and nature of the work in progress were described. Reconstruction, welding joints, inclosing track in pavement or repairing pavement are



Center-entrance trailers facilitate handling heavy loads

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now under way on about 6 miles of the track of the system, some 14 miles having been worked over last year.

On the job completed last year and under way this season Elastite was used between the rails and the abutting street surface to decrease the effect of frost action. This is made to fit snugly against the web of the rail, and as a result of its contraction and expansion qualities water seepage and freezing are reduced to a minimum. Locally manufactured concrete slabs 1 ft. x 4 ft. x 3¾ in. are used alongside the Elastite opposite the rail on practically all pavement repair jobs. They have proved very satisfactory not only because their weight prevents their being kicked out of place when loosened but also because they do not chip readily and can be reset at small expense. In addition to the concrete slab and Elastite, the company is using on all reconstruction jobs this year the ties of the Dayton Mechanical Tie Company and the International Steel Tie Company. Later in the summer the company plans to open up one of the downtown sections and to replace the special work with the chrome-nickel-steel layout shown in the accompanying illustration and to inclose the rails and resurface the intersections with concrete. The following summer another intersection will be opened, and so on until those over which operation is most frequent are replaced and resurfaced.

Another Safety Slogan Contest in Rochester

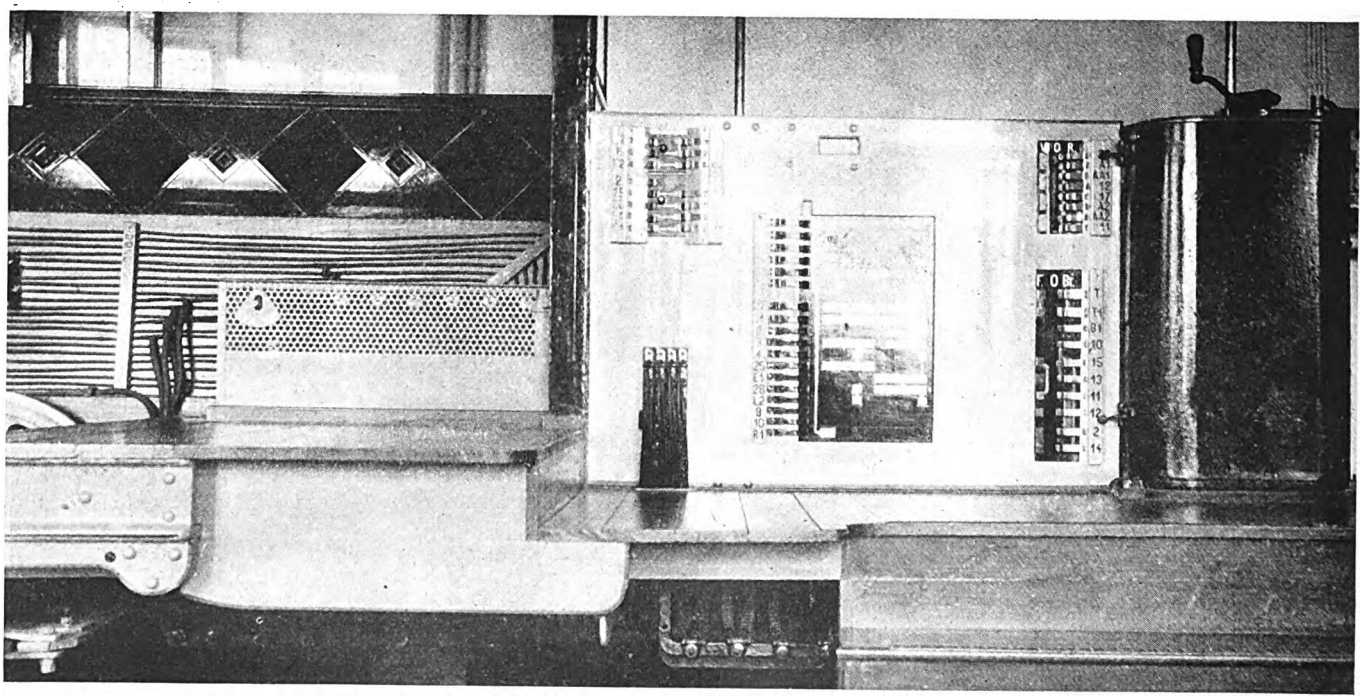
CASH awards of $40 are again being offered by the Rochester Safety Council, Rochester, N. Y., to citizens who can write safety slogans. Four slogans are needed and for the four best selected by the Safety Council separate prizes of $10 each will be awarded. The slogans, which must not exceed seven words, are to be used on street bulletin boards in 65 communities in the United States. Any person may submit as many slogans as he or she wishes. The Rochester second annual safety slogan contest will end officially on Sept. 30.

Last year the Rochester Safety Council received 461 slogans. This time the four months of January, February, March and April, 1928, have been selected as Rochester's months. During the first quarter of the next year the slogans selected will be sent throughout the United States, as was the case this year, when Rochester chose slogans for the entire country to be used during May, June, July and August.

Developed Controller for Schoolrooms

STUDENT motormen of the Hamburg Surface Lines, Hamburg, Germany, are trained in a well-equipped schoolroom. A novel method is used for illustrating the controller connections. Usually the student has to learn these from looking at a diagram or from inspection of the cylindrical controller itself. In Hamburg, however, the developed periphery of the controller cylinder has been reproduced on a sheet of black canvas with the segments painted on it in bright yellow paint. The reversing cylinder and braking cylinder have been treated in a similar way, and all have been mounted so as to move horizontally in a large wooden frame. At the sides of each opening are representations of the controller fingers, which are numbered in the proper order, as seen in the illustration.

As the handle of the adjoining real controller is turned forward the representation of the controller surface moves from right to left, and it moves in the reverse direction when the controller is turned off. It has been found that as these connections are on a flat surface the student follows them much more easily than if he had to get his only idea of them from a controller cylinder. The company also has a well-equipped schoolroom for its student bus operators.



Controller connections have been developed on a plane surface, mounted in a frame, for the benefit of student motormen on the Hamburg Surface Lines

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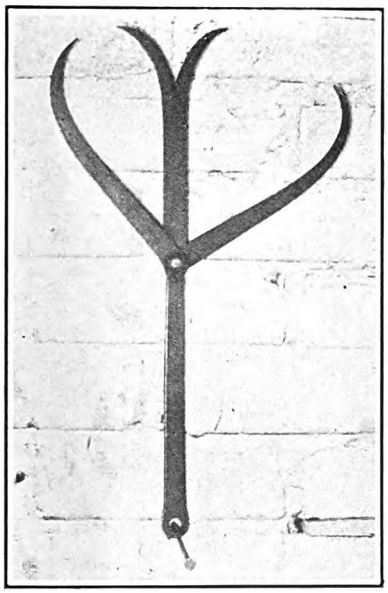
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MACHINE SHOP—2

Convenient Form of Double Calipers

FREQUENTLY it is necessary for a shop man to measure two different sizes in connection with machining operations to secure an accurate fit. Common cases of this are the two axle diameters for axle bearing fits, journal bearing diameters and the two armature bearing diameters. For such conditions machinists in the shops of the Grand Rapids Railway, Grand Rapids, Mich., have found it convenient to use a double caliper of the type illustrated. With this it is unnecessary to lay down one set of calipers and take up another in order to measure two different diameters.



Form of double caliper used in the shops of the Grand Rapids Railway

The double calipers consist of a single center section with the bottom split and bent out so as to form the stationary jaws. To this center section are riveted two movable arms arranged to line up with the stationary points. Through the use of this type of double caliper much time is saved in machining operations.

Electric Railway Journal Maintenance Data Sheet

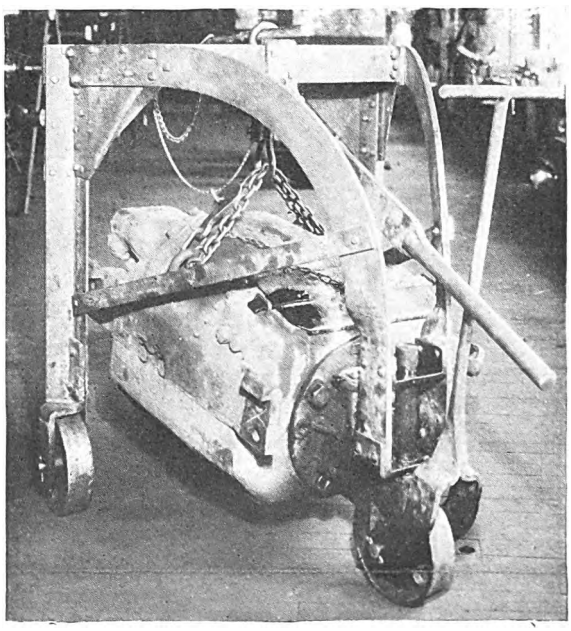
ROLLING STOCK—ELECTRICAL—19

Lifting Buggy Is Handy for Moving Motors

CAR motors are transported from place to place in the Grand Avenue shops of the Connecticut Company with increased facility by the use of a three-wheel buggy equipped with its own lifting device. The apparatus was designed by J. E. Dooley, master mechanic, and built in the railway shops. The end of the buggy is rectangular with two 3½-in.x3½-in.x⅝-in. angles for uprights and a 4-in.x½-in. steel member across the top. Each upright has at its lower end a 10-in. wheel mounted on a 1½-in. axle. The two sides of the apparatus, each having the general shape of a quarter circle, join at the bottom, where a third wheel is located. A handle for pulling the truck is attached to the axle of this wheel.

Over-all height of the buggy is 48 in. Its width is 43 in. and its length is 35 in.

A lever arrangement with hook and chain is employed to lift and carry the motor. The fulcrum of this lever is a horizontal member parallel to the top member of the end frame. Chains pass through the hoist loops of the motor frame and over a hook on the short, or 5-in. arm of the lever. The other arm, including a sleeve, is 50 in. long, making the lever ratio ten to one. Hence two men having a combined weight of about 300 lb. can raise a motor weighing 3,000 lb. After the motor has been raised clear of the ground, a pin is inserted above the two transverse members through a ring on the upper side of short lever arm. Pressure can then be released on the long arm while the motor remains suspended.



Buggy used in the Grand Avenue shops of the Connecticut Company, New Haven, to lift and carry car motors

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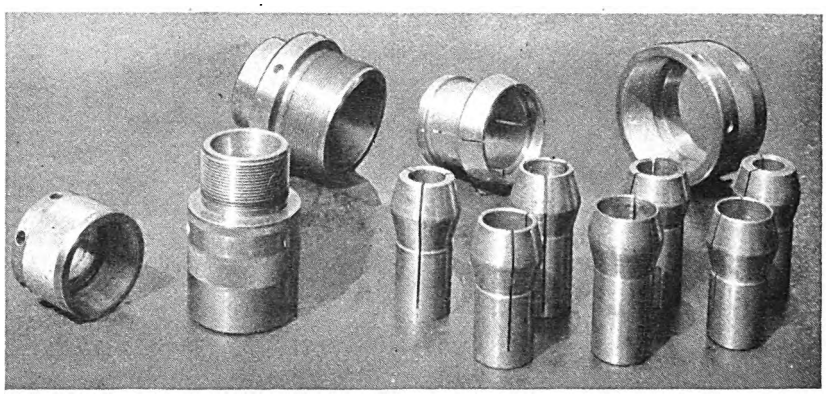
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MACHINE SHOP—3

Spring-Collet Chucks Center Work Quickly

FOR holding bar stock or any other cylindrical material different sizes of spring-collet chucks are used in the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation. An accompanying illustration shows a number of these. The three parts of a large chuck are shown in the background of this illustration and the body portion at the left. This is provided with a female thread at one end which screws on to the lathe spindle. The second part, shown in the center, slides into the body portion and has slots to provide a spring clamping action. The end of this second section and the third part have corresponding tapers which bear on each other when the two parts are screwed together, so that they press firmly and hold the material to be machined. This action provides a perfectly central position for the work and thus makes unnecessary any truing or adjusting.

To accommodate different sizes of stock these collet chucks are made up in sizes varying by $\frac{1}{8}$ in. from 3 in. to $1\frac{1}{4}$ in. In the front part of the accompanying illustration will be seen seven of the No. 2 parts of the chuck, all of which fit into the same master body and are clamped with the same master end piece. These two parts are shown at the left. The use of these spring-collet chucks saves much time on jobs that would otherwise be very expensive.



Spring-collet chucks center work accurately and save machinist's time

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—20

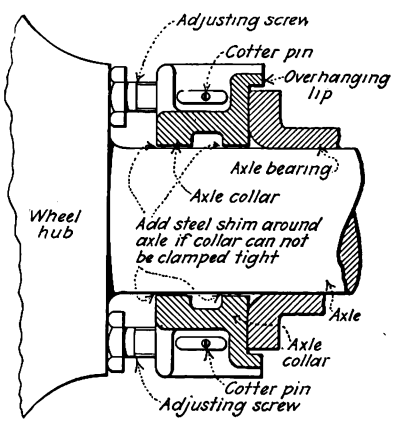
Preventing Breakage of Axle Collar Adjusting Bolts

By P. A. Pontius
Renewal Parts Engineer Westinghouse
Electric & Manufacturing Company

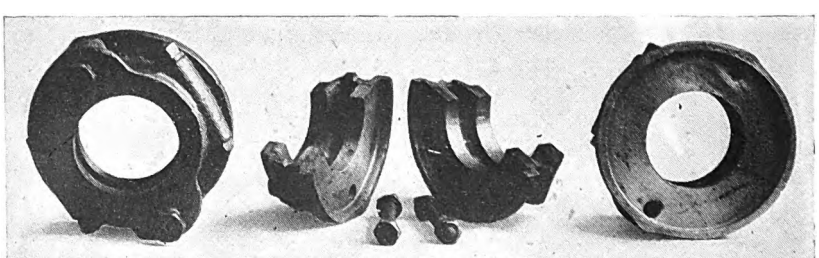
BREAKAGE of adjusting bolts on axle collars can be overcome easily by keeping the axle collars tight around the axle. The axle collar should revolve simultaneously with the axle and wheel hub. This will prevent all twisting strain on the bolts and they will be under compression strain only if sufficient attention is paid to this point. Loose axle collars can be found readily by checking if the heads of the adjusting bolts have wiped the dirt off the wheel hub.

Sheet steel shims should be placed around the axle in case the diameter of the axle is too small. Shims should also be used if the bore of the collar is oversize such that the collar cannot be clamped tight to the axle. Cardboard paper, sandpaper or other compressive materials or soft metals should not be used.

Axle collars are received from the factory with shims in the split; that is, between the two halves. These shims should be removed before clamping the collar around the axle in order to insure a tight fit on a standard size axle.



The space between the wheel hub and the heavy flange should be filled by the collar



Shims should be removed from the split before clamping

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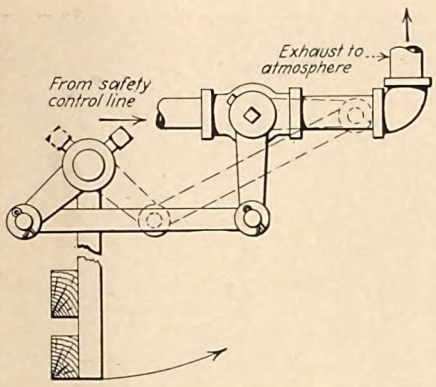
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—5

Safety Device Operated by Life Guard

DANGER that falling life guards will become entangled under a car or come up through the floor and cause injury is being overcome on cars of the South Carolina Power Company, Charleston, S. C., by the installation of a device originated by the master mechanic, W. S. Lee.

A lever has been mounted on the iron rod at the top of the trip gate. When this gate of a H-B life guard strikes an obstacle on the street it is deflected backward and so rotates about the iron rod at the top. The new lever installed on this rod operates a valve which exhausts air from a safety device control air line. When air is exhausted from this safety air line power is automatically shut off from the car, sand is applied to the tracks and the brakes go into emergency.

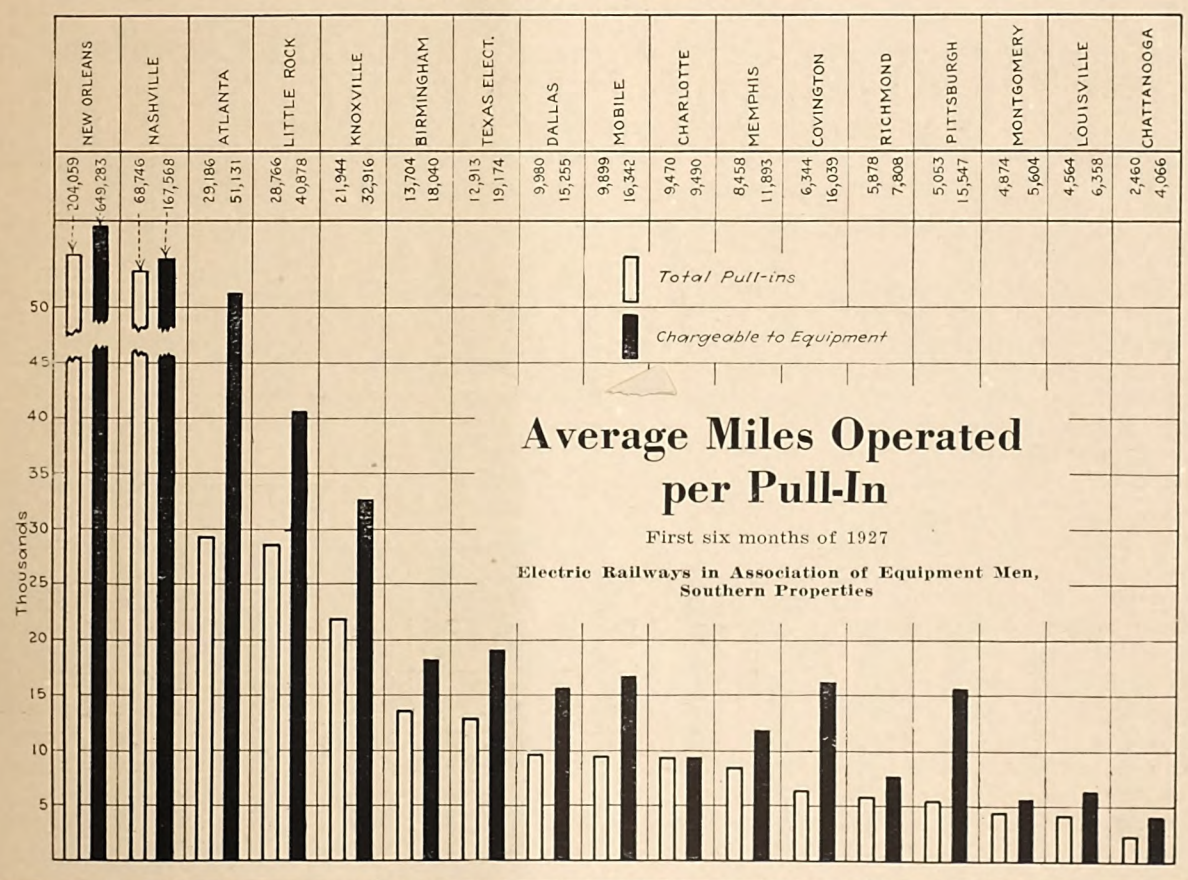


Connections for operating safety devices on cars of the South Carolina Power Company

This equipment serves a double purpose. First, it acts as a safety device in case of collision, and, second, it reduces the damage to life guards which may be dropped accidentally. If a motorman for any reason should become confused the tripping of the life guard by a person or obstacle on the tracks will stop the car at once. This is also of advantage to attorneys in making certain that a car is handled correctly. From a maintenance standpoint it is thought this device will save life guards and flooring and so reduce expenses.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—7



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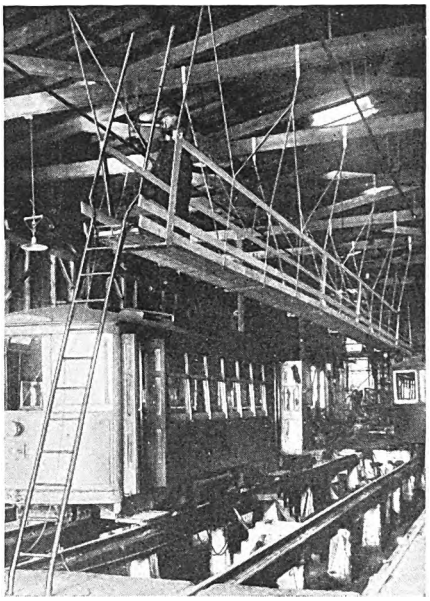
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—6

Platform for Trolley Wheel Maintenance

IN ORDER to facilitate inspection of trolley wheels and prevent accidents in the Lexington shop of the Kentucky Traction & Terminal Company, W. G. Stuck, superintendent of equipment, has designed and erected a suspended platform along the pit track.

This platform is located at such a height as to provide ample clearance for passing cars. It is 64 ft. long, 24 in. wide at the footboard and is suspended from the carhouse rafters by six ⅜-in. x 2-ft. flat steel brackets. A guard rail made of 1½-in. x 3½-in. pine is placed 46½ in. above the footboard on each side and extends the entire length of the platform. In order to increase the strength of the platform a ⅜-in. x 2-in. angle is bent around the platform from guard rail to guard rail and from the first, third, fourth and sixth suspension brackets. Two ⅜-in. x 2-in. cross braces between each pair of suspension brackets on either side are connected through ½-in. bolts to a bar of ⅜-in. x 2-in. flat steel installed under the platform footboard. This further increases the strength.



Suspended platform along pit track

A ladder, hinged at the end of the platform, provides easy access. It is 14½ in. wide. The side frames are 1¼-in. iron pipe, and the rungs are ½-in. round steel welded to the sides and spaced on 12-in. centers. When not in use it can be swung up out of the way.

With this platform accidents caused by slipping of ladders or falls from the car roof during inspection process have disappeared. It also has speeded up the inspection and improved its quality.

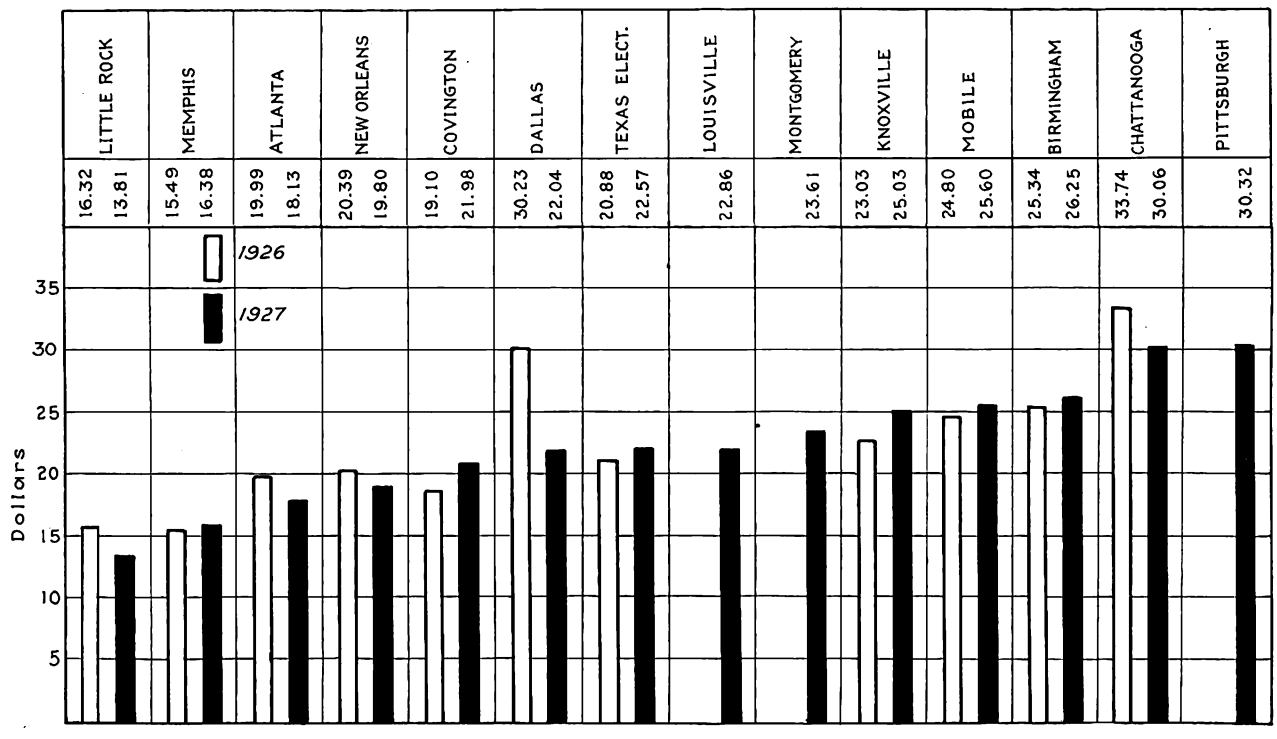
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—8

Maintenance Cost of Equipment per 1,000 Car-Miles

For year 1926 and first five months of 1927

Electric Railways in Association of Equipment Men, Southern Properties



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Association Activities

Southern Equipment Meeting Attracts Wide Attention

Executives and maintenance men from properties outside the southern territory attended Atlanta meeting. As result of good work being done, membership has grown to nineteen properties

SUBJECTS covering almost the entire range of electric railway equipment maintenance crowded a three-day session of the Electric Railway Association of Equipment Men, Southern Properties, held in Atlanta, July 27, 28 and 29. This was the twelfth semi-annual meeting of the association, which in a period of six years has grown in membership from four to nineteen properties. Attendance during the meetings numbered approximately 200 and included representatives from Pittsburgh, Baltimore, Cincinnati, St. Louis and other cities beyond the limits of the southern territory in which the association was originally organized. In addition to equipment maintenance men, there were present a number of executives who were attracted by the wide scope of the program and the lively discussion of subjects vital to the prosperity and progress of the industry.

W. S. Arkwright Makes Address

The high spot of the meeting was marked by an address at the dinner on Thursday evening, made by W. S. Arkwright, president Georgia Power Company. "Maintenance men in the electric railway industry have had serious limitations both in their conception of their jobs and in their performance," he said, "but the primary responsibility for past and present shortcomings lies not with them; it rests on the shoulders of those who control the policies of electric railway properties; those charged with the financial and management responsibility, who have dictated the conditions under which the maintenance man has been required to function.

"In a period of 25 years we electric railway executives have made every mistake that it was possible to make in the management of a transportation business. The troubles of the industry are our fault and not that of the public. We started out to run a cheap business and we conducted it as such. The rate of pay for our men was the lowest in town and the hours of work were the longest. A job on the platform of a street car was the last job in town.

"In those days the fare was 5 cents. The cars were cheap little vehicles running on a light strap of iron in the street. The floor was covered with straw to keep passengers' feet from freezing. It was a cheap service rendered by cheap men in cheap cars—and it didn't go very far. Since that time we have extended the service enormously. We have increased the size of cars and at the same time every element of cost both in operation and maintenance has increased many fold. But we have attempted to keep the service cheap. We have attempted to meet the rising cost of operation by parsimonious economies. We have failed entirely to do our part in frankly meeting changed conditions by keeping our service in tune with the times and by giving our public an opportunity to buy at a fair price the kind of service they are entitled to have and are willing to pay for, once they are given a fair opportunity of understanding the situation and expressing their preferences."

Vicious Cycle Started

Mr. Arkwright went on to point out how the vicious cycle of deferring maintenance and of letting equipment and service deteriorate was established as revenues began to fall off with the coming of the automobile. He painted a vivid picture of the situation which was permitted to grow as deteriorated service and the attractiveness of the automobile formed a cumulative cycle which took more and more people off the street cars. Only two or three years ago, he explained, did the industry begin to wake up. Only then did it begin to pay some attention to the relation between the character of its cars and revenues which could be expected. Only recently has it begun to substitute intelligent action for excuses. "Today," he said, "we're beginning to make our business one not to be ashamed of. We're beginning to make it one that we've got a right to be fairly paid for. Even when we seriously started to adjust our fares to meet the changed operating costs of today, we took ten bites at the cherry instead of one—we went at it one-half of a cent at a time. The salvation of the electric railways lies in first providing a decent service that will meet the requirements of present-day conditions, and then openly asking a fair price for that service which will enable us to keep it up to date. Our cars ought to be better each year, and our fares should be on a basis that will permit us to offer the public the benefit of the improvements from year to year that may be expected in car design and equipment."

Papers Cover Many Topics

The collection and analysis of service data for making railway motor applications was the subject of a paper by A. J. Naquin, engineer of rolling stock and shops New Orleans Public Service, Inc. T. E. Alderdice, superintendent of maintenance Pittsburgh Railways, outlined the methods used on that property for establishing car maintenance on a production basis. D. F. Smith of the railway motor equipment division General Electric Company discussed some of the difficulties encountered in railway motor design and manufacture. A talk on the application of worm drive axles to electric railway cars, illustrated with lantern slides, was made by N. R. Brownyer, engineer railway department Timken Detroit Axle Company. The abc.'s of good equipment maintenance practice were covered in a paper by J. S. Dean, renewal parts engineer Westinghouse Electric & Manufacturing Company. The mechanical department's part in building good public relations was portrayed in a paper by C. J. Crampton, manager of public relations, Dallas Railway & Terminal Company. Two papers were delivered on the general subject of car cleaning and painting; one by D. H. Bell, supervisor of overhaul Pittsburgh Railways, discussed the use of lacquer finish for street cars. The other by L. A. Sargent, master mechanic Tampa Elec-

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Aug. 18-19*—Wisconsin Utilities Association, Transportation Section, annual convention, Hotel Pfister, Milwaukee, Wis.**

***Sept. 1-3*— National Electrical Manufacturers Association, Policies Division, meeting, Association Island, N. Y.**

***Sept. 1-4*—Tenth Annual Conference on Human Relations in Industry, Silver Bay on Lake George, N. Y.**

***Sept. 7-9*—American Society of Mechanical Engineers, Machine Shop Practice Division, first national meeting, Mason Laboratory, Yale University, New Haven, Conn.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, South Bend, Ind.**

***Sept. 13-15*— International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting. Book-Cadillac Hotel, Detroit, Mich.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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tric Company, presented the experience of that property in the use of wax as a protective coating for the exterior of cars. Some of the troubles encountered in the maintenance of safety car equipment were outlined by J. R. Troutman, foreman Knoxville Power & Light Company.

Lively Discussion on Question Box

In addition to the prepared papers on the program, frank discussion of some 28 maintenance questions that had been sent in by members furnished the basis for a very lively discussion, which is one of the features of this association's meetings. Inspection trips were also made to the various properties of the Georgia Power Company. One evening trip was made to the car shop to inspect the unusually brilliant artificial illumination which is provided there. An abstract of the paper by Mr. Sargent is published elsewhere in this issue. Those by Messrs. Bell and Alderdice will be published next week.

Mr. Naquin's paper on the collection and compilation of service data for making railway motor applications was illustrated with forms and diagrams to show the method used by the New Orleans company for putting this data in form available for use. The importance of accurate service data for the proper application of motor equipment was stressed. The speaker also pointed out the usefulness of such data in making and checking operating schedules. A word of caution was sounded against accepting only the thermal and energy consumption characteristics of a motor in determining its suitability for a given class of service. The physical aspects, such as size of bearings and proper clearances, were considered equally important in selecting motor equipment.

Operating companies were urged to provide the necessary training for one or more men so as to fit them for intelligent co-operation in the selection of motor equipment. The speaker said that the electrical manufacturing companies show a keen desire to co-operate fully with an operating company in checking the suitability of motor equipment for specific kinds of service.

In the discussion of this subject, J. C. Thirlwall of the General Electric Company, called attention to the tendency toward a more conservative thermal rating for modern light-weight, high-speed, ventilated motors, in comparison with the heavier, slower speed, unventilated machines formerly used. The demand for increased rates of acceleration and the severity of modern schedule requirements under congested traffic conditions, combined with the tendency toward light weight and high speed, have brought about a situation in which mechanical limitations largely determine motor applications. Under these conditions thermal rating becomes a secondary rather than a primary consideration, according to Mr. Thirlwall. The most important limiting factors in present-day motor selections are ability to commutate at the rates of acceleration required, and mechanical limitations.

Modern Design Increases Manufacturing Difficulty

In his paper on problems encountered in the manufacture of electric railway motors, D. F. Smith of the General Electric Company said that the outstanding difference between the service to which a railway motor is applied and that of other types of electric motors is vibration. Due to being mounted rigidly on the axles, these motors get direct blows and shocks attributable to irregularities in the rails. Added to these is the constant high frequency vibration set up by the gearing. The combination of these destructive forces is the indirect cause of a great majority of motor failures, according to the speaker. Frames crack, caps loosen, bearings fail, coils loosen, leads break, cables become grounded, brush-holders loosen and lock washers refuse to hold. The limtations that exist as to permissible size and weight offer an obstacle to overcoming all of these troubles.

After enumerating a number of the difficulties encountered in motor design and manufacture, Mr. Smith said that the manufacturers are making an effort to produce a motor that will meet the service requirements imposed by modern conditions. Regarding the maintenance of this equipment, he suggested that the manufacturer's first request is periodic inspection with the correction of small troubles before serious abuse of the motor has occurred. According to the speaker, the most important maintenance operation which eliminates trouble is the tightening of loose parts. This applies as well to the winding, both field and armature, as to the various bolts and nuts.

Worm Drive Axle Progress Outlined

In his address on the development of worm drive axles for electric railway cars, N. R. Brownyer of the Timken Detroit Axle Company explained that gears are usually the worst offenders, so far as noise is concerned, on a moving vehicle like a street car. The inherent silence of worm gearing therefore offered one of its outstanding advantages for street car propulsion. The speaker said that worm gearing is not only silent when operating under even torque, but is free from the knocking that is so common in other forms of gearing due to torque reversal. He explained that the worm gear, regardless of tooth back lash, does not tend to chatter or knock. This was attributed to the large areas of contact, low resonant quality of the worm wheel material and obliquity of the two contacts resulting from the use of high lead angles.

The present day worm-drive axle for automotive vehicles, Mr. Brownyer explained, with its one piece oil tight and dust proof housing, is a product of years of experience and patient analysis. With this experimental and research background it was decided to adapt the principles thus developed in the automotive field to the electric railway field, with such changes in proportion as were necessary to insure successful operation on steel rails. Unlike all other forms of gearing, a worm gear set becomes more efficient in use, according to the speaker. The chief reason advanced for this is that the worm wheel is generated by a cutter that is the shape of the worm itself. Consequently when the hardened, ground and polished surfaces of the worm teeth make contact with the special alloy bronze worm wheel teeth, a continuation of the generating process is carried on. In other words, any minute errors in cutting the teeth of the worm wheels are gradually corrected as the gearing grows older in service.

In the discussion of slides illustrating the construction of the axles and trucks used on the experimental cars for the Chicago & Joliet Electric Railway and the Springfield Street Railway, Mr. Brownyer predicted that the internal form of expanding brake applied on these axles would give a splendid account of itself in electric railway service. He based this on the low adhesion of steel wheels to the rail and the comparatively low weight carried on each axle in comparison with heavy duty automotive vehicles. In addition, he explained that the use of small wheels and large brake diameters produce a combination of conditions much less severe than that encountered on motor buses. Regarding the use of a differential in the axle, the speaker predicted that it would tend to eliminate the noise produced on curves from slipping wheels. He also said that the manufacturer expected that the use of a differential would result in decreased flange wear and track wear on sharp city curves.

A number of slides were shown to illustrate the general features of the axle and truck construction used on the experimental cars. In answer to questions, Mr. Brownyer explained that the worm design permitted the use of gear reductions as high as 12 to 1 without producing lead angles which would interfere with the free coasting of cars. Regarding the relative efficiency of worm gearing and spur gearing sets throughout their entire life, he said that there was apparently little difference in the net result and that exhaustive tests on several high grade automobiles had shown efficiencies very slightly in favor of the worm drive. According to the speaker, axles of this type have been designed for cars having a total weight of 40,000 lb. Removal of the motors from the axle and the consequent feasibility of increasing the motor speed and reducing size and weight materially were held to be major advantages of the worm drive construction.

Under the title of "The abc's of Equipment Maintenance," J. F. Dean, renewal parts engineer Westinghouse Electric & Manufacturing Company, presented an exhaustive review of the best modern maintenance practices as compiled from the experience of a great many operating properties over a wide

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range of conditions. Since Mr. Dean's paper was too long to be read in its entirety, he presented in outline only some of the high spots of improved maintenance practice contained in the paper. It was suggested by President W. H. McAloney that each member take this paper home for discussion with his individual staff and for a guide in analyzing his own practices. Considerable discussion ensued regarding various points mentioned in Mr. Dean's paper, particularly as regards various features of armature and motor maintenance practice.

Maintenance Men Affect Public Opinion

In the absence of C. J. Crampton, manager of public relations Dallas Railway & Terminal Company, his paper on the mechanical department's part in good public relations was presented by H. J. Beadle of Mr. Crampton's company. Emphasis was placed on the fact that all departments of the street railway must function for better public relations if the aggregate effect desired by the property is to be brought about. Since service is the backbone of good public relations, the mechanical department occupies a most important position along with the maintenance of way department, as they both furnish the foundation for good service.

According to the speaker, too much stress cannot be placed on the importance of good equipment well maintained. People are attracted by well-painted, clean cars. The environment produced by the character and condition of the cars on a property attracts or repels patrons. Regarding color combinations, a note of caution was sounded on the use of gaudy circus-like painting schemes. Mr. Crampton held that the human mind questions anything that too far departs from its accustomed standards and that after the novelty has worn off, the public soon tires of the tawdry substitute for ordinary good taste which is represented by extreme color schemes.

One feature of the mechanical department's public relations work was particularly stressed. This referred to the use of the department's personnel to improve public good will for the company. A company is known by its employees, according to Mr. Crampton. If they are good citizens who bear their part of the civic responsibility, are friendly with their neighbors, congenial, helpful and pay their bills promptly, the community clothes their employer, the transportation company, with their characteristics. Employees, he said, must be impressed with their duty of representing their company properly. They must be acquainted with company policies and schooled in its methods, not only as to their particular job but in the larger company relationships. They must feel that they are being treated fairly and are given every opportunity to make the most of their jobs. In summarizing, the speaker said that the cornerstone of public utility success is favorable public opinion, which in turn is gained by good service, pleasingly rendered and by the public's appraisal of individual conduct in public and private affairs.

In the discussion of the subject of car improvement, there was considerable difference of opinion regarding the proper types of painting and the use of de luxe seats in city cars. A. H. Leschke of the Pittsburgh Railways described and discussed the new de luxe car which is being tried out in that city with the seats arranged at an angle of 45 deg. and designed to provide maximum comfort to passengers. Serious attention is being given to this subject as the result of the experience obtained.

A discussion of maintenance problems in the operation of safety cars was presented in the paper by J. R. Troutman, inspection foreman Knoxville Power & Light Company. He emphasized the advantages of the interlock between the doors and the air brakes, pointing out the advantages of this form over the former type of interlock with the controllers. As the result of experience with safety car equipment, the speaker made the following recommendations regarding maintenance practice to insure proper functioning of these devices: Clean strainer air and valves once every six months; completely overhaul all valves, including compressor and governors, every eighteen months; clean compressor and renew oil every six months; clean brake cylinders once a year; inspect all parts of the equipment once a week; check governor rings every three months.

Dry Cleaning Street Cars*

By L. A. Sargent
Master Mechanic Tampa Electric Company

During the past few years electric railway companies have given great thought to the cleanliness and general appearance of street cars, both as to exterior and interior, realizing these to be very important factors, in improving service, promoting better public relations and thereby increasing revenues. To this end a greater effort is being made today than formerly to keep equipment in better condition as regards cleaning, sweeping and painting. There exists among the various companies, however, a wide variance in the methods used to keep the equipment looking clean.

In Tampa we are fortunate in that the soil is not black and sticky, but sandy. The air is not salty. It is inclined to be dry and fogs prevail for only a short time in the early morning during the winter months. Such conditions enable us to maintain a system of car cleaning that is simple to the extreme.

Four years ago in March we tried using Old English floor wax on the exterior of one of our street cars. The effect was astonishing and was the basis of immediate further study in that direction. Before a year passed we had experimented with several other cars, and during 1924 and 1925 we completed the waxing of all of our closed passenger cars. Since then it has been only a matter of routine waxing, catching cars which look dirty and which average about six months between waxings.

We are thoroughly sold on the principle of waxing cars. Its advantages are many, namely, it eliminates washing, more than doubles the life of paint, as well as the life of the car, and is quickly and easily cleaned.

The method of applying the wax is very simple, yet it must be done in a certain manner if good results are to be obtained. The higher the polish desired, the more care must be used in applying the wax. The simple analogy is in shining one's shoes; if the shoes are dirty they must be cleaned before the wax is applied. The same is true of street cars or automobiles; the surface must be cleaned before waxing. Paste wax can be evenly applied by folding some cheesecloth and placing a lump of wax the size of a hen's egg in the center, never letting the raw wax touch the surface being covered. Every inch of surface must be rubbed with wax, otherwise the result will be an uneven polish. After waxing the entire surface, the wax at the starting point will probably be hard enough to start rubbing for the polish. Ordinary cotton waste or soft rags can be used and will take one man from half an hour to one hour to rub a good polish. At first the wax leaves a greasy appearance on the car and it takes several wipings, with dust as the abrasive, to get entirely rid of this greasy effect. Our cars are yellow and do not show grease as plainly as darker finishes or highly polished automobiles and consequently one hour of polishing is usually sufficient.

For a single truck Birney car about ½ lb. of wax is required and for a double-truck car slightly more than 1 lb. Labor varies from two to four hours, according to whether the car has to be washed and dried before applying the wax. On our property only one man is employed to wax and wipe all cars, this labor being all the effort needed to keep the exterior—excepting windows which have to be cleaned with "Bon-Ami"—of our 121 closed passenger cars clean. Our present practice of waxing cars every six months amounts to about one car each workday and gives the man ample time to wax the car well, as well as time to wipe off all other cars which happen to be in the carhouse. It also gives him a little rest between waxings, for it's no boy's job to polish a waxed surface as large as a street car. But when the job is fin-

*Abstract of a paper presented at semi-annual meeting, Electric Railway Association of Equipment Men, Southern Properties, Atlanta, Ga., July 27-29.

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ished and you realize that the bright and glossy finish is there to stay from six months to a year—depending on the number of times it is wiped—you are proud of the car and the method used and wish that all of the cars were freshly waxed.

All of our wiping is done during the day when the air is dry. Every active car in the carhouse, either on a split-run or as hold-in, is wiped off daily. A check is kept, however, so that any one car will not run over five days without being wiped off. For this work we use a long handle mop, 16 in. wide, with a removable, washable head. With this equipment it requires a man less than two minutes to wipe off a standard single-truck Birney car, going over the entire exterior. If the window guards are screwed or bolted up and have to be undone before they can be dropped it will require longer to do this work. To those who have never rubbed waxed surfaces, the speed of this wiping operation may seem absurd, but is quite reasonable when you consider the part coefficient of friction plays.

For my own information, I have measured the coefficient of friction of enameled and lacquered surfaces before and after waxing. These tests were obtained by pressing a block covered with cheesecloth against the side of the various cars, using a pressure of 20 lb. and pulling the block along with a scale. The coefficients of friction found were as follows: Old Vitralite enamel, not waxed, 0.540; old Vitralite enamel, waxed, 0.344; lacquer surface, not waxed, 0.412; lacquer surface, waxed, 0.275.

These figures show that the effort of wiping an enameled car which has not been waxed is twice as great as that required to wipe a lacquered car which has been waxed. Varnished and enameled cars which have not been waxed do not wipe readily, as the dirt becomes imbedded in the surface and usually requires a washing to be really cleaned.

It is not always necessary to wax the entire surface of the street car, as the parts above the window sills do not get the hard wear the lower parts get and consequently the bottom or body of the car and the front dashes can be cleaned between regular waxings by using a little leptyne and wax on a piece of cotton waste. This removes the dirt and spots and does not injure the wax already on the car, yet adds just enough to make it polish.

Aside from the ease in wiping and the long periods between waxings, one of the outstanding advantages of waxing is the protection given to the paint surface. We know that oxygen in the air is the chief enemy of paint. Wax forms a film over the paint and if this film is maintained the paint cannot suffer except from scratches and bruises. This fact has proved itself in practice, as we are now painting cars on account of scratches and patches and not because the paint itself is worn off or the surface needs paint protection.

Even a greater factor is the elimination of much of the water formerly used on cars for washing.

Wisconsin Association Program

PROGRAM for the annual convention of the Transportation Section of the Wisconsin Utilities Association, to be held at the Hotel Pfister, Milwaukee, Wis., on Aug. 18 and 19, has been announced. The program follows:

Thursday Morning, Aug. 18

Registration at Hotel Pfister.

Address of chairman, Clyde L. Hedges, La Crosse, Wis.

"Speed with Safety at Lower Costs," by E. J. McIlraith, Chicago.

Announcements by Executive Secretary John N. Cadby of the Wisconsin Utilities Association.

"Speed with Safety in Spite of Traffic," by Thomas R. Tate, Milwaukee, Wis.

"Safety of Railway and Bus Operation," by Commissioner A. R. McDonald, Madison, Wis.

Thursday Afternoon

Inspection trips.

Thursday Evening

Annual banquet. Talks by W. H. Sawyer, president American Electric Railway Association, and Cornelius Corcoran, president City Council of Milwaukee.

Friday Morning, Aug. 19

Report on Accident Experience, by R. M. Howard, Winona, Minn.

"Increasing Co-ordination of Car and Bus for Greater Speed with Safety," a series of ten-minute talks by J. H. Lucas, J. R. Blackhall and Henry Cordell on design and F. M. Holaday on operation.

General discussion:

Fellowship report on "Noise Research," by Erwin Summers, University of Wisconsin, Madison.

Election of officers.

"Maintenance of Way Problems," ten-minute talks by E. J. Archambault, F. J. Kramer and A. A. Oldfield.

"Advertising and Selling Transportation," by Fred Eriksen, Milwaukee, Wis.

"Popularizing Safety Among Platform Men," by Chester K. Thomas, Chicago.

American Association News

Nominations for 1928

RECOMMENDATIONS by the nominating committee of names of officers of the American Electric Railway Association for 1928 has been announced as follows:

For President—R. P. Stevens, president Penn-Ohio Edison Company, New York, N. Y.

First Vice-President—J. P. Barnes, president Louisville Railway, Louisville, Ky.

Second Vice-President—Paul Shoup, president Pacific Electric Railway, San Francisco, Cal.

Third Vice-President—J. H. Hanna, president Capital Traction Company, Washington, D. C.

Fourth Vice-President—C. E. Morgan, vice-president and general manager Brooklyn City Railroad, Brooklyn, N. Y.

Treasurer—Barron Collier, president Barron G. Collier, Inc., New York, N. Y.

For operating and manufacturer members of the executive committee at large for the three-year terms expiring 1930:

Operating Members—J. H. Alexander, president Cleveland Railway, Cleveland, Ohio; D. W. Snyder, Jr., vice-president Illinois Traction System, Springfield, Ill.

Manufacturer Members—J. G. Barry, vice-president General Electric Company, Schenectady, N. Y.; W. F. Cutler, vice-president American Brake Shoe & Foundry Company and president Southern Wheel Company, New York, N. Y.; J. R. Fitzpatrick, vice-president Haskelite Manufacturing Corporation, Chicago, Ill.

Twelve Railways Compete for Coffin Award

BRIEFS in competition for the 1927 Charles A. Coffin award were received at American Electric Railway Association headquarters, New York City, from twelve companies on or before Aug. 1. The entrants are as follows:

Birmingham Electric Company, Birmingham, Ala.

El Paso Electric Company, El Paso, Tex.

Northern Texas Traction Company, Fort Worth, Tex.

Georgia Power Company, Atlanta, Ga.

Little Rock Street Railway of the Arkansas Power & Light Company, Little Rock, Ark.

Chicago Surface Lines, Chicago, Ill.

Virginia Electric & Power Company, Richmond, Va.

Grand Rapids Railway, Grand Rapids, Mich.

Southern Colorado Power Company, Pueblo, Col.

United Railways of St. Louis, St. Louis, Mo.

Chicago, South Shore & South Bend Railroad, Chicago, Ill.

Durham Public Service Company, Durham, N. C.

Foreman Conference Registrants

AS THIS issue of the JOURNAL goes to press the following registrations have been received at American Association headquarters for the training course for foreman-conference leaders at Cleveland, Oct. 3 to 8:

Ernest Cox, Chicago North Shore & Milwaukee Railroad.

Homer Free, carhouse foreman Louisville Railway.

Jos. A. Griffin, supervisor Boston Elevated Railway.

Rudolph Kundert, machine-shop foreman Boston Elevated Railway.

James L. Lovitt, director of training and education Philadelphia Rapid Transit Company.

Henry H. Norris, educational adviser Boston Elevated Railway.

W. I. Ray, chief motor inspector Louisville Railway.

A. J. Rowland, educational director Milwaukee Electric Railway & Light Company.

A. J. Sarré, New Orleans Public Service, Inc.

H. W. Saul, educational director Edison Electric Illuminating Company of Boston.

A. C. Stukens, master mechanic Dayton & Western Traction Company.

C. K. Thomas, Chicago, North Shore & Milwaukee Railroad.

The Houston Electric Company will also send a representative and there will be additional representatives from at least two of the companies mentioned above.

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News of the Industry

Fare Increase Wanted

Company operating in Baltimore asks for advance to ten cents, with temporary increase effective at once

THE United Railways & Electric Company, Baltimore, has applied to the Maryland Public Service Commission to be permitted to increase the fare to 10 cents flat, with a substantial increase immediately as a temporary emergency pending establishment of the 10-cent rate. The present fare in Baltimore is 7½ cents. It has been in effect since 1924.

In a statement made by Charles D. Emmons, president of the company, it is said that the 10-cent fare would enable the company to earn this year only what has been deemed by the commission as a fair return.

A table of net income filed with the application shows some marked decreases.

NET INCOME OF BALTIMORE COMPANY

	1926	1927	Per Cent Decrease
January	$70,135	$72,128	*2.84
February	27,606	27,590	0.06
March	102,917	81,500	20.80
April	81,049	61,000	24.74
May	104,860	63,529	39.42
June	73,261	41,721	43.05

* Increase.

In asking for the 10-cent rate the company also requests that it be permitted to charge a half fare of 5 cents. The regular 5-cent fare for adults was in effect until 1918 when the rate was increased to 6 cents. In the following year it was raised to 7 cents or two tokens for 13 cents. This rate continued until 1924 when the company was authorized to increase it to two tokens for 15 cents or 8 cents straight. When this action was taken extensions were made in a number of the base-fare zones.

Mr. Emmons said:

Our difficulties grow out of the changing trends in city transportation and traffic. When the long-awaited "saturation point" in the use of automobiles is reached, then the electric railways will find their new service levels. This "saturation point" may not come in Baltimore until so many private automobiles have been poured into the downtown traffic streams that the movement of traffic is slowed down almost to a standstill and the man who has abandoned his street car for a private automobile finds that his automobile is of no use to him any more.

Or it may be dependent upon the automobilist's discovery that he is losing money by giving up the use of street cars. Everyone knows how expensive automobiles are to own and operate, but the fear of expense has not yet redounded to the benefit of general transportation systems. The fact is, of course, a person may take several street car rides for the money he spends to keep an automobile that will be available for a single mile. That fact so far has not sunk home, or it is given little thought.

It may be said that railway service is too slow and uncertain. That unfortunately is a fact today, but it is merely a link in a chain of circumstances.

Back of it are traffic congestion causing untold delays, automobile parking and the decrease in riding, which, as would be the case in any other business, makes necessary a decrease in the output of the railway's product, which is car miles.

The petition filed by the company states that a recent study shows that during the period from 1915 to 1926 the number of passengers carried over long city lines has increased 50 per cent and the total carried over short city lines has decreased slightly. In the same period car miles over the long lines increased 50 per cent and car miles over short city lines have decreased about 9 per cent. The steady drift of the population, it is cited, has been farther and farther away from the center of the city, which, together with zone extensions ordered from time to time by the commission, has made a marked increase in the length of the average ride. The application says:

The cost to your petitioner in the increased length of ride required to be given because of the 1924 zone extensions has been checked against the loss predicted at the 1924 fare hearing, and it is clear that the zone extensions (together with school fares) required by your honorable commission in 1924, are causing a loss in gross revenues of approximately $565,000 a year.

San Antonio Company Explains Fare Situation

Makes frank statement of its reasons for rearrangement of fare on basis that includes nickel pass—Earnings and operating expenses summarized for four years

AS WAS told in ELECTRIC RAILWAY JOURNAL, the San Antonio Public Service Company, San Antonio, Tex., put into effect on July 10 a 10-cent cash fare, three tokens for 25 cents and a nickel card good for one week to sell for 30 cents entitling the holder to ride for 5 cents on street cars or 7 cents on car lines beyond the city limits or on buses. In addition, for children between five and twelve years of age provision is made for 5-cent cash fare and six tickets for 25 cents and for school children under seventeen a 10-cent cash fare with twenty tickets in a book for 85 cents and forty tickets in a book for $1.65.

This new schedule of fare was proposed in an official communication addressed to the Mayor and City Commission on July 2 advising them of a readjustment in the car rates. In making this adjustment the company states that it is important to secure a rate that will produce the revenue necessary for the company to put its finances in condition to maintain proper service and to continue as a factor in the development of the city. In this twelve-page official document the company outlines the situation which confronts it and the reasons therefore, believing that with a thorough understanding the city will be in accord with the rate adjustment. Among the difficulties are the paving obligations, improvements on which will cost the company approximately $100,000.

In November, 1922, the company reduced its fare at the request of the City Commission from 8 cents and four tickets for 30 cents to a straight 6-cent fare. The company agreed to try this rate of fare to determine whether this would bring in a revenue which would make the operation financially satisfactory. It did not do so, and in November, 1924, the fare was raised to 10 cents for rides beyond the city limits on the just principle that those who rode the furthest should pay more. Although the amount of business has increased, the expense in handling it has also increased.

A table of earnings and operating expenses for the past four years shows an operating income of $6,533,002, operating expenses $6,689,297 and a deficit of $156,294. Another table is included showing the amount of taxes, $609,661, and paving maintenance expense, $61,534. This is introduced to show that while the company has been forced to make up a deficit of $156,293 in the last four years, the car riders have paid through this company $671,196, or more than 10 per cent of their fares, to the general public, for which as car riders they receive no direct benefit.

The company through W. B. Tuttle, president, states that with operating expenses more than double those of the pre-war level and the present rate of fare increased only 20 per cent it was economically impossible to earn a reasonable return on the investment. In addition to its present situation, the management received a request from the employees to increase the wages sufficiently to allow them to have one day of rest in seven, and for other improvements in their working conditions. The company has been unable to grant these requests as they would involve expenditure of money not being earned.

In the decree issued by the United

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States court on Nov. 26, 1919, the city of San Antonio and the Mayor and Commissioner and their sucessors in office were enjoined from enforcing an ordinance passed March 28, 1918, prohibiting the San Antonio Public Service Company from changing its rate of fare without the consent of the Mayor and city of San Antonio. This decision was sustained by the Supreme Court of the United States.

In conclusion, the message to its patrons states:

We are aware of the fact that the decision of the federal court gives us the right to make this change, but we greatly prefer to do this with your full knowledge and complete approval. The sincerity of this proposition, and the genuine necessity for an increase in our rate of fare and the fairness of the rate proposed must appeal to your sense of justice, and to the people as a whole.

Portland May Have Express Trolleys

Harry R. Miller, author of the Miller-Schorn plan for speeding up traffic, has suggested to the city of Portland, Ore., an express railway system. The suggested plan includes through street cars, making stops every half-mile or mile at regular stations; buses to handle the local traffic and subways under street intersections connecting the loading stations with the sidewalks. The new system, it is claimed, would greatly improve traffic movement and afford safety to car riders and pedestrians. The cost is placed at $40,000 a mile. It is estimated that leases from the railway for the terminals on the streets and from business houses and other interests for the use of the subways would bring in a return sufficient to pay the cost of the construction.

Withdraws Abandonment Petitions

The Benton Harbor-St. Joseph Railway & Light Company has withdrawn its petition to the Michigan Public Utilities Commission to abandon its interurban lines between Benton Harbor and Dowagiac and Benton Harbor and Watervliet in Michigan. An announcement to this effect was made by Henry W. Wallsmith, general manager. The line some time ago petitioned for the right to cease supplying service to these towns. The new action is taken to mean that railway service will be continued.

Start Made on $53,000,000 Philadelphia Terminal

Fitting ceremonies were held on July 28 to mark the beginning of construction work on the Pennsylvania Railroad's new Philadelphia passenger terminal project. Ground was broken at Cuthbert and Twentieth Streets at 11 a.m. Thus was started the excavation for the subway which is to connect the proposed underground suburban station near Fifteenth Street and the Parkway with the new main station to be erected on the west bank of the Schuylkill River. The Philadelphia passenger terminal improvements, including the additional electrification of suburban lines now under way, will represent a total expenditure of approximately $53,000,000.

More Subway Talk in Chicago

New plans presented to Chicago City Council—Eastern syndicate asks 50-year grant

NEW plans for a subway system in Chicago, much greater in scope than any scheme previously considered, were presented the week of July 20 to the City Councilmen by Alderman L. J. Grossman. Stating that he speaks for a group of Eastern financiers whose names he was unwilling to disclose, Alderman Grossman declared that by granting a 50-year franchise the city can obtain 131 miles of subways costing $467,000,000. He said that $50,000 has already been spent on preliminary plans and that work could be begun within six months after the granting of such a franchise.

The proposal as outlined by Mr. Grossman provides not only for tubes in State, Clark and Franklin Streets, in the downtown section, but for underground lines almost to the limits of the city on the north and south sides in State, Clark and Halsted Streets and Ashland, Kedzie and Western Avenues, east and west in Washington Boulevard, Roosevelt Road and 63d Street, diagonally in Archer, Grand and Milwaukee Avenues and several loops and connecting lines.

Exhaustive engineering, legal and financial data and charts were presented to the Council to show the willingness and competency of the syndicate to finance such a system.

The syndicate proposes to build the subway in three periods. The first, comprising four-track tubes in the Loop district and one two-track tube to each outlying district, would, however, be a complete transportation system in itself, the survey explains. Construction would be carried on by the "open-cut" method, thereby eliminating boring and blasting, except beneath the river. With 10-cent cash fares, or three tickets for 25 cents, the program calls for amortization of the $467,000,000 investment in 50 years and presentation of the subways to the city at the end of that period for $1.

Informed of the Easterners' proposal, acting Corporation Counsel James W. Breen and adviser to Mayor Thompson on traction matters, was skeptical. He expressed the view that it is "just another subway scheme." He declared that the only way Chicago will obtain a subway system is by special assessments and public bond issues and that proceedings of this nature are now being considered by the city administration.

An Interesting Experiment

THERE seems but one way by which the street car can hold a profitable place in modern city transportation. That is through building up the quality of service offered. Neglected, run-down equipment, worn and battered cars, listless employees and irregular service will mean public patronage at a minimum.

The policy of the Kansas City Public Service to build up a service designed to appeal to the public and to increase patronage is an interesting experiment. No doubt it will prove a wise and valuable move. The considerable improvements already made in the rebuilding of tracks and in the brushing up of cars very likely have had their influence, and when the program in this respect has been completed the beneficial results will be further evident.

The outcome of the plan to add special improvements to a group of 45 cars and to try these out on one line after another will be particularly interesting. The improvements are designed to add to the comfort, convenience and attractiveness of the cars. It is reasonable to expect that street car riders will respond to efforts of this type. If the result should not be a perceptible growth of patronage, it would at least mean increased public good will and pretty definite assurance of a stabilized position for this form of urban transportation.—*Kansas City Star.*

Status of Wage Issues in Chicago

Assurance of settlement by mediation of the wage dispute now pending between officials of the Chicago Rapid Transit Company, Chicago, Ill., and its trainmen was recently given by representatives of both parties. According to union and company leaders, the decisions of the mediation board, which is still to be chosen, will be accepted as final by both.

Progress toward settlement of the Chicago Surface Lines wage difficulty has been delayed several weeks by the failure of the two members of the Board of Arbitration to pick a third member. Circuit Judge Kickham Scanlan and E. J. McIlraith, Chicago Surface Lines staff engineer, were chosen July 19 by the wage conference to represent the union and the companies, respectively, on the mediation body.

Further complication of the surface lines wage situation appeared on July 21 when leaders of the local metal trades council met to formulate wage demands for the 4,000 mechanics employed by the system. An average increase of 12½ cents an hour will probably be asked.

AWARDS FRANCHISE. — Citizens of Perry by a vote granted the Iowa Railway & Light Company a new franchise to extend over a period of 25 years.

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Higher Fare Schedule Filed in Holyoke

A revised rate schedule for the Holyoke Street Railway, Holyoke, Mass., filed with the Massachusetts Department of Public Utilities on Aug. 1 by L. D. Pellissier, president, proposes an increase of fares from 6 to 10 cents, with ticket concessions and zone changes. Ten-cent cash fares with transfer privilege tickets at four for 30 cents and in some instances tickets at 10 cents, the latter to take the place of two 6-cent fares in certain cases under the present system, constitute the main features of the proposed readjustment submitted by the company as a means of deriving additional revenue. Without this subsidy, it is stated, the company cannot continue to give service except at a loss.

Regulations governing zone A, in which City Hall is now a universal fare limit, are modified. By the new schedule a 10-cent cash fare will be required to ride across the zone, but a 7½-cent ticket will entitle the holder to ride through the zone as far as Race and Dwight Streets in one direction and as far as High and Appleton Streets in the other. This is in pursuance of the company's desire to maintain the lowest practicable rate on short-haul business. Overlaps will be allowed on certain lines to carry passengers beyond points that now call for the payment of a second fare.

On the Amherst division fare limits have been changed and on the Westfield line tickets will be sold four for 75 cents, each ticket good for one ride in through cars between the end of the Westfield-Holyoke line and Dwight and Race Streets, Holyoke.

The company's report to the Department of Public Utilities for six months ended June 30, 1927, shows operating revenue of $438,012, compared with $463,487 for a similar period of 1926, and a net loss after all charges of $3,905, against a net profit of $8,613 for the first six months of 1926.

Settlement in Rainier Valley Expected

If the Seattle & Rainier Valley Railway accepts a proposition which has been formally adopted by the Seattle City Council, fares on the private line, including right of transfer to the city lines, will be reduced from 10 cents cash to an 8⅓ cent token. M. C. Sampsell, president of the company, is said to have agreed to the arrangement, designed to enable the Rainier Valley line to pay the city $77,135 which is owed in gross earnings franchise tax. For each transfer accepted from the Rainier Valley Railway by the Seattle Municipal Railway, the private company will be allowed 1⅔ cents to apply on its delinquent franchise tax.

The Seattle Municipal Railway will continue to operate buses along Empire Way, the City Council has decided, following a public hearing. Residents of Rainier Valley protested the award of the bus franchise to the Seattle & Rainier Valley Railway. A monopoly of transportation in the valley was asked by the company several months ago, when the Council made demands that it fulfill its franchise obligations by paving between the tracks of Rainier Avenue. Two concessions, however, have been granted the company when the Council agreed to relieve it of paying a gross earnings tax of 2 per cent after Jan. 1, 1928, and of carrying city firemen and policemen free.

Marking Time in Batavia

Batavia, N. Y., without transportation facilities since the Batavia Traction Company abandoned its line a month ago, is awaiting definite action on a bus system to fill the gap. While the City Council has granted the company permission to operate a bus line, Stephen W. Brown, president of the company, reported to the Council that the line has not the necessary means to finance the bus project. He explained that persons who had been expected to back the project had withdrawn their support. L. H. Shultz, president of the Western New York Motor Lines, Inc., operating routes from Buffalo to Rochester and Le Roy, has suggested a citizens' stock company, to operate the bus system.

Scranton Company Wins Modification Order

The Scranton Railway, Scranton, Pa., has succeeded in its effect to have the Pennsylvania Public Service Commission modify its order regulating the travel of one-man cars over crossings in this city. The modification order by the commission agrees to the railway's proposition to have the watchmen maintained by the railroad at the Lackawanna Avenue and the Elm Street crossings signal one-man cars and operate the electric railway de-rail near the crossings. A co-operative arrangement for the payment of the watchmen's salaries had been agreed upon by officials of the Scranton Railway, the D., L. & W. Railroad and the Central Railroad of New Jersey. This co-operative arrangement has been approved by the commission. The electric railway maintained that one man was sufficient to regulate each crossing and that the cost of this man's service should be shared jointly.

The company, in filing its application for a modification, claimed that it was costing more than $15,000 a year to maintain watchmen at these crossings.

The commission's permit is a revision of a former order dated May 25, 1926, in which the company was authorized to operate the one-man cars. The original order directed the railway to maintain watchmen at the three crossings, and ordered operators of the one-man vehicles to come to a positive stop within 15 ft., of each crossing in order that the motorman-conductor by due diligence might satisfy himself as to the safety of proceeding.

Seven-Cent Fare in Fresno

The Fresno Traction Company, Fresno, Cal., has been authorized by the Railroad Commission to place in effect a fare of 7 cents to apply to all lines now operated either entirely in the city of Fresno or partly in the city of Fresno and partly in the unincorporated portion of the county of Fresno and within the present 6-cent fare zone, and that tickets or tokens, unlimited as to time for use, and each entitling bearer to one ride within the limits of said zone, be offered for sale on the cars of the company at the rate of three tickets or tokens for 20 cents.

The changes in rerouting, schedules and service proposed by the commission's engineers at the hearing appear to be satisfactory to the city of Fresno and Fresno Traction Company and the latter expressed a willingness to try the new plan.

New Fares in Westchester Effective to Sept. 1

The Public Service Commission of New York, on June 29, extended until Oct. 1, 1927, the schedule of fares authorized on Sept. 1, 1926, to be effective until July 1, 1927, on the lines of the New York & Stamford Railway in New Rochelle, Larchmont, Mamaroneck, Rye, Port Chester and other municipalities in Westchester county. The present fares were authorized after the various municipalities waived the provisions of franchises with reference to fares and they have consented to an extension until Oct. 1, 1927.

Negotiations are now pending between the County Transportation Company, Inc., and the various municipalities looking to the establishment of a system of bus transportation, but these negotiations have not been completed and extension is made to permit of a satisfactory arrangement being made. It appeared at the hearing on this petition that the operating results on the lines on the present fare basis have not been favorable but have shown a loss, and the company maintained that it could not continue operations unless the present schedule was continued during the additional time required to complete negotiations for bus service.

Drive for Organized Labor in St. Louis

The Metal Trades Council of St. Louis, Mo., informed the Central Trades and Labor Union, on July 24, that it intends to organize 100 per cent the shops of the United Railways, St. Louis. Unions that are affiliated with the Central Trades and Labor Union were asked to aid in organizing crafts that are not strictly under the jurisdiction of the Metal Trades Council.

Conductors and motormen were organized in the winter of 1917-1918 and after a brief strike won official recognition. The carmen are affiliated with the Amalgamated Association.

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Court Reluctantly Appoints Third Wage Arbitrator

Supreme Court Justice Harley N. Crosby at Buffalo, N. Y., has appointed former Judge Frederick W. Kruse of the Appellate Division as third member of the board of arbitration to settle the controversy between the Buffalo & Erie Railway, Buffalo, and its employees, members of the Amalgamated Association, over a 10 per cent cut in wages ordered May 1, 1927.

Counsel for the railway applied to the court for the appointment of the third arbitrator. H. L. Mack, former vice-president in charge of construction for the International Railway, Buffalo, chosen as a member of the board to represent the railway, was unable to agree with Harry Solomon, for Local 592 of the Amalgamated at Fredonia and Local 624 of the Union in Buffalo, upon a third member.

Attorneys representing the Amalgamated claimed the courts have no jurisdiction in labor disputes. In his decision Justice Crosby said:

I have reluctantly come to the conclusion that the court must appoint the third arbitrator. My reluctance arises from a conviction of the futility of any form of compulsion in solving labor disputes. Compulsory arbitration is a misnomer. Enter compulsion, exit arbitration. The reason that compulsory arbitration will not work is that one side is, or can be, compelled. Under our Constitution, men, either singly or in bodies, cannot be compelled to involuntary labor except as punishment for crime. That is as it should be. None nowadays believe in slavery.

However, my convictions in regard to the futility of compulsory arbitration cannot dispose of certain obvious things. These parties entered into a solemn agreement providing for a form of arbitration. This agreement was no idle ceremony.

Business Men Prefer Trolley

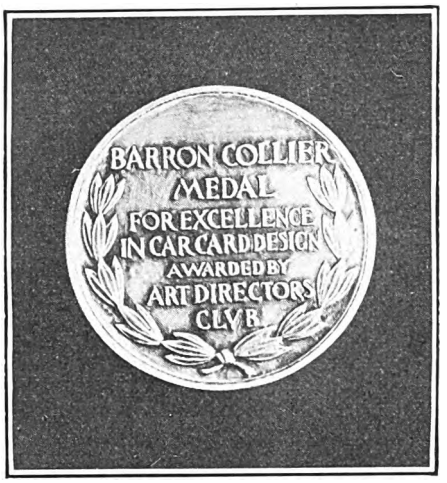
A number of Columbus, Ohio, residents, through the Business Men's Association, has presented a resolution to the City Council protesting against a proposal of the Columbus Railway, Power & Light Company to establish a bus line instead of extending the trolley line to their section of the city. The action was taken at a mass meeting of the Citizens and Business Men's Association on July 13. The association would be agreeable to a bus line if a franchise ordinance would specifically state the length of time the bus service would be maintained and the exact time of the railway extension.

Reduced Rate Tickets at Worcester

In connection with the rezoning of suburban motor coach and electric car routes, the Worcester Consolidated Street Railway has adopted a system of reduced rate tickets. The lines affected are the Worcester-Shrewsbury-Northboro and Marlboro coach route, the Worcester and Shrewsbury car route and the Worcester, West Boylston, Oakdale and Clinton coach route. The purchase of reduced rate tickets will enable passengers on these lines to save 20 to 25 per cent in fares. The fare rate for those who do not buy reduced rate tickets will be 10 cents for each zone. The rate for the reduced tickets varies and tickets must be used in specified territory.

Art Prize Goes to South Shore Line

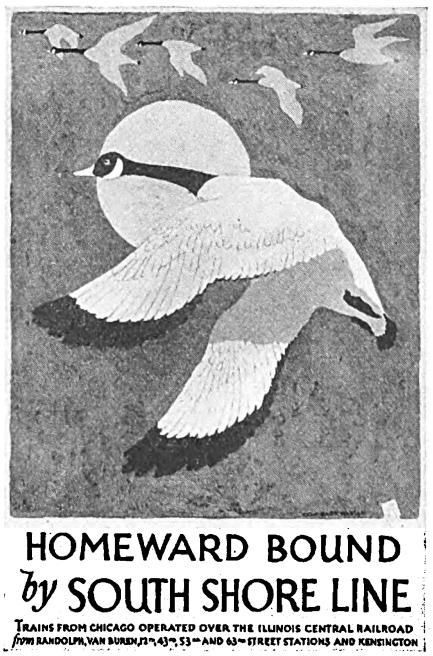
The Chicago, South Shore & South Bend Railroad, Gary, Ind., has just carried away unusual honors with one of its advertising posters at the sixth annual Exhibition of Advertising Art held at the Art Center in New York City.



Reverse of Barron Collier Medal

Three of the posters used during the last year by the South Shore Line in advertising its service were accepted for exhibition and one was awarded two medals—the Art Directors Club medal and a medal given by Barron Collier as a special prize for meritorious poster design advertising railroad service.

All three South Shore Line posters were the work of the late Oscar Rabe Hanson. The poster which won first prize was entitled "Homeward Bound" and pictured wild geese in flight silhouetted against a full moon.



South Shore Line poster which won Art Directors Club and Barron Collier Medal in sixth annual exhibition

The South Shore Line poster was entered in competition with the work of some of the leading artists and advertising agencies of the country. First honorable mention in the poster group, after the award of the two medals for the South Shore Line poster, was given to R. H. Macy & Company, the New York department store, and the New York Central Lines received second honorable mention for one of its posters.

Reproduction of the work exhibited will be published in the "Annual of Advertising Art" to be published this summer. This annual has been published for the last five years following the exhibition and has become the standard work of reference for artists, advertising men, advertisers, printers, engravers, publishers, art students and others.

The South Shore Line brings out a new poster every month. These are displayed at the elevated railroad stations of the Chicago Rapid Transit Company and at the South Shore line stations between Chicago and South Bend. This type of advertising was adopted about two years ago when Britton I. Budd became president of the railroad and has attracted much attention and favorable comment. Many of the posters featuring the Indiana Dunes have been used in the classrooms of the public schools.

No Negligence in Stopping Car on Curve

The Pennsylvania Supreme Court has upheld the right of a street railway to stop its car on a curve, when that is at a street corner, and to use standard rail. The issue arose in the case of Low vs. Harrisburg Railways, where a female passenger, alighting from a car at such a point, caught her heel in the groove of the curve rail and was thrown down and injured.

The Supreme Court found that the rail involved was of a type generally employed for curves, that its use did not indicate lack of proper care on the part of the company, that the car was accustomed to stop at about that point, and that "street railway companies do not have fixed stopping places and cannot be expected to come to a stand with exactness each time at the same point where passengers are discharged." Hence the verdict of the lower court was reversed and judgment was entered for the defendant company.

The opinion was handed down on June 25, 1927.

INTERURBANS TO ASSIST AT STATE FAIR.—Representatives of interurban lines serving Indianapolis have assured the Indiana Board of Agriculture that these companies will operate special trains to Indianapolis to accommodate attendants at the Indiana State Fair to be held the first week in September. The trains probably will be operated Wednesday or Thursday at special rates.

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Recent Bus Developments

Town Overruled by State Board

The State of Massachusetts has overruled a town which tried to prevent a line of buses from passing through. The Boston & Maine Transportation Company had obtained the necessary licenses from the several cities and towns for the operation of buses between Lowell and Worcester, except for the town of Littleton, which has declined to grant a license. The petitioner's application was filed with the Littleton Selectmen last January; but the failure of the Selectmen to grant the request after all the other intervening municipalities between Lowell and Worcester had issued permits, gave the State Department of Public Utilities jurisdiction which has been exercised in an order just issued in favor of the Boston & Maine Transportation Company. The license granted by the State Department of Public Utilities, thus overruling the town, provides that the buses shall run through the town of Littleton without stopping to take on or discharge passengers.

City of Detroit Rents Equipment

The Detroit Department of Street Railways has entered into an agreement with the Detroit Motorbus Company under which the bus company will rent the city 20 or 25 single-deck buses to be put into service on a new route from the northern section of the city to the Book-Cadillac hotel. Del A. Smith, general manager of the department, asked that his department be authorized to rent the buses for an indefinite period at 31 cents a mile. His recommendation was approved by the City Council. It is intended to paint the buses in accord with the color scheme now used on the city-owned buses.

The purchase of the garage and storage building at Schoolcraft and Newton Avenues from the Detroit Motorbus Company to store and repair D. S. R. buses now in use in the northwest section of the city has been authorized at a price of $24,000. Its utilization will enable the D. S. R. to vacate two buildings now in use at Grand River and Ward Avenues and Grand River and American Avenues being rented at $1,000 a month.

Regulatory Measure Introduced in Georgia

If a measure introduced in the Georgia Legislature is passed and signed by the Governor, all persons, firms or corporations operating a bus or buses will be compelled to register with the Secretary of State, post a bond of $5,000 against the injury of passengers and discharge all drivers arrested or convicted for driving while under the influence of intoxicating liquors.

The measure provides, among other things, that all persons, firms or corporations operating a bus line or wishing to operate a bus line in Georgia shall register with the Secretary of State, giving the names and addresses of all officers and stockholders; that before any bus can be operated, insurance in the sum of $5,000 must be provided against each person injured in an accident; that drivers arrested or convicted on charges of driving while under the influence of intoxicating liquors must be discharged upon the penalty of losing the company's charter, and that no municipality shall have the right to interfere with the operation of buses or bus lines except to enforce speed and police regulations.

Bus Service Started

The Texas Traction Company has started bus service to the River Crest section of Arlington Heights, suburb of Fort Worth. It is part of a crosstown line extending to Riverside and Oakhurst. The buses operate on a fifteen-minute schedule. The River Crest line ends at the grounds of the River Crest Country Club. Date of the starting of bus service to Diamond Hill remains indefinite, A. F. Townsend, manager of the company said. The Texas Electric Railway owns and operates the properties, formerly comprising the Texas Traction Company.

Transportation Plan at Miami Beach Changed

Adoption of a new transit plan for Miami Beach, Fla., with bus lines to all parts of the city and a 10-cent fare from any part of Miami Beach to Miami has been announced by the transportation committee of the City Council of Miami Beach and the Miami Beach Railway. The system does away with the small street cars, the jitneys and small buses, and uses only the large trunk line cars and the large buses formerly used in Miami, with seating capacity of 22. All lines will have regular schedule.

Under the franchise, voted in 1924, the Miami Beach Railway has the right to operate street cars without competition along its routes, and to change the mode of transportation by vote of the City Council.

The street cars will have a five-minute schedule both ways between Miami and South Beach and a ten-minute schedule between Miami and North Beach, at 23d Street and Park Avenue. Street car lines in Alton Road north and in Sheridan Avenue will be discontinued in favor of buses.

"Golden Arrow" Between Chicago and Detroit

A new phase of rail and motor coach co-ordination, whereby the long haul goes to the buses and the short haul to the electric railway, has been introduced by the Shore Line Motor Coach Company in collaboration with the Chicago, South Shore & South Bend Railroad. The unusual service, which is known as the "Golden Arrow," was started on July 22 between Chicago and Detroit. The journey between the two cities is completed in 8½ hours, six of which are required for the non-stop motor coach run.

Passengers using the "Golden Arrow" on the eastbound trip board the high-speed South Shore Line trains in downtown Chicago for a 2½-hour trip to South Bend, where they transfer directly into the new Shore Line motor coaches running to the heart of Detroit. Similar service is provided in the opposite direction. One trip each way is made daily, the schedule being so arranged that passengers may devote the entire morning to business in either city and still reach either Chicago or Detroit in time for dinner in the evening.

The fast train service of the South Shore Line and the non-stop run by motor coach enables the trip to be made in three hours less time than other bus services between the two cities, and nearly as fast as express trains on competing steam railroads. No stops are made for meals as the schedules are so arranged that passengers travel between Chicago and South Bend on South Bend Shore Line dining car trains.

Two new 25-passenger White motor coaches equipped with wash-room, inside baggage compartment and observation section are being operated in the "Golden Arrow" service. Although of standard 29-passenger coach dimensions, the coaches have chairs for only 25, the extra space being used for the conveniences of the patrons.

Substitution Proposed in Green Bay

The Wisconsin Public Service Corporation has asked the City Council of Green Bay, Wis., for permission to tear up the tracks on the Duck Creek line of its railway system and substitute regular bus service over this 6-mile route. The corporation has offered to maintain the present schedule, the same rate of fares and transfer privilege to the other lines of the company.

In presenting the matter to the public, C. R. Phenicie, vice-president, pointed out that his company only recently substituted bus service for electric service on all of the city lines in Manitowoc and on the interurban line between Manitowoc and Two Rivers, Wis., and that the company is now negotiating to substitute bus service on the city and interurban line in and between Marinette, Wis., and Menominee, Mich.

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Further, it was pointed out, the city of Sheboygan, Wis., has substituted bus service on all but one railway line in that city. The Wisconsin Power & Light Company has advised the state commission of its plan to substitute buses for electric interurbans connecting Oshkosh, Fond du Lac and Neenah, Wis., and had received tentative permission to experiment with a schedule of this kind on Aug. 1. The city electric lines in Oshkosh and Fond du Lac will be operated as usual.

Bus Line to Supplant Railway Line

The New York State Railways filed a petition on July 14 with the Public Service Commission for permission to discontinue operation of its railway service on North James Street in the city of Rome, and the Utica Railway Co-Ordinated Bus Lines, Inc., has applied to the commission for consent to operate a bus line, under which transportation service would be afforded the James Street territory. The city of Rome has already consented to the operation of the bus route. Public hearing will be held on the petition.

Buses Serve White Plains

Cars were not seen on Aug. 1 on Main Street of White Plains, N. Y., for the first time in twenty years, when the Third Avenue Railroad substituted buses on the line to Silver Lake Park, the sole surviving trolley line, which ran on Main Street.

It is expected that the tracks will be torn up within a month. Merchants have been petitioning for the removal of trolleys for more than five years, arguing that the narrowness of Main Street did not leave room for both the cars and automobiles which brought customers to their stores.

Co-ordination of Kansas City-Clay County Service

A co-ordination of interurban service, and equalization of fares between the electric car and the motor bus, is announced by the Kansas City, Clay County & St. Joseph Railway, which operates an electric line between Kansas City and Excelsior Springs, Mo., and between Kansas City and St. Joseph, Mo.

Robert P. Woods, vice-president and general manager, has just announced the purchase of the competitive bus line between Kansas City and Excelsior Springs. As a result of the purchase, the number of electric cars to Excelsior Springs has been reduced by half and the service supplemented by buses. Liberty, Mo., a half-way point on this line, will be the division point, and passengers will be transferred there to buses.

The bus fare will be the same as the electric car fare, an increase of 5 cents. Although there has been public protest on this increase, it is believed there will be no formal protest, as the bus makes the 30-mile trip to Excelsior Springs for 90 cents, while the electric car fare is 82 cents, plus a city fare of 8 cents.

No change is being made in the St. Joseph service.

The company now operates eighteen trains daily, both ways, between Kansas City and Liberty, nine of them going on through to Excelsior Springs. Fifteen buses are operated, both ways, over the same route.

Sixteen trains are operated each way daily between Kansas City and St. Joseph.

The equipment of the company consists of 25 electric cars and eleven buses. The system has 70 miles of main line track and has 225 employees on its payroll.

Buses Appear on Staten Island a Month Ahead of Time

Fifty-four emergency buses were in commission on Staten Island on Aug. 1 when the power operating 58 miles of municipal surface lines on the Island was cut off by the Staten Island Edison Company because of the failure of the city to pay a debt of $175,000. These vehicles, supplied by the Department of Plant and Structures of the city and by independent concerns, among them the Tompkins Bus Corporation, took care of the business of the five municipal electric railway routes and the three trackless trolley routes in the interior of the island. They carried 13,000 people apparently without confusion on a 10-cent fare. Although reports have it that many patrons were disgruntled over the increase in fare and automobile drivers over the inability to park on the upper level of the St. George terminal now occupied by the buses there was a general approval of the change. It was stated that Corporation Counsel Nicholson would be requested to wind up the affairs of the city in connection with municipal operation.

The cessation of service came as a surprise as the Staten Island Edison Company on the night previous agreed to continue to furnish power until Sept. 15 on the promise of Mayor Walker that the city would make every effort to expedite payment of its unpaid bill of $175,000. The company's bills for power, furnished for more than a year, have been held up by the Finance Department and efforts on the part of the company to bring about payment by the city have been unsuccessful. On Sept. 15 it was expected that the Tompkins Bus Corporation, which received a franchise from the Board of Estimate on July 28, would have received its certificates of convenience and necessity from the Transit Commission. It was to be ready to operate buses over the routes now covered by the surface and trackless trolley lines.

One editorial writer summarizes the situation on Staten Island by saying that buses, trackless trolleys and ordinary trolleys all had their chance under municipal operation. On a total capital investment of some $275,000 the trackless trolleys showed a deficit of more than $300,000 in four years of city operation. The passengers paid a 5-cent fare. It cost the city 12 cents to carry them. On its regular trolley system, which it leased from the receiver of a road that had previously been operated privately, the city lost about $375,000 in five years.

Buses Substituted on Stamford-Sound Beach Line

The Connecticut Company has been authorized by the Public Utilities Commission to abandon railway service between Stamford and Sound Beach. The company has long contended that the Sound Beach line was not a profitable venture. This, together with the fact that paving contracts have been awarded to the amount of $250,000, of which the railway would have to pay a part, is given as the reason for the decision to substitute bus service. The line was originally established in 1902. The commission made no decision in regard to ending the Sound Beach Avenue bus line at Laddin's Rock instead of Adam's Corner. The public wants the buses to run to Adam's Corner, while the Connecticut Company believes the route should end at Laddin's Rock to avoid a traffic hazard unusually acute at the Post Road turning.

Parley in Louisville Delayed

Mayor Joseph T. O'Neal, of Louisville, Ky., announced recently that he would not have time to discuss the proposed co-ordinated bus and electric railway franchise with Louisville Railway officials until after Sept. 1.

James P. Barnes, president of the railway, said his company was ready to discuss the franchise as soon as Mayor O'Neal's schedule permitted a conference.

Right to Continue St. Charles Line Sought

The United Railways, St. Louis, Mo., and its subsidiary, the Missouri Electric Railroad, have applied to the Missouri Public Service Commission for a certificate of convenience and necessity so that they can continue to operate a bus line along the St. Charles Rock Road between Wellston and St. Charles, Mo. The application is for authority to operate five six-wheeled vehicles, with a special service between Wellston and the West Lake Amusement Park at the junction of the St. Charles Rock Road and Natural Bridge road. The company on the St. Charles-Wellston run has a schedule of 35 minutes for the trip with a single fare of 35 cents and 60 cents for the round trip. These rates include the toll for crossing the bridge spanning the Missouri River at St. Charles.

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Financial and Corporate

St. Louis Property Sold

Reorganization committee buys in United Railways at foreclosure sale Aug. 1 for $49,601,000

THE United Railways, St. Louis, Mo., in receivership since 1919 was bid in for $49,601,000 by the St. Louis Public Service Company at a foreclosure sale on Aug. 1. The new company was formed by the reorganization committee, headed by Frank O. Watts, president of the First National Bank in St. Louis. It bid the minimum price fixed by United States Judge Faris, who has jurisdiction over the receivership.

Court Must Confirm Deal

Former Congressman William L. Igoe, the special master, who handled the sale, will report to Judge Faris on Aug. 12 to secure approval of the sale. The purchasers offered $8,301,000 for all the parcels of the railway properties and agreed to assume obligations of the old company totaling $41,300,000. The bid also included an offer of settlement of unsecured general claims against the United Railways on the basis of 33⅓ per cent if paid in cash and 66⅔ per cent if the claimants would accept preferred stock in the new company. The chief general creditor is the city of St. Louis which has a claim of $2,396,321 for back mill tax which with interest to date will total $3,500,000.

The City Counselor says the city will demand full payment of the tax. The city in common with other unsecured creditors has received the offer of one-third cash or two-thirds in preferred stock. It is almost certain that should Federal Judge Faris approve the sale and reduce the city's claim to one-third of the original claim of $2,396,321 without interest an appeal will be taken to the higher federal courts. The United States Supreme Court has already sustained the legality of the mill tax. Claims of unsecured creditors other than the city will total about $1,000,000.

The members of the reorganization committee are Frank O. Watts, J. K. Newman, A. L. Shapleigh and J. Sheppard Smith.

Commission Approval Sought

On Aug. 1 application for approval of the reorganization of the United Railways as outlined by the reorganization committee was filed with the Missouri Public Service Commission. Joint petitioners with the committee were the St. Louis Public Service Company and the City & Suburban Public Service Company.

The reorganization plan provides for the elimination of $41,296,000 of outstanding securities of the old company, including $16,383,000 in preferred stock and $24,913,000 in common stock. The securities that remain undisturbed are the $36,300,000 of general 4s and the $2,000,000 of Suburban Consolidated bonds. Bonds to be replaced by new securities include $9,790,000, St. Louis Transit Company twenty-year improvement 5s, and $4,500,000 St. Louis & Suburban general mortgage 5s.

New Capital Set-Up

The capital set-up of the new companies will include $4,500,000 sinking fund 5 per cent gold bonds of the City & Suburban Public Service Company, 53,845 shares of 7 per cent preferred stock of St. Louis Public Service Company, 345,645 shares of common stock of St. Louis Public Service Company and 19,348 shares of preferred stock of St. Louis Public Service Company with no stipulated dividend.

Duke Interests Get Charlotte Property

Transfer of the North Carolina Public Service Company, Greensboro, N. C., to the Southern Power Company was scheduled for Aug. 1, following an announcement of the sale of the local company to the Duke interests, with headquarters at Charlotte, N. C., made some time ago. Following the transfer the Charlotte concern will own the railway franchise as well as the gas and electric light rights. It is believed that the purchase of this company is one more step in the development of the Piedmont & Northern Railroad. With control of the car lines of Greensboro, High Point, Salisbury and Winston-Salem, the Southern Power Company, which owns the Piedmont & Northern, will be in a position to get into all the large cities of the Piedmont plateau without the expense of laying tracks or negotiating with other concerns for rights over their lines.

Key System Affairs Reviewed

Fewer passengers are being carried, but increased rates do not produce gross earnings to correspond with estimates

DURING the year 1926 the Key System Transit Company, Oakland, Cal., provided additional service to its patrons to the extent of 29,839 passenger-car-miles and 111,034 bus-miles, but transported 9,249,963 fewer passengers than were transported in the year 1925. The revenue passengers on the street railway division decreased 6,537,560, which is 8.46 per cent less than the previous year. The free transfer passengers on this division decreased 1,128,403, which is 5.23 per cent less than the previous year. The revenue passengers on the Key division decreased 1,584,000, or 8.89 per cent less than last year. The revenue passengers therefore decreased 8.54 per cent and the total revenue and transfer passengers 7.93 per cent compared with the previous year.

The decrease in street car passengers carried during the year was apparently due in part to a further increase in ownership and use of automobiles and in part to an increase in fares, 16.66 per cent, that took effect in January, 1926. The decrease in passengers on the Key division resulted in part from the coincident increase in one-way passengers fares and the reduction in automobile ferry rates across the bay. The reduction in auto ferry rates affected the single-trip riders but had little or no effect upon the number of commuters traveling.

The passenger revenue increased from $7,160,288 in 1925 to $7,447,397 in 1926, or $287,108; the gross operating revenue for 1926 increased over that of 1925 by $307,713. It is apparent that the increase in rates more than offset the reduction in the use of transportation, but it failed to result in the increase in revenue which was contemplated at the time of the hearing before the Railroad Commission. A very heavy increase in operating expenses occurred

INCOME ACCOUNT OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1926

Gross operating revenue		$7,597,584
Operating Expenses:		
Way and structure (maintenance)	$293,141	
Equipment (maintenance)	520,124	
Power (maintenance and operation)	713,366	
Conducting transportation	3,264,221	
Traffic expenses	9,362	
General and miscellaneous	837,416	
Transportation for investment and construction overhead (credit)	253,643	5,383,990
Net operating revenue		$2,213,594
Less taxes		474,446
Operating income		1,739,147
*Add non-operating income		$165,622
Gross profit		1,904,769
Sundry Charges:		
Depreciation	690,985	
Amortization of franchises	8,762	
Abandonment of obsolete equipment	9,251	708,999
Balance—Current operations		$1,195,769
Deductions:		
Bond interest	$915,615	
Other interest	43,567	
Miscellaneous	18,193	977,376
Surplus—Current operations		$218,393
Profit and loss adjustments (credit)		188,139
Surplus		$406,533
Surplus from prior year		284,194
Total surplus		$690,727
Less four quarterly prior preferred dividends paid		413,644
Balance to surplus account		$277,083

* Includes $105,323.41 net revenue, Key System Service Company.

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VALUATION FIGURES OF KEY SYSTEM TRANSIT

As of Dec. 31, 1926:	Reproduction Cost New	Reproduction Cost New Less Depreciation	Historical Reproduction Cost
1 Total operative property, system (not including materials and supplies)	$37,784,297	$26,189,140	$27,058,065
1-A Work in progress (operative property) approximate $2,000,000	2,000,000	2,000,000	2,000,000
2 Materials and supplies on hand Dec. 31, 1926	784,985	784,985	784,985
3 Total operative property, system	40,569,282	28,974,125	29,843,050
4 Total non-operative property, system	1,501,540	1,431,489	1,440,391
5 Total operative and non-operative property, system (including materials and supplies on hand Dec. 31, 1926)	42,070,822	30,405,614	31,283,441

during the year, mainly on account of the labor award, made effective the first of 1926, granting an eight-hour day with increased pay to the platform men. This increase in operating expenses alone was $400,000.

The company had thirteen bus lines operating at the end of 1926 and installed an additional line on Telegraph Avenue in the early part of 1927. None of the bus lines has been self-supporting and in a number of cases where they serve isolated or partially developed territories the losses have been severe. It had not been contemplated when these lines were installed that these buses would pay for their cost of operation, but the results have been so disappointing that it has been found necessary to take steps to reduce the amount of bus service rendered.

It was estimated at the time the rate decision of the commission was issued that the temporary rates would produce an additional revenue of $846,000 a year, divided as follows:

Temporary rate	Net Amount of Increased Revenue on Annual Basis
7-cent street car fare	$526,000.00
21-cent single trip transbay fare	256,000.00
$5.20 monthly commutation transbay fare	64,000.00
Total estimated additional revenue	$846,000.00

The actual experience for the year 1926 under the emergency rates showed increased passenger receipts of only $277,870, divided as follows:

	Increased Revenue Over 1925
Street car division under the basic 7-cent fare	$259,086
Key division under the basic 21-cent transbay fare (decrease)	17,147
Key division transbay commutes	35,931
Total net increase in passenger receipts	$277,870

As pointed out in the interlocutory decree of the Railroad Commission in which temporary rates were established, it was required that "the company should make a detailed inventory and appraisal of its physical property in such a manner as to enable it to set up a full and complete property ledger."

The valuation work has been carried on under the supervision of Richard Sachse, the company's consulting engineer, in conjunction with the Railroad Commission engineers. The valuation report by Mr. Sachse has been completed and presented in evidence before the commission.

Net additions to the property completed and put into operation during the year 1924 involved an expenditure of $855,714, for the year 1925 $355,243 and for the year 1926 $1,355,794, making a total of new work completed for the three years $2,566,752. In addition to this amount there was in progress $4,335,870 of work not completed at the end of the year 1926, of which the estimated amount to additions is $3,813,524, making the total net additions for the three years $6,380,276.

MISCELLANEOUS STATISTICS OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1926

Passengers Carried:		
Traction Division:		
Cash and ticket fares—7 cents		67,030,518
School tickets—3½ cents		2,168,191
Commutes (East Bay cities)		721,327
Miscellaneous—14 cents, 21 cents, etc.		828,637
Total revenue passengers		70,748,673
Free transfer passengers		20,439,835
Total revenue and transfer passengers		91,188,508
Key Division:		
21-cent transbay fares	7,373,109	
Commutes—transbay	7,885,482	
10-cent children's fares	164,930	
San Francisco-Sacramento railroad tickets	228,670	
Miscellaneous transbay tickets	68,646	
Total transbay passengers		15,720,837
7-cent fares (East Bay cities)	472,206	
3½-cent school tickets	43,068	
Total passengers (East Bay cities)		515,274
Total revenue passengers—Key division		16,236,111
Entire System:		
Revenue passengers		86,984,784
Revenue and free transfer passengers		107,424,619
Average fare, revenue and transfer passengers—traction division, cents		5.43
Average fare, revenue passengers—transbay, cents		15.67
Average number of passengers per day—traction division		249,832
Average number of passengers per day—transbay		43,071
Street car fares increased from 6 cents to 7 cents and transbay fares from 18 cents to 21 cents on Jan. 15, 1926. Monthly commutation rates increased from $4.80 to $5.20 on Feb. 1, 1926.		
Car Mileage:		
Passenger car mileage	18,064,234	
Freight car mileage	32,538	18,096,772
Car Hours:		
Passenger car-hours	1,751,087	
Freight car-hours	6,364	1,757,451
Ferryboat mileage		112,780
Motor coach mileage		960,835
Rolling and Floating Equipment Owned:		
Passenger cars		540
Motor coaches		41
Work cars		103
Tool cars and wreckers		4
Electric locomotives		3
Ferryboats		5
Miles of track owned		266.87
Miles of track operated under lease, etc.		2.27
Total miles of track operated		269.14
Miles of bus lines operated (round trip distance)		64.78

COMPARATIVE STATISTICS OF KEY SYSTEM TRANSIT

Comparison between car-mile ratios of traction division of Key System Transit Company and the averages of 93 city railways—data from A.E.R.A., May, 1925, pages 1622-23.

	Key System Transit Company, Traction Division, Cents per Car-Mile 1926	98 City Companies Cents per Car-Mile 1926
Railway operating revenue	35.33	45.65
Railway operating expense	28.93	33.63
Net operating revenue	6.40	12.02
Net revenue—auxiliary operations	.....	0.11
Taxes	2.11	2.84
Operating income	4.29	9.29
Non-operating income	0.28	0.68
Gross income	4.57	9.97
Deductions from gross income	3.75	7.10
Net income	0.82	2.87
Way and structures	2.88	4.49
Equipment	3.95	4.41
Power	4.11	4.37
Conducting transportation	16.02	15.59
Traffic	0.05	0.12
General and miscellaneous	3.49	4.46
Transportation for investment—credit and construction overhead	1.58	0.01
Total operating expenses	28.92	33.63
Railway operating revenue per mile of single track	24,415.00	35,557.00
Revenue Passengers:		
Per mile of single track	342,941.00	529,448.00
Per passenger-car-mile	5.0	6.5
Total Passengers:		
Per mile of single track	442,019.00	682,888.00
Per passenger-car-mile	6.4	8.4
Ratio:		
Transfer passengers to revenue passengers (per cent)	28.9	28.4
Revenue car-miles:		
Per mile of single track	69,126.00	77,887.00
Per car-hour	10.1	9.0

Forty one-man, two-man traction cars of the company's standard 900 type were purchased and put into service during the year. Two traction division passenger cars were constructed at the railway's own shops and put in service. Work car equipment consisting of four differential chute motor cars and six Differential chute trailers were also purchased and put in service. These are said to have saved the company a great deal of money in connection with the large amount of track reconstruction work undertaken during the year. One hundred and eighteen Key division cars are being equipped with Tomlinson automatic couplers as rapidly as they can be relieved from regular service and it is contemplated that this work will be completed about the middle of 1927. Six Yellow buses and fourteen Fageol buses were purchased and put into service during 1926 and the early part of 1927 as part of the company's automotive fleet.

Lester S. Ready, president, by whom the report was submitted, said in concluding his summary of the affairs of the company for the year:

The communities served by this company are still enjoying very rapid growth, and as stated in the previous annual report "the greatest aid toward their continued successful development is transportation." This company is providing such transportation, but it has not yet been able to collect sufficient revenue to justify the service furnished. The company confidently expects the co-operation of its patrons as well as the communities in which it operates in order to furnish the service that is required for a rapidly growing district.

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Rockford-Freeport Line Bought by Ellis Interests

Milton Ellis, Rockford, Ill., recently acquired the Rockford-Freeport Railway, upon his bid of $46,800 at receivership sale conducted by the master in chancery. The interurban owns 26 miles of track. It appears that ownership of the $490,000 of bonds of the interurban passed to the Rockford Public Service Company some time ago, so that ownership of the interurban reposes with that company. The sale of the Rockford-Freeport line disposes of all but one of the interurban and local city railway bankruptcies, leaving only the Belvidere, Lake Delavan & Janesville lines to be disposed of later.

In connection with the realignment of the properties of Rockford, it is significant that the Illinois Commerce Commission has approved the sale of the Elgin & Belvidere Electric Company and the Rockford & Belvidere Electric Company to the Elgin, Belvidere & Rockford Railway, authorized to operate as a carrier between Rockford and Elgin. In addition to authorizing the purchase of the two companies on May 1, by C. N. Ellis, Jr., from Bion J. Arnold, the commission authorized the issuance and sale of $1,300,000 of securities to finance the transaction. Mr. Arnold, the former owner, becomes president of the new company and Mr. Ellis, vice-president and general manager.

Wants City to Take Over Tramway

The Colorado Springs & Interurban Railway system wants the city of Colorado Springs, Colo., to purchase its railway system and offers it for $500,000, 50 per cent of it to be paid the company in city bonds if the city likes the idea. The company states that it cannot put any more revenue into it; that regardless of the fact that it has been given an increase in fare and has substituted buses in some sections, it is not paying what it should, and in the event that the revenue falls lower the system must be junked. City officials acknowledge the offer and say that they are considering the matter. The company is owned by the Myron Stratton estate. William Lloyd, president of the board of trustees, presented the offer to the city.

Sale of Central California to Southern Pacific Urged

Oral argument has been heard by the Interstate Commerce Commission on the application of the Southern Pacific Company for authority to acquire control of the Central California Traction Company through the purchase of its capital stock. The electric railway extended from Stockton to Sacramento, Cal., a distance of 55 miles, and its acquisition by the Southern Pacific is opposed by the Atchison, Topeka & Santa Fé. The Southern Pacific proposed to pay $2,900,000 for the stock of the electric railway, most of which is owned by Herbert Fleishhacker, its president. Of this sum $2,200,000 will be paid in bonds of the Pacific Electric Railway.

Counsel for the electric railway has pointed out that the California Railroad Commission has recommended approval of the Southern Pacific's application on the ground the financial condition of the electric railway requires its immediate sale and because it would be an economic waste for the Southern Pacific to build a line between Stockton and Sacramento while the electric railway is available. It was also figured the road has been a losing proposition since its organization, it having been kept going only through lines made by its president and is now being operated at a loss of about $10,000 a month for nine months of the year.

President Fleischhacker urged the commission to approve the application.

Control of Oklahoma Railway Passes to Kansas City Interests

Through the purchase of the control in the Southwest Securities Company, a new group of owners has come into control of the Oklahoma Railway, operating in Oklahoma City and running three interurban lines that serves a dozen central Oklahoma towns.

Reports of the closing of the deal in financial circles are confirmed by H. P. Wright, Kansas City investment banker, who represents the buying group. Terms have been reached by the directors, and, at a meeting of the stockholders in St. Louis on July 27, the sale was confirmed. Mr. Wright refuses to reveal at this time the identity of his associates, or the amount of money involved in the purchase.

An engineering firm, it is learned, has just completed a survey of the railway properties in Tulsa for prospective buyers. Engineers, however, advised against the purchase until the present jitney competition has been removed.

In addition to the properties in Oklahoma City (65 miles of track) the company operates six bus lines as supplementary service. The property also includes three electric lines out of the Oklahoma capital city to El Reno, Guthrie and Norman, with a total trackage of more than 75 miles. The system was built at a cost of $7,500,000, according to G. T. Lackey, president.

Mr. Wright is chairman of the board of the banking firm of Prescott, Wright, Snyder & Company, is a director of the Frisco Railroad, president of the Kansas Gas Company, and is represented on the board of more than a score of large Southwestern companies.

Steam Depreciation Hearing on Nov. 9

The Interstate Commerce Commission has set the date for a rehearing of the case in Docket No. 15,100, Depreciation Charges of Steam Railroad Companies, for Nov. 9, 1927. The steam roads have been asked to file with the commission on or before Sept. 1 a statement setting forth specifically and in detail the matters in regard to which they desire to introduce evidence at the further hearing. In postponing the similar proceeding with respect to the electric railways the commission indicated that that hearing would not be held until after the conclusion of the case of the steam carriers. It is planned to hold another meeting of the American Electric Railway Association's committee on depreciation before the hearing on Nov. 9.

Hocker Line Sale on August 26

The Hocker interurban line, officially known as the Kansas City, Lawrence & Topeka Electric Railway, will be sold at public auction on Aug. 26 from the steps of the Johnson County courthouse at Olathe, Kan., Peter W. Goebel, special master appointed by the federal court announced recently. Discontinuance of the line was ordered July 6 by Judge John C. Pollock at the request of Mr. Goebel, the receiver.

Separate Unit Organized in Bristol

The Bristol Traction Company, Bristol, Conn., has been organized to take over the railway which has been operated as a part of the Bristol & Plainville Electric Company. The last session of the Connecticut General Assembly authorized the change, believing that better results can be secured by operating the railway as a separate unit. J. Henry Roraback has been elected president of the railway and Charles L. Campbell secretary and treasurer.

New Haven Assumes Springfield Obligations

The Massachusetts Department of Public Utilities has approved the purchase by the New York, New Haven & Hartford Railroad of the twenty-year first mortgage bonds originally issued by the Worcester & Southbridge Street Railway, now a part of the Worcester Consolidated Street Railway, dated Sept. 1, 1902, and to be extended to Aug. 1, 1930. The price to be paid is not to exceed the face value and accrued interest, totaling $398,000.

Further, the Department of Public Utilities has approved the purchase at an aggregate price not exceeding $198,337, by the New York, New Haven & Hartford Railroad, of notes or lease warrants of a face value of $239,033 of the Springfield Street Railway in accordance with a conditional sales agreement covering 50 cars purchased recently.

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Legal Notes

CALIFORNIA—*Overturning of Vehicle Raises Point of Negligence.*

The overturning of a vehicle operated by a common carrier raises an inference of negligence under the doctrine of *res ipsa loquitur.* [Seney vs. Pickwick Stages, Northern Division, Inc., 255 Pac., 279.]

FEDERAL SUPREME COURT.—*Statute Requiring Paving Upheld.*

The electric railway in Ft. Smith, Ark., operated originally under a franchise requiring it to pave a part of the streets. In 1921 the company surrendered this franchise to the State for an indeterminate permit which did not require it to do any paving. In 1923 the Legislature passed a statute of nominally general nature, though because of its terms it applied only to the Fort Smith property, requiring it to pave a portion of the streets. As it did not do so, the city constructed the paving and brought suit against the company for its cost. The railway company claimed that the absence of reference to paving in the permit meant exemption, but the Supreme Court said "No such exemption appears in the permit. Provisions of this character are not lightly to be read into a contract between a state and a public utility." The court also found that the constitution of Arkansas reserves the right to the Legislature to alter any corporate charter and said: "The imposition of burdens, otherwise legitimate, upon a public service company cannot be held invalid as confiscatory because the permitted rate does not allow an adequate return." [Fort Smith L. & T. Co. vs. Board of Improvement, 47 Supreme Court, 595.]

FEDERAL SUPREME COURT—*Certificates, Taxes and Insurance May Be Required of Interstate Bus Carrier.*

An Ohio law requires all motor transportation companies to obtain a certificate from the Public Utilities Commission and that this law shall apply to interestate commerce only in so far as such regulation is permitted under the Federal Constitution. An interstate bus carrier was required to pay the annual license fee required of all automobile users and an additional tax for the maintenance and repair of the highways and for the administration and enforcement of the laws governing the use of same, and also to take out liability insurance. All of these provisions were upheld by the Federal Supreme Court. [Clark et al. vs. Poor et al., Public Utilities Commission, 47 Supreme Court Rec., 702.]

ILLINOIS.—*Authority of Commission Over Highway Crossings Upheld.*

In 1905 an electric railway built tracks on an unimproved public dirt road, which, at one point, passes under a steam railroad track in a very narrow arch, and agreed with the township to stop all its electric cars and flag them through this arch as there is not room for a vehicle to pass through it when an electric car is also passing. Later another highway was opened, which greatly reduced the vehicular travel on the dirt road, to an average of about six vehicles per day, and the Illinois State Commission authorized the electric railway to install a signal system at that point and thereafter not stop its cars before entering the arch. The township brought suit but the action of the commission was upheld. [Illinois Commerce Commission vs. Omphghent Township, 156 N. E., 766.]

KANSAS.—*A Switch Is Not a Nuisance.*

A railway company undertook to install a "Y" switch at a certain corner in a residential district. An abutting property owner attempted to enjoin the company on the ground that the switch was noisy, but the court held that such noise "was simply one of the inconveniences which inevitably attend the establishment of a residence in a city where street railways are lawfully permitted to construct and operate transportation facilities." [Nuttle vs. Wichita R. & L. Co., 256 Pacific, 128.]

MASSACHUSETTS—*Injuries Not Due to Negligence.*

Evidence showing that plaintiff slipped and fell on banana peel on stairway owned by defendant, and open to public, held insufficient to support recovery in the absence of any showing of defendant's negligence. [Mascary vs. Boston Elevated Ry. Co., 155 N. E., 637.]

MISSOURI—*Rules on Injuries to Pedestrian at Crossings.*

Evidence that a street car approaching a crosswalk and a pedestrian crossing a street were moving at a speed of about two or three miles per hour, and that the car could have been stopped within 3 ft., held to warrant submission to jury on theory of street railway's liability for injuries to pedestrian because of its traffic supervisor's failure to signal motorman, whose view was obstructed by cars on parallel track. [Bocklitz vs. Wells, 293 S. W., 71.]

NEW YORK—*Decides When Franchise Can Be Revoked.*

A street railway franchise, granted by the state on consent of the city, can be revoked by the state alone, and by it only through judicial proceedings and judgment. [International Ry., vs. Schwab. Mayor, 221 N. Y. Supp., 384.]

OHIO—*State Courts Will Not Interfere with Federal Receiver in Franchise Matters.*

Proceedings were brought to declare a franchise void because an interurban railway declined to pay part of paving charges, as required in its franchise, but it developed that all such charges had been paid up to the time that a federal receiver for the railway had been appointed. The State Supreme Court held that the Federal Court having obtained prior jurisdiction and custody of the property, the method of its operation was withdrawn from the jurisdiction of the state courts. [State ex rel Crabbe vs. Indiana C. & E. Traction Co., 157 N.E., 15.]

OHIO—*Passengers Frightened by Headlight on Locomotive.*

Plaintiff was a passenger on a street car at about 6 p.m. It was very dark and a railroad locomotive was about to cross on its tracks at an intersection where the tracks of the railway cross its tracks. Because of the darkness the engineer had turned on the headlight of the locomotive. The street car and locomotive reached the intersection at about the same time, but there was no collision. As the street car was crossing the railroad tracks some of the passengers became frightened by the headlight of the locomotive. Plaintiff was not amongst them as she was somewhat drowsy. The other passengers, in their fright, trampled on her resulting in physical injuries. A verdict was directed in favor of the defendant at the end of plaintiff's case and was affirmed on appeal, on the ground that the injury to the plaintiff, following the fright produced on the passengers by the headlight of the locomotive, was solely caused by the passengers and the defendants were not parties to this act of the passengers produced by fright arising from mistakenly anticipating the danger of a collision which did not occur. [Mancuso vs. Cleveland Ry., et al., 155 N. E., 243.]

WASHINGTON—*Company Not Responsible for a Passenger Alighting at Unusual Place.*

A street railroad, as a matter of law, was not in duty bound to protect and warn a passenger who alighted from car at other than usual stopping place, in view of passenger's familiarity with intersection, and unimpaired opportunity to see and be fully advised of exactly where he was alighting and the approach of any auto or other vehicle. [Lindgren vs. Puget Sound Int. Ry. & Power Co., 253 Pac., 791.]

WISCONSIN—*Jurors Charged with Misconduct.*

In a case involving the question of whether the driver of an automobile made or could have made a sufficiently short turn to avoid getting on the tracks of the street railway, during the trial ten of the jurors went to the scene of the accident and made tests in turning from one street into another. The results of these tests were discussed in the jury room. Held, that this constituted grievous misconduct on the part of the jury and should result in a new trial unless it plainly and affirmatively appears that the result of such tests had no influence upon the verdict of the jury. [Temlicka vs. Mississippi Valley Public Service Company, 213 N. W., 666.]

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Personal Items

Beaver Valley Personnel Announced

Effective with the resignation of General Manager C. D. Smith, on June 30, the administration of the Beaver Valley group of companies with headquarters at New Brighton, Pa., was announced to be handled as follows:

Commercial work will be under the commercial department of the Pittsburgh Railways, with the commercial manager of the Beaver Valley companies reporting direct to the commercial manager of the Pittsburgh Railways.

Research work will be handled by the research manager of the Pittsburgh Railways.

Operations will be handled by the general manager of the Pittsburgh Railways.

The following local officers may be addressed concerning the particular phases of the work for which they are responsible, and they are authorized to approve bills, invoices, requisitions, statements and other papers requiring such attention.

J. H. Meyer, superintendent of maintenance, in charge of way and structures, overhead lines and equipment.

J. R. Marshall, superintendent of transportation, in charge of operation of cars.

H. O. Allison, commercial manager, in charge of commercial work, personnel work, claims.

A. E. Messenheimer, operating engineer, in charge of operating engineering work.

Mr. Smith is now connected with the Cleveland Railway, Cleveland, Ohio, as executive head of the new department of personnel there.

E. J. SHULER, since the latter part of 1925 metallurgist and research engineer of the New Orleans Public Service, Inc., New Orleans, La., has resigned. That company has a completely equipped laboratory, and it was in his work there that Mr. Shuler developed methods and a type electrode for manganese welding. The Bethlehem Steel Company thought so well of this work that it retained Mr. Shuler to instruct its men at its foundry and switch and frog plant at Steelton, Pa.

CARL W. STOCKS, editor of *Bus Transportation* and associate editor of the ELECTRIC RAILWAY JOURNAL, has been invited by Herbert Hoover, Secretary of Commerce, to serve on a committee of 40 students of street traffic which will draw up a model ordinance to be recommended for adoption to all American cities. Mr. Stocks also accepted membership on the papers committee of the metropolitan section of the Society of Automotive Engineers.

WILLIAM C. MCCALLUM, B.Sc., London, England, has been appointed an assistant to the chief engineer of the Yorkshire Electric Power Company. After he was graduated from the University of London he received his works training with Dick, Kerr & Company, Ltd., at Preston, and later had an extensive experience in electric traction and power application both in England and Japan. During the great war he, while a lieutenant in the Royal Engineers, was awarded the Military Cross in connection with his special services on the western front.

F. V. Skelley Made Superintendent of Equipment at Des Moines

F. V. Skelley, formerly assistant general manager of the Tri-City Railway of Illinois at Rock Island, Ill., has been appointed superintendent of equipment

F. V. Skelley

of the Des Moines City Railway and the Des Moines & Central Iowa Railway. He assumed his duties at the Fourth and Maple Streets shop on July 15. In this capacity Mr. Skelley succeeds C. R. McMahon, who has become affiliated with the Key System property at Oakland, Cal.

Mr. Skelley has had sixteen years experience in electric railway work, starting in the shop of the Tri-City Railway in 1911. He was graduated in the electrical engineering class of the Iowa State College in 1907 and then took a three-year apprentice course in the Hawthorne shop of the Western Electric Company at Chicago. Thence he went to New York as a sales engineer of the company there, where he remained till an opportunity was offered to get into the electric railway field.

W. G. GOVE, superintendent of equipment of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., planned to sail for Europe on Aug. 6 on the *Majestic*. Among other things he will study operation on the lines of the London Underground, some of the conditions on which are akin to those on Mr. Gove's own property.

J. J. Gorman Named to Detroit Street Railway Commission

Mayor John W. Smith of Detroit, Mich., has announced the appointment of John J. Gorman as a member of the Street Railway Commission to fill the vacancy caused by the dismissal by the Mayor of former Commissioner H. H. Esselstyn. For several years Mr. Gorman was the head of the John J. Gorman Company, men's furnishers, established in 1889 by his father. More recently he has been in the real estate business. The Mayor announced that he took especial pleasure in the appointment because he was thus able to introduce into public service one of Detroit's younger men "extremely well qualified and in a position to give the city not only of his abilities but of his time."

Mr. Esselstyn was deposed during the campaign against the proposed International bridge which is to be built over the Detroit River joining the cities of Detroit and Windsor, Ont. The action was taken by the Mayor because of the opinion expressed over the radio by Mr. Esselstyn in speaking in favor of the proposed bridge. Mayor Smith maintained that if a bridge were to be built, it should be under municipal control to be in keeping with the city's expressed policy in favor of municipal ownership of its utilities. At the recent referendum the people of Detroit voted to permit the private company to construct the bridge.

Mr. Esselstyn is a civil engineer. He has spent a number of years in public service. His candicacy for Mayor of Detroit has recently been announced for the coming election. In 1918 he was appointed Commissioner of Public Works by former Mayor Oscar B. Marx. He resigned this position in 1919 during the term of former Mayor James Couzens, and later built the Belle Isle Bridge. In 1921 Mr. Couzens, then Mayor, appointed him a member of the Street Railway Commission.

OBITUARY

William I. Brobeck

William I. Brobeck, widely known San Francisco attorney, and director and former counsel of the Key System Transit Company, Oakland, Cal., died from a heart attack, July 27, while aboard the steamer *Queen* on an Alaskan trip. Mr. Brobeck was author of several noted legal treatises and served as assistant to the late Franklin K. Lane when the latter was city attorney of San Francisco. Among the noted cases on which he was retained was that of the United Properties Company, in which he represented F. M. (Borax) Smith. He was an outstanding figure in the reorganization of the Key System in 1923 and was senior partner in the law firm of Brobeck, Phleger & Harrison.

Mr. Brobeck was born in Rochester, N. Y., 58 years ago.

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Manufactures *and the* Markets

$250,000 Kansas City Project Ahead

The Kansas City Public Service Company, successor to the Kansas City Railways, Kansas City, Mo., is preparing to reconstruct the Eighth Street tunnel between Washington and Bluff Streets. It is to build an entirely new steel span over Bluff Street, the Missouri Pacific and Wabash Railroads, to Ninth Street and Union Avenue. The new system will span Union Avenue and terminate at Santa Fe Street.

An incline to the surface will begin at Santa Fe Street and end at the east line of Mulberry Street. From Mulberry Street to the state line the old "L" structure is to be removed entirely and a surface line used. It will connect directly with the Central Avenue bridge over the Kaw River. One through car line to be routed back over this line will be Fairmount Park-Central Avenue. These now are two separate lines. Other lines also may use the tunnel and "L."

An ordinance granting permission to the Public Service Company to complete this work has been submitted to the Council and referred to the public improvements committee for hearing. A. E. Harvey, chief engineer of the company, said progress of the work depended upon the arrival of the steel with which to span the railroad tracks. He said:

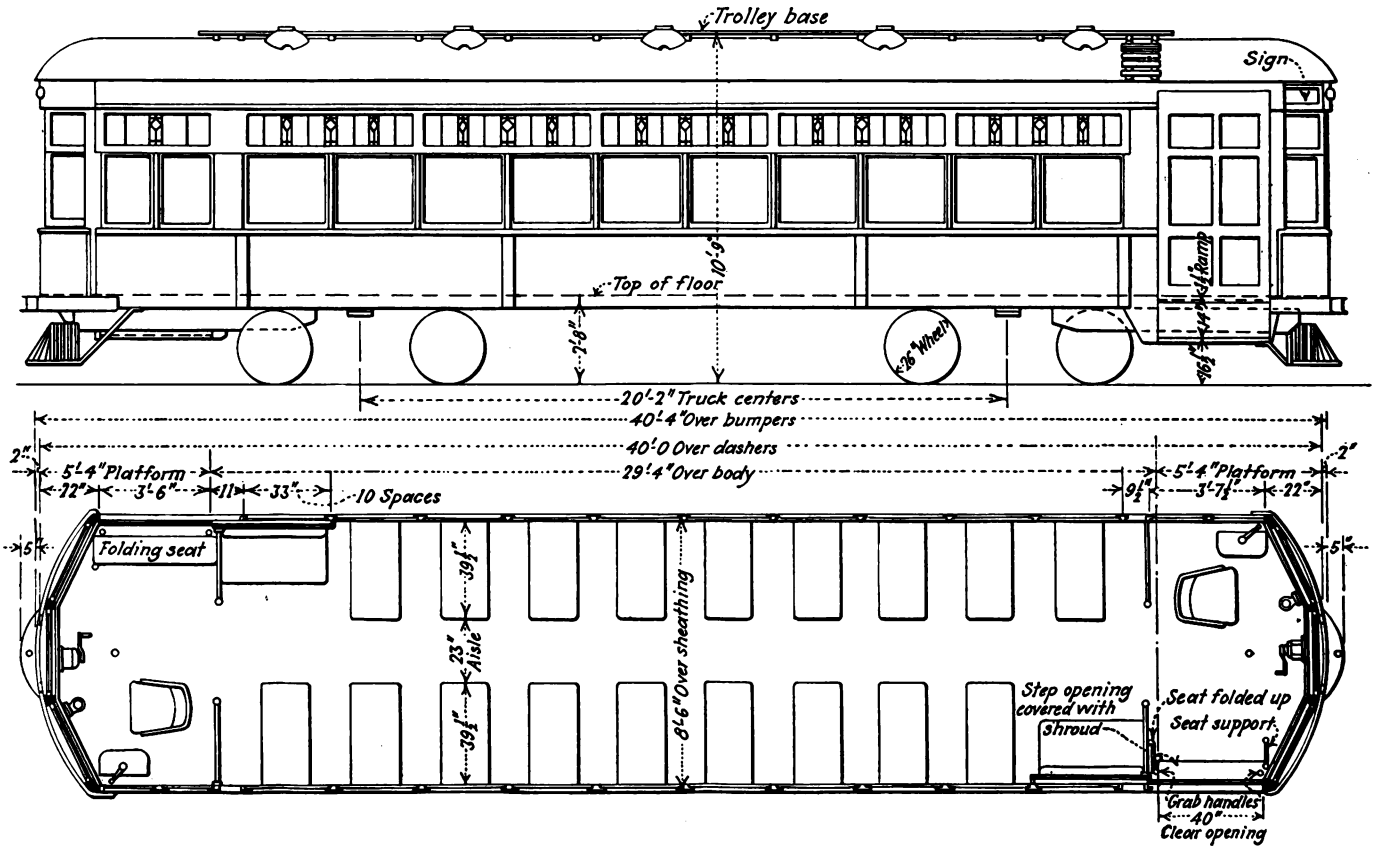
The steel will be ordered at once and it probably will take sixty days to fashion it and make delivery. The work in the tunnel really is minor, consisting mainly of cleaning, reconditioning tracks and putting in new drainage. Spanning the railroad tracks and keeping the ways open underneath for traffic will be the hardest task. Without attempting to set a definite date I should say that the new tunnel and "L" road route should be ready for use late next fall. The entire project will cost approximately $250,000, it now is estimated.

Mack Bus Deliveries Double in Second Quarter

Deliveries of Mack buses during the second quarter of 1927 more than doubled those in the first quarter, according to figures released by Roy A. Hauer, manager of the general bus department and vice-president of the Mack-International Motor Truck Corporation. Increase in deliveries for the three-month period ended July 15 over the first three months of the year was 137 per cent.

More than twice as many buses were delivered to electric railways and steam railroads throughout the second quarter than in the first, the percentage of

New Interurban Unit for Southwest Missouri Railroad



Delivery is expected in the near future of one double-end interurban unit recently ordered by the Southwest Missouri Railroad, Webb City, Mo., from the American Car Company, St. Louis, Mo. This car, the order for which was announced in the JOURNAL April 16, will be of semi-steel construction. The final specifications released by the car company follow:

Number of units	1
Type of unit	One-man, motor, passenger, interurban, double end, double truck
Number of seats	21
Builder of car body	American Car Company
City and state	St. Louis, Mo.
Date of order	April 4, 1927
Weight, total	35,000
Bolster centers	20 ft. 2 in.
Length over all	41 ft. 2 in.
Length over body posts	29 ft. 4 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	10 ft. 9 in.
Window post spacing	33 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	General Electric straight
Car signal system	Faraday
Compressors	CP 27
Control	K-75
Couplers	American Car Company
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	N. P. Co.
Doors	Sliding
Floor covering	Linoleum
Hand brakes	Brill vertical
Heaters	Consolidated Car Heating Company
Headlights	General Electric J-65
Headlining	Agasote
Interior trim	Mahogany
Motors	Four G. E. 265, inside hung
Sash fixtures	Schechter post casing
Seats	Brill No. 201-B
Seating material	Leather
Steps	Folding
Step treads	Kass safety
Trolley retrievers	Ohio Brass Company
Trucks	Brill 177-E-1
Ventilators	Brill exhaust
Wheels	Cast iron, 26 in. diameter

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increase being 165 per cent. Comparison of both quarters reveals that 60 per cent of total deliveries in the second quarter went to traction companies, as compared with 56 per cent in the first, indicating a 4 per cent increase in demand of traction companies for buses.

With the exception of two or three large individual orders for four-cylinder gas-electric drive buses and six-cylinder mechanical-drive buses, the greatest number of deliveries was made of 29-passenger, four-cylinder, mechanical drive buses of 225-in. wheelbase, indicating a continued demand for this particular model.

Versare Corporation Will Exhibit at Cleveland

One of the outstanding exhibits at the coming A.E.R.A. convention in Cleveland, Oct. 3-8, will be that of the Versare Corporation, 103 Washington Street, Albany, N. Y. It will exhibit among other things, a Versare bus, Model 6-SC-2, M-32.

In this connection, reports from exhibit headquarters are to the effect that ten companies have requested space in the truck exhibit.

Ten New Cars for Fort Worth

Ten new street cars, built at a cost of $150,000, will arrive at Fort Worth and be placed in service about Aug. 15, A. F. Townsend, manager Northern Texas Traction Company, Fort Worth, Tex., has announced. The cars are modern in every respect and were built on specifications of the utility by the St. Louis Car Company. Leather upholstering, automatic treadle rear doors, double trucks and a high-speed city service motor will be among improvements in the new cars. The size will be between that of the smaller cars in service now and the large, double-truck type.

"Demag News" Appears

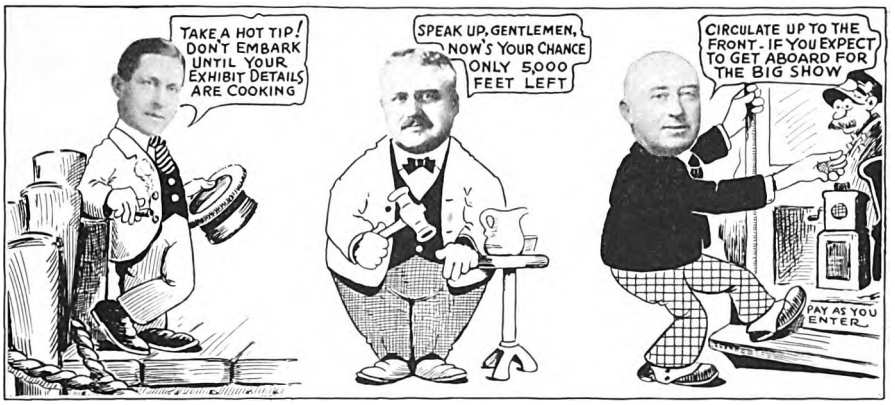
The *Demag News*, published by the Deutsche Maschinenfabrik A.G., of Duisburg, Germany, made its initial appearance as issue No. 1, July, 1927. The publication is to be a quarterly and will report on the many branches which the manufacturing program embraces.

The program includes the manufacture of every description of machine and appliance for mines, quarries, tunnel construction, power stations, railways, factories, the chemical industries, textile mills, etc., as well as complete plants for iron works, smelting works, crane and conveyor plants, etc.

A.C.F. and Not Fageol Delivered Buses to Worcester Railways

In the rolling stock items published last week the Worcester Consolidated Street Railway, Worcester, Mass., was reported as receiving five 29-passenger buses from the Fageol Bus Company of Detroit instead of the American Car & Foundry Motor Company.

EXHIBITOGRAPHS—No. 2



Oil-Electric Car Breaks Speed Record

All records for travel between Montreal and Toronto in the history of Canadian railroading were broken recently when the new type of oil-electric car, developed by the Canadian National Railways, made its inaugural trip between the two cities in the actual running time of five hours and 30 minutes. The actual trip, allowing for delays and slow orders over certain sections of the track, was made in five hours and 40 minutes, which is two hours and twenty minutes less than the International Limited, the crack Canadian National train running daily between Montreal and Chicago, covers the 334 miles between Montreal and Toronto.

New Publication on Modern Cars Issued by Westinghouse

Westinghouse Electric & Manufacturing Company has recently issued special publication 1770 on cars and car equipment. In this 32-page book is included many of the 1926 advances in the art of car design construction.

Like the former editions of this publication by the Westinghouse company, each page is devoted to a single car, including a halftone illustration, a blueprint floor plan with dimensions and complete tabulated data covering service performance, weights, electrical and mechanical equipment, dimensions, seating capacity, exit and entrance arrangement, etc.

This edition is available either from any Westinghouse district office or from the transportation section, advertising department, at East Pittsburgh. It should be requested by number and title.

Only 5,000 Sq.Ft. Left Under the Big Roof at Cleveland

Every mail cuts into your chance for an A-1 pictorial and verbal sales talk.

An exhibit at the annual powwow is worth ten at your factory.

They're All Going to the "Forest City"

McCloskey Torch-Pressed Steel Company Litigation Still Pending

Litigation referred to in the June 18 issue of ELECTRIC RAILWAY JOURNAL, page 1123, anent the McCloskey Torch Company and the Toledo Pressed Steel Company is continued in the Circuit Court of Appeals for the Sixth Circuit. While the McCloskey patent No. 1,610,301 of Dec. 14, 1926, was held invalid by the lower courts, Mr. McCloskey, trading as the McCloskey Torch Company, is continuing his fight against his former employees, the Toledo Pressed Steel Company. The case has been appealed and is still pending in the Sixth Circuit Court of Appeals, where Mr. McCloskey seeks a reversal of the lower court's decision.

Copper Jumps to 13⅜ Cents; Other Metals Climb

The non-ferrous metal markets continue to boil. Copper gained the most ground this week, with a net advance of ⅝ cent per pound in the domestic market and ½ cent in the c.i.f. price of the export association.

At the end of June considerable copper was sold at 12⅜ cents delivered. Aug. 3 a good volume of business was done at 13⅜ cents. At 12⅜ cents consumers showed little or no interest; at 13⅜, or at least at 13½ cents they bought quite freely. The former figure has not been in effect long enough to be thoroughly established. Foreign buying has been good all week, at steadily advancing prices. The export association advanced its price to 13⅜ cents July 30, to 13.50 cents on Aug. 2, and Aug. 3 the price was 13.65 cents. The domestic sales for the month of July involved a total tonnage fully three times greater than that of June, with buyers including wire-drawers and electric manufacturing companies as well as brass makers. The bulk of the business has been for

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METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Aug. 2, 1927
Copper, electrolytic, cents per lb.	13.08
Copper wire, cents per lb.	14.75
Lead, cents per lb.	6.70
Zinc, cents per lb.	6.77
Tin, Straits, cents per lb.	65.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.35
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.025
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings. Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.90
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.62

†Quotations withdrawn on account of strike.

August shipment, with some for September and only the exceptional lot for October.

As to lead, the American Smelting & Refining Co. advanced its official contract price for New York lead from 6.50 cents to 6.60 cents on July 29, and Aug. 3 a further advance to 6.75 cents was made. Sellers in the outside market have been obtaining premiums over the smelting company's price all week on good-sized tonnages, and the advance of Aug. 3 seems warranted by the brisk demand.

On an active week's business, with both consumers and dealers participating in the buying, zinc prices advanced moderately. High-grade continues to be quoted at 8 cents, New York, for spot carload lots, with the market dull.

Statistics issued by the American Zinc Institute on July 27 show 77,227 retorts in operation as of July 15, against an average of 80,373 during June. Stocks were also lower at mid-July than at the end of June, the figures being 41,083, compared with 43,858.

The advance in tin during the week is ascribed to speculative and dealer buying rather than to purchases by consumers. However, the market is firm. Little change is anticipated in the statistical position and no definite tendency up or down can be forecast.

ROLLING STOCK

Boston Elevated Railway, Boston, Mass., is reported to have asked for bids on ten convertible cars.

Pittsburgh Railways, Pittsburgh, Pa., is preparing specifications for the purchase of fifteen new light-weight interurban cars.

Virginia Electric & Power Company, Richmond, Va., has added five more White buses, Model 53 with 21-passenger capacity. These buses, which are in use in Norfolk, Va., bring this railway's total fleet in Virginia cities to 93.

Holyoke Street Railway, Holyoke, Mass., has put a new 25-passenger gas-electric Mack bus into service on its West Dwight Street line.

TRACK AND LINE

Columbus Railway, Power & Light Company, Columbus, Ohio, will lay 1 mile of new track on North High Street as part of its program to give the city additional service. Track also will be laid from Parkwood Avenue to Nelson Road, a distance of ½ mile, when crossing of the Norfolk & Western are eliminated.

Portland Electric Power Company, Portland, Ore., has let the contract for laying new rails and concrete base along several lines in Oregon City, Ore. The work on Water Street has been completed and the crew has started on the work on Main from Fifth to Twelfth.

Pacific Electric Railway, Los Angeles, is engaged in complete reconstruction of joint track on Main Street between Sixth and Ninth Streets. The 127-lb. girder rail will replace the old 87-lb. rail and an asphalt-concrete base with asphalt wearing surface will be used. Renewal of tracks and ties at curves on Marmion Way is under way.

Minneapolis Street Railway, Minneapolis, Minn., is finishing its new trackwork for 1927, the construction of eighteen blocks of new double-track line and the doubling of eight blocks of old single-track line. Hollowspun trolley poles are being utilized for the first time. With the opening of the double-track, eight-minute schedule is being observed on 50th Street from Penn to Xerxes Avenue instead of sixteen. The new line is from Bryant Avenue to Penn Avenue on 50th Street and on Penn Avenue from 50th to 54th Street. The new double-track work will enable extension of the Bryant Avenue car route from Bryant Avenue to Xerxes Avenue, serving a growing section with an alternative route downtown, reached now only in part by the Oak-Harriet line.

TRADE NOTES

Manganese Steel Forge Company, Philadelphia, Pa., manufacturer of Rol-Man manganese steel truck and car wearing parts, has recently opened a new office at 1335 Old Colony Building, Chicago. W. H. Potter, formerly in the main office of the company at Philadelphia, has been transferred to Chicago in charge of the new office.

Johns-Manville Corporation, New York, announces the election of Theodore F. Merseles as president. H. E. Manville, who has served as president since the death of his brother, T. F. Manville, in 1925, has been elected chairman of the board. Mr. Merseles retires from the presidency of Montgomery Ward & Company. He will continue as a director of that company and as chairman of its executive committee. While the business activities of Mr. Merseles have centered in Chicago since he headed the Montgomery Ward organization in 1921, he has retained his interests in the East, where most of his business life has been passed. After a short European pleasure trip with Mrs. Merseles, he will return to New York to assume his new duties about Aug. 15.

Pittsburgh Testing Laboratory, Pittsburgh, Pa., announces the removal of its Birmingham, Ala., laboratory to new quarters in that city, where a Riehle testing machine of 400,000 lb. capacity has been installed.

Morton Manufacturing Company, Chicago, Ill., has recently concluded arrangements for the establishment of two important foreign branches, one in connection with the Lyman Tube & Supply Company at Montreal, Que., which will cover the Dominion of Canada and the colony of Newfoundland, and the other with A. & S. Ash Brothers, a large railway equipment firm at Johannesburg, South Africa. The Morton organization is also considering arrangements for a world-wide distribution of its products.

D. B. Flower Manufacturing Company, 1217 Spring Garden Street, Philadelphia, Pa., maker of electric brush-holders, opened on July 1 its central district office in Pittsburgh at 614 Empire Building, A. B. Holcomb is manager.

ADVERTISING LITERATURE

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has issued a 64-page catalog on electric heating for railway cars. This embraces electric heaters with both open coil and enclosed types of heating elements.

Economy Electric Devices Company, Chicago, Ill., is sending out a circular on Economy meters that is a reprint of an advertisement appearing in Electric Railway Journal, issue of May 21.

New Departure Manufacturing Company, Bristol, Conn., is sending out a bulletin telling of the advantages of its ball-bearing electric motors.

General Electric Company, Schenectady, N. Y., is sending out an eight-page booklet describing gas-electric drives for buses and trucks.

Herman H. Sticht & Company, New York, N. Y., in bulletin No. 150 describe the new Ground-Ohmer, a direct-reading ground resistance meter.

Okonite-Callender Cable Company, Inc., Paterson, N. J., recently distributed a booklet on "Aerial Power Cable," describing its use.

Ransome Concrete Machinery Company, Dunellen, N. J., has published illustrated bulletin No. 105 A, on pneumatic concrete placers. The bulletin covers all phases of the subject and contains valuable data on working the apparatus.

Massillon Steel Casting Company, Massillon, Ohio, has issued a circular describing Tigerloy brake drums. It is a reprint of an advertisement appearing in *Bus Transportation*, issue of July, 1927.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, August 13, 1927 *Number 7*

Brady Award Deserves Wider Attention

EXTENSION of the time for presentation of briefs for the Anthony N. Brady Safety Award gives encouragement to electric railways to enter the contest. Prior to Aug. 1, the original date for the closing of the competition, only two companies had entered. As pointed out elsewhere in this issue by Lucius S. Storrs, managing director American Electric Railway Association, this showing by no means represents the real interest and accomplishments of the industry in this direction. There are impressive stories to tell, but the companies have been backward about presenting their cases. The time has now been extended to Sept. 1, and it is earnestly to be hoped that many additional railways will enter the contest.

When the Brady award was revived this year, after having been dormant since 1916, conditions of the contest were changed materially with the view to making the preparation of the briefs as easy as possible and encouraging a large number of entrants. Under the old conditions a complicated series of computations was necessary to determine the winner. The procedure made it difficult for the smaller companies to present their claims. At a meeting of the traffic and safety committee last January, however, the sentiment was unanimous that the award should be based simply upon "what the various companies show their accomplishments in safety to have been by answering certain general propositions and the standard accident statistical form of the A.E.R.A." To permit wide latitude in the presentations, the conditions of the contest were drawn up to resemble in a general way those of the Charles A. Coffin contest. Six factors were enumerated:

1. Good will gained as the result of safety work.
2. Original safety ideas and the adaptation of the ideas of others.
3. Improvements in service resulting from safety work.
4. Reduction in the number and seriousness of accidents.
5. Co-operation between management and employees in safety promotion.
6. Measures to promote sanitation and health.

A change was made also in the distribution of the prizes. Formerly, a gold medal was conferred upon the winning company, a silver replica upon the officer or department head who contributed most to the successful record of the company and a bronze replica to the employee whose services were most outstanding in the promotion of safety. It was felt that there were serious difficulties in the way of selecting the proper official and employee for these awards. Under the new conditions there will be three medals as before, but they will be given as first prizes to operating companies in three classes, grouped according to the number of vehicle-miles operated. This separation of the companies into three groups, depending on size, gives the smaller companies an equal chance with the larger ones, and it was hoped that many would be thereby encouraged to enter the competition.

Under these circumstances, it is somewhat surprising that only two railways have entered the contest. Many companies have put sincere effort into safety work and excellent results have been obtained. Their achievements may be well known locally, but so long as the companies hide their light under a bushel they cannot receive the wide recognition they deserve. There is yet time to correct this situation. Let every company with a commendable safety record make haste to inscribe its name on the roll of those competing for the Brady award.

Results Under Receivership in St. Louis

COMMENDABLE work by the receiver and management of the United Railways, St. Louis, is reflected in the annual report for the year ended Dec. 31, 1926. The comparative income and expense statement shows that gross operating revenue in 1926 decreased slightly from that in 1925, but that the net loss in 1926 was reduced to $43,564, compared with $206,174 for the previous year. The gross operating revenue has grown from $13,125,559 in 1917 to $18,873,430 in 1926. The number of passengers, however, has remained almost constant, being 403,300,696 in 1917 and 415,059,303 in 1926. The average fare per passenger, including transfers, in 1917 was 3.23 cents, while the average fare per revenue passenger in 1917 was 4.95 cents, compared with 6.90 cents in 1926. The number of passenger car miles has also remained practically constant.

These are some of the things which show the way the financial wind is blowing, so that the recent application of the company to the state Public Service Commission for an increase in fares was presaged on needs which the receiver is prepared to substantiate by facts from actual operation. On the management side more than 400 cars have been rebuilt and modernized and the other property has been carefully conserved. A great deal of attention was paid during the year to the more scientific making of schedules. As a result the average speed for the entire system has been increased. Operation of cars, however, is still impeded by the parking evil, but partial relief, particularly in the downtown congested district, was secured through the passage of an ordinance on Aug. 5, 1926, prohibiting parking on Grand Avenue between Laclede Avenue and Eastern Avenue. The record of the safety department shows during 1926 the smallest number of fatalities, the smallest number of collisions with persons, or animals, or wagons, the smallest number of accidents connected with shops and sheds, the smallest number of car collisions in the history of the company. For the third successive year a material reduction was made in the number of collisions with motor vehicles—the number in 1926 being approximately 2½ per cent fewer than in 1925—in spite of an increase of

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14 per cent in the number of registered automobiles in the same year. The burden of taxes and other similar charges under which the company staggered is shown by the fact that the total for taxes, street paving costs and expense on account of city sewer construction was $2,196,481, or 0.814 cents per revenue passenger.

It is the circumstances under which this record has been made that are significant. Among them, of course, is the fact of operation under the limitations of the receivership, the condition of competition that exists in the city and the uncertainties with regard to the granting of a new franchise with terms sufficiently liberal to permit the successor company to carry on adequately after the conclusion of the receivership, likely to be terminated soon, since the properties have already been sold under foreclosure. When adequate allowance is made for all the adverse factors the results secured are certainly most meritorious.

Reminders of the Old Picnic Days

RECOLLECTIONS of the early nineties are revived by the succession of news items telling about the handling of picnics en masse by buses operated by electric railways. One of the most recent of these items has to do with the transportation of 2,100 persons by bus by the Youngstown & Suburban Railway from Salem to Idora Park, a distance of 22 miles. In handling these 2,100 passengers 25 coaches were used, the start being made at 7 a.m. and the return movement from Idora Park at 6 p.m.

These are the bald facts. As stated before, it is the memories they and similar recurring events revive that are of interest. This particular incident harks back to the turn of the century reviewed so feelingly by Mark Sullivan. It stirs recollections of the old picnic days of popcorn, peanuts and panocha. Those were the days in which the open bench trolley car, decorated with American flags by day and illuminated with colored lights by night, was a thing of wonder, when every car used for a picnic carried a cop and every other car a band, when the street urchins, marauding at night, found great pleasure in pulling the trolley pole off the wire, giving every Jack a chance to kiss his Jill, and when motorman and conductor lugged a ponderous fender from one end of the car to the other at the end of the run. Excursionists picked daisies by the roadside when power went off the line. It was about this time that Ellis Parker Butler used the interurban as the peg on which to hang his story "Pigs Is Pigs" and every mud gutter band murdered "El Capitan."

But the problems presented in those days with respect to transportation were very much the same that they are at present. It was not infrequent in the nineties for the chairman of the picnic party to estimate that several hundred would need accommodations, only to find at the last moment that this number had been greatly swelled. It was so in the recent case at Youngstown. The first estimate was that about 500 would attend, but every day brought reports of an increase in number, until the night before the outing those in charge of it telephoned that about 1,200 were expected. This figure eventually was swelled to 2,100, but that did not phase the management any more than did the changes which were made in the old days. Considered from the vantage point of the present the methods of the turn of the century seem haphazard, indeed. Twenty years from now, however, the refinements of today may seem no less crude than do the methods of the late nineties, confined as they were then almost entirely to catering to the handling of chowder parties and the Schützenverein. The idea is the same. It is the execution that is different.

Much May Be Gleaned from the Layman

SALESMANSHIP is an art, the perfection of which requires more patience than petulance, more brain than brawn, more intuition than investigation and more contemplation than conversation. Whether efforts are concentrated upon product or personality, the crux of selling lies in personal conviction followed by a forceful telling. Everyone is engaged in telling this old universe something. Why can't the railways carry on the tradition of Chaucer's pilgrims and intrigue their patrons with the romance of riding?

Since the passing of the public-be-damned philosophy the stage has been set for a real selling job in the railway field. Unfortunately, some of the actors in the cast were insufficiently conversant with their rôles, while others, in their efforts to master the mechanics of their parts, missed the opportunity for finesse and art. Gradually these faults are being corrected and a new troupe is coming of age which bears as little resemblance to the old as perhaps the present-day transport methods will bear to those in vogue in twenty more years.

For his "layman ideas" and things which "smack" of the salesman C. S. Stackpole, whose address is published elsewhere in this issue, need offer no apology. It is to be regretted that it was not possible for every railway manager and his lowliest subordinate down the line to hear "what electric railways could do to sell transportation" from the point of view of an habitual rider. The regular car rider is well qualified to philosophize on "selling transportation." In fact, much might be gleaned from a perusal of its pages if the collective experience of car riders were set down in a book under the title "Memoirs of an Habitual Car Rider."

A Game Everybody Wins

MORE and more it is evident that the old game of consigning the public to the region of sulphurous gases and dancing imps is obsolete from the standpoint of the public utility. It was a dangerous game. It was like bluffing a poker player who holds a royal flush. The public at times may appear a trifle dense, yet there has never been any evidence that it lacked power when it is fully aroused. When it is bucked, it bucks. On the other hand, when called in as a consultant it often diagnoses the ills in a far better way than those who request its services.

Two outstanding examples of the value of the public as a consultant were recorded in the JOURNAL last week; one, editorially, in the matter of the Kansas City Public Service Company adopting recommendations from the Municipal Art Commission for a color scheme for its rehabilitated cars, and the other a news story dealing with the rehabilitation of rolling stock by the Utah Light & Traction Company. In the latter case this company went straight to the public, after first having produced a model car along the lines which it thought best for its patrons' comfort and from the standpoint of practical operation. It then sent over the city streets this powerful example of its willingness to provide better service, calling for suggestions as to improvements. These were forthcoming and were incorporated in the final design for the ten

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car bodies and five trailer bodies recently placed in service. This was playing a game in which everybody wins and was changing the sulphurous gases of yesterday into the perfumes of Araby.

A Case Not So Easy to Judge

LEGAL action may follow rejection by the New York Transit Commission of the application of the New York Rapid Transit Corporation to sell to the Brooklyn-Manhattan Transit Corporation $20,000,000 of its 5 per cent refunding bonds at 80 per cent of par, or $16,000,000, the proceeds to be applied principally to the purchase of 150 new cars. Whether or not the case reaches the courts, the points involved cover some nice distinctions in intercompany relations and corporation finance, since the New York Rapid Transit Corporation is owned entirely by the Brooklyn-Manhattan Transit Corporation and its subsidiary, the Coney Island & Brooklyn Terminal Company.

The opinion of the commission in the case as reviewed covers eleven typewritten pages. It is not possible to go into all the intricacies of the matter. The companies appear to be just as sure of their position as the commission is of its stand in the matter. In furtherance of its position the petitioner, among other things, challenged the right of the commission to inquire into the reasonableness or merits of the proposed sale, claiming that this amounts to substitution of the judgment of the commission for that of the board of directors.

On the other hand, in the judgment of the commission, that case does not apply to the exceptional conditions that here exist, conditions made so by the fact that city money is tied up in the construction of lines on which the equipment is to be used and the further fact that recapture of some of the lines by the city appears to loom ahead as a possibility in the situation. The city contends that the needs of the petitioner should be met by the sale of refunding bonds of the Brooklyn-Manhattan Transit Corporation. It seeks to make the point that on the basis of a sale at 95, it would require only $16,842,000 of these bonds to yield the money now needed by the petitioner as against the $20,000,000 of bonds proposed to be issued for that purpose. Among the alternatives it suggests is an issue of car trust certificates. The commission also holds out for the sale of bonds by competitive bidding. The Brooklyn-Manhattan Transit Corporation contends that the sale of its first and refunding bonds at this time would constitute a breach of faith toward holders of the 6 per cent bonds. This is only another part of its case.

The issues involved are technical, too technical for the layman to understand. On that account it is unfortunate that even papers that should know better have not hesitated to intimate that in standing out for what they consider to be their rights, under the circumstances, the Brooklyn companies are attempting to indulge in sharp financial practices at the remote expense of the city and its car riders. It is, of course, easy to jump to the wrong conclusion when to do so is in keeping with a disposition to pander to public appetite, always willing to believe the worst where corporation activities are concerned, but it is particularly reprehensible to do so in a case in which technical and legal issues are involved. Fairness would dictate that comment adverse to either side be reserved until the matter has been finally adjusted. There will be plenty of time then for censure, if censure of one side or the other is deserved.

Baltimore Decision a Victory for the Skip-Stop Plan

WITH the recent order of the Public Service Commission of Maryland permitting the use of the limited-stop plan in Baltimore comes a notable victory for this plan of operation. The case was one of the most carefully prepared and hardest fought since Cleveland made its sweeping all-day skip-stop installation and ended only after numerous hearings had been held. The plan which was adopted by many electric railways during the war was intended primarily to save fuel. At the end of the coal scarcity many railways reverted to the old system, while others continued to use the new plan for some time afterward. Its popularity waned, however, and at present it is in effect in only a few of the larger cities.

It has been proved that limiting the number of stops speeds up service. Speed is a vital factor today, when so many people in large cities commute from outlying suburban districts. In Baltimore it was shown that for 6,000 car movements of one day there was a saving of more than 18,000 car minutes, or about thirteen car days due to limitation of stops. This saving is greatly appreciated by the car-riding public. Moreover, movement of general vehicular traffic is facilitated under this plan.

The company benefits by a certain reduction in operating costs. For example, it takes more electrical energy to start a car than it does to run it a quarter of a mile. By eliminating useless stops a substantial monetary saving is made. Operating economy is accomplished also by the reduction in the number of cars required to provide equivalent service and by the decrease in maintenance costs of both cars and track.

Practically the only argument against the plan is that some persons are inconvenienced by having to walk farther to reach a car stop. Unless the number of stops per mile is reduced too much, the additional walk required by any patron is a very slight inconvenience and is more than offset by the additional speed and safety obtained. The convenience of the street car riders as a whole should be considered and not the so-called "hardships" endured by a few. Elaborate computations submitted to the Maryland commission during the recent Baltimore hearing showed the average distance walked by residents of typical blocks by reason of the limited-stop plan to be 157 ft., which could be covered in 36 seconds!

In establishing the limited-stop plan, however, wise choice must be made of stops to be eliminated. In business and heavily populated residential districts fewer stops should be skipped, while in outlying districts a stop spacing of four per mile has been found sufficient in some instances. Street obstructions and offsets, bad grades, heavy traffic crossings and intersections where there are traffic officers or signals often are a source of trouble, and opinions vary as to the elimination of stops at such points. Criticism of favoring certain streets can be met by using the staggered system, stopping at certain streets in one direction and at different ones in the opposite direction.

At this time, when traffic congestion is causing an ever-increasing number of delays to street car operation, any practicable method of speeding up the service merits careful consideration. Encouraged by the recent Baltimore decision, other railways may be expected to seek permission for the installation of the limited-stop plan.

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Electrolysis Mitigation

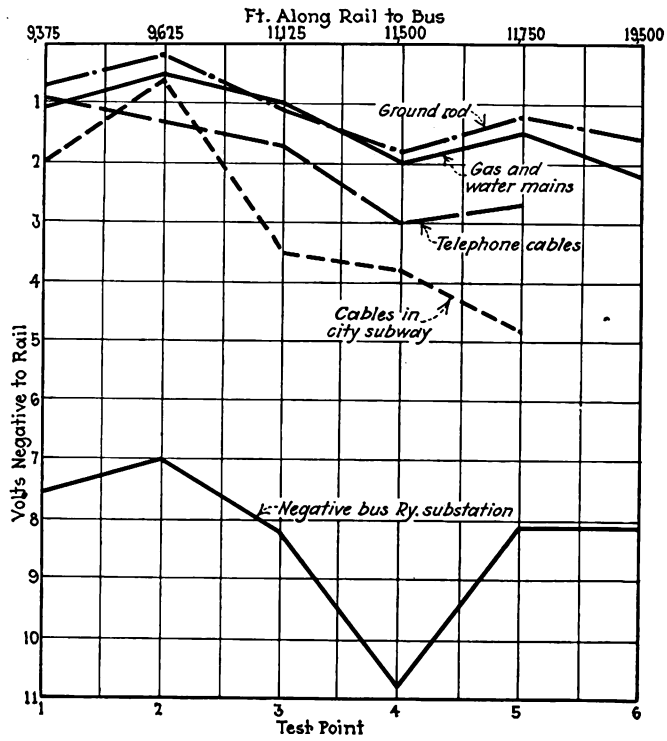
in Baltimore

Surveys made by joint committee representing principal interested parties used as basis for recommendations which have eliminated many causes of trouble

By H. Carl Wolf
Chief Engineer Public Service Commission of Maryland

CO-ORDINATED planning of underground structures, co-operative action on nitigative measures and a pooling of forces for studying conditions and effecting improvement by all agencies in the city interested in the problem have resulted in an actual decrease in the number of failures attributable to electrolysis in Baltimore, even though a marked expansion of underground structures and a duplication of points where electrolytic action might have been expected have taken place. For the past five years the Electrolysis Survey Committee of Baltimore City has been the medium through which just such treatment has been applied. On it are represented three municipal departments, the local railway and an interurban electric railway, a steam railroad, the local gas and electric company, two telephone companies, two telegraph companies, a power company, a pipe line company and the Public Service Commission. The writer acts as chairman. This body has no official standing and no authority to enforce any of its decisions, but the spirit of mutual confidence that has been engendered through the very existence of the committee would make it worth while even if no improvement in conditions had been effected.

The United Railways & Electric Company operates a 600-volt direct-current rail return system with tracks covering pretty generally the streets in the city and extending out into the suburbs in all directions. The Baltimore & Ohio Railroad has an electrified tunnel extending for about 1 mile through the business section and operated at 600 volts direct current. The Washington, Baltimore & Annapolis Electric Railroad has a short stretch of line in one section of the city operated at 600 volts d.c., changing to 1,200 volts d.c. outside of the city limits, where it parallels gas and water mains for several miles. The Consolidated Gas, Electric Light & Power Company operates a 110-220-volt, three-wire, direct-current network in the business section. The electric, telephone, railway and telegraph companies and the municipal fire department have extended systems of underground and overhead cables covering every section of the city, while a water power company has certain transmission feeder cables through a portion of the city. The conduits, with the exception of those used by the Chesapeake & Potomac Telephone Company and the American Telephone & Telegraph Company, are built and maintained by the city through the agency of its Electrical Commission. This system is being rapidly extended, and as conduits are built all overhead wires on streets must be removed. The water bureau and the gas company have comprehensive pipe systems in every direction. The Maryland Pipe Line Company has a short stretch of line through which oil is piped into the city, forming a part of its transcontinental system.



Instantaneous potential readings between railways and other structures

The effect of neighboring structures is reflected in the uneven slope of the curve of over-all potential gradients. Potentials between structures are indicated, as are points where electrolysis faults might be expected.

The first question that presented itself to the committee was whether or not a general survey of electrolysis conditions in the city should be made as a starting point for future work. It was suggested that the National Bureau of Standards be asked to assist in the work and that the cost be borne by the underground-structure-owning agencies in proportion to the amount of equipment owned by each. From a cursory review it appeared that conditions were not as bad in Baltimore as in some other cities, hence it was decided to make first a compilation of all the information collected by the various agencies in the city which had been studying the problem during the past few years. Accordingly, maps were

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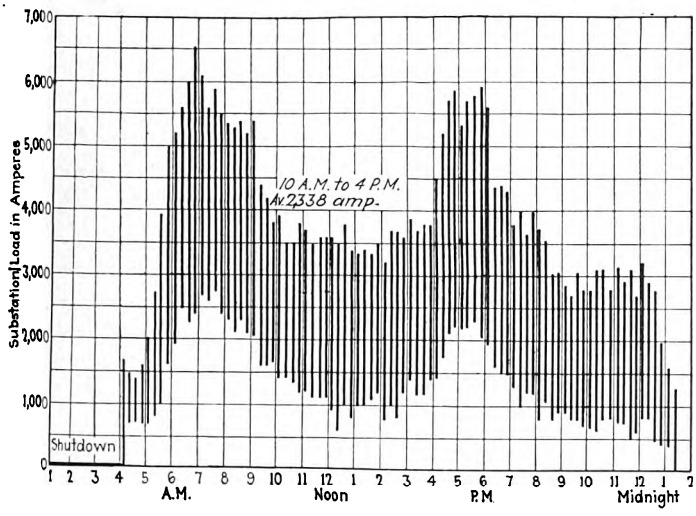
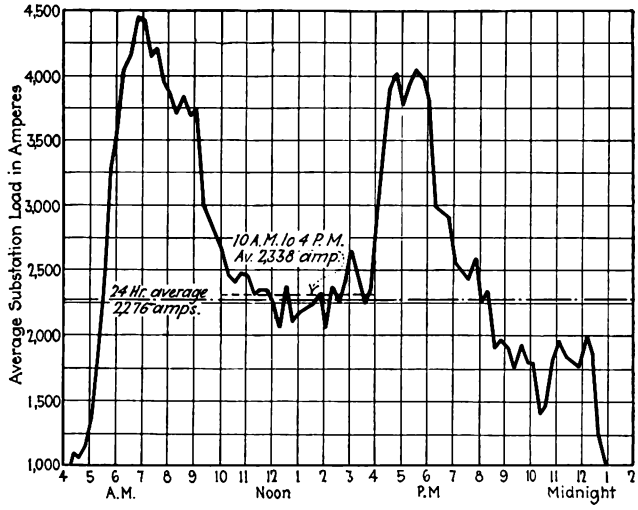
prepared showing potential readings taken during the previous years by each agency and indicating points where failures due to electrolysis had occurred. Other pertinent data were assembled. From these it appeared that there were only two sections of the city in which really dangerous conditions existed, and it was in these sections that practically all failures attributable to electrolysis during the past few years had occurred. Continual changes in the underground pipe and cable systems were causing such rapid shifts in drainage paths and in rail potentials that it was deemed advisable to concentrate on these sections rather than to undertake a comprehensive survey of conditions throughout the city.

A sub-committee was formed, consisting of technical assistants from the water department, the Electrical Commission, the railway company and the gas company, under the leadership of F. T. Iddings of the local telephone company, whose name in this section is synonymous with electrolysis, and a detailed survey begun of one section in the eastern part of the city, in which the worst conditions had been found. The recent joining



Characteristic maximum and minimum substation load chart by fifteen-minute periods

The uniformity of the load between 10 a.m. and 4 p.m. and the small difference between the 24-hour average and the 10 a.m. to 4 p.m. average indicates that instantaneous readings spread over a period of several minutes during any hour from 10 a.m. to 4 p.m. will give a fair indication of average results throughout the 24-hour period.



Characteristic average substation load chart by fifteen-minute periods

together of two previously isolated water systems, the rapid development of all underground systems due to industrial expansion and an absence of comprehensive mitigative measures all pointed to the advisability of the survey in this section. Later other areas were studied in a like manner and mitigative measures agreed upon by members of the committee. Measurements were made of the potential gradient of the rails and the instantaneous potential differences between all structures at strategic points, and these were plotted against the railway loads. In some places where great potential differences were found the current being returned by the underground systems was measured. The telephone company, on its own initiative, has for some years been making a general survey of electrolysis conditions over its cable system, which covers practically the whole city. This survey during the last year was extended to all underground structures in the vicinity of the company's cables. In this way a fair picture of conditions generally was found.

Results of the studies and surveys of the sub-committee are laid before the general committee and made available to all parties concerned. Any recommendations made by the sub-committee are considered and passed upon by the general committee and a method of procedure decided upon. All problems are approached with a spirit of co-operation, and for this reason no vexatious questions tending to halt improvement in conditions nor any problems which were incapable of solution have yet arisen before the committee. Some troubles attributed to electrolysis have been found to be due to other causes. Mitigative measures have generally fallen into three classes—co-operative construction, proper drainage and construction of automatic substations by the railway company.

Before any construction of any importance is undertaken by any company or city department plans are first discussed in committee meetings; where it appears likely that electrolysis conditions will be unbalanced changes are suggested, and where changes appear impracticable mitigative measures are provided for. Studies in the area affected are taken both before and after the construction is completed. The railway has evinced great willingness to supply adequate drainage wires and the other co-operating agencies have freely availed themselves of this privilege. The Electrical Commission has co-operated by making available duct lines for interconnections between structures and for drainage lines as needed. In some cases overdrainage has been found to result, due to shifting conditions. Each of the agencies involved provides a certain amount of drainage for its own system. All of these drainage wires are being made a part of the general drainage system.

The United Railways & Electric Company makes a continual investigation of the condition of its bonds, classifying them as good, defective and open. For the past few years more than 98 per cent of all bonds in the city have been found in good condition. This is a potent factor in reducing electrolytic losses. The company has also adopted a program for the installation of additional substations—all automatic—their locations being worked out as far as possible to improve electrolysis conditions. Four such stations, each of 3,000 kw. capacity, are now in successful operation and others are contemplated for the near future.

Pipe joints and insulating rail joints have caused some little annoyance, due largely to the uncertain con-

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ditions which they produced before the committee started to function. The removal of insulating joints on either side of a submarine cable and a provision for additional drainage eliminated one case of electrolysis which had been troublesome for years. Cement joints used in gas pipes have been found to result in some flow of current between gas and water pipes; in one case 12 amp. was found passing through a bond in the basement of a residence. It is believed that leadite joints in water pipes cause a very uncertain condition, due largely to the rapid decrease of their resistance with age. At one point insulating rail joints were placed several years ago to protect an 84-in. riveted steel water main which drainage had failed to render negative to earth. It was thought that the earth near the main would be polarized and be rendered positive, but after an extended trial the beneficial effect upon the polarity of the main was found to be negative, while the general effect upon the pipe and cable systems was adverse. The insulating joints were subsequently removed.

Good Results Have Been Obtained by Use of Small Cast-Iron Water Pipe

It is evident that some method for the physical protection of water, gas and underground telephone services which closely approach other structures should be developed. With the rapid expansion of the pipe systems and the meeting of their services with small telephone block cables at very vulnerable points it is not always expedient to supply proper electrical protection to these small ends, yet if either system is better drained than the other, damage is certain to result and remedial measures are hard to apply. The water department is resorting to the use of cast iron for services of 2 in. and over in order to reduce the conductance and the liability to damage. It is true, of course, that damage to services and block cables is not as serious as that to feeder and transmission systems, but it can, nevertheless, be very troublesome.

The many failures that occur as a result of conditions which have been existing for years make it apparent that the results of the committee's work cannot be measured for some time to come. Certainly it is true that Baltimore is remarkably free of electrolysis troubles, but it is the aim of the committee to effect even greater improvement, inasmuch as the damage done by electrolysis is in no way measured by the number of failures which occur. The co-operative method which has been the rule in Baltimore for the past five years ought to commend itself for the attacking of this vexatious electrolysis problem in other cities.

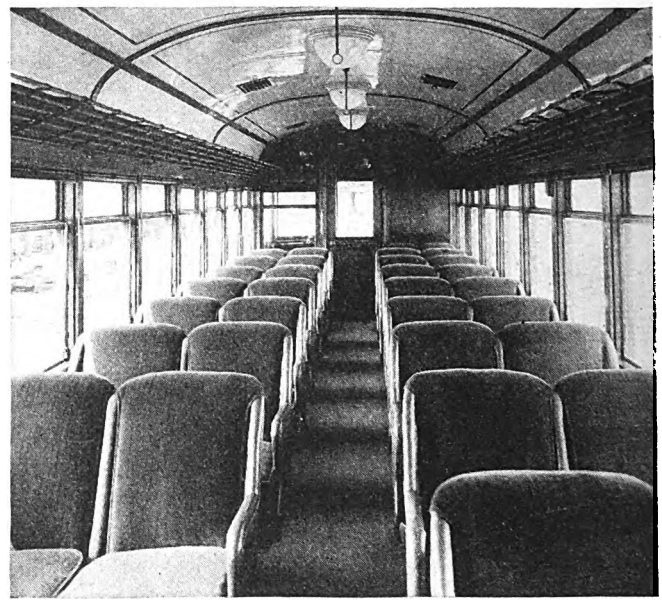
Atlanta Employees Own Homes

SOME 32.6 per cent of trainmen employees of the Georgia Power Company, Atlanta, Ga., own their own homes, according to a recent survey. One trainman, the survey revealed, worked for years paying for a home. A few days after the last payment had been made it burned down. Undaunted, he built a brick bungalow on the site of the old home and is now paying for it. Another trainman has eleven houses in the city which he rented for a good income. Practically all of the home owners bought or were buying their homes on time.

De Luxe Cars Placed in Service on North Shore Line

WHAT is another innovation in riding comfort for passengers at regular rates has been introduced on the Chicago, North Shore & Milwaukee Railroad, the North Shore Line, with the placing in service of three de luxe type passenger cars on the run between Chicago and Milwaukee.

The outstanding feature of these cars is the installation of individual bucket type seats upholstered in a gray Byzantine plush. Cars with this same comfort feature are also being used on the Chicago, South Shore & South Bend Railroad, or the South Shore Line, and



Type of de luxe appointments placed at the service of patrons of the Chicago, North Shore & Milwaukee Railroad. Three cars thus fitted are now operating between the terminals

delivery of similarly equipped cars to the Chicago, Aurora & Elgin Railroad was scheduled for August this year.

Each car has 51 individual seats. Interior decorations are of natural mahogany, with white headlining. The main compartment floor is equipped with battleship linoleum. Cut off from the main compartment in each car is a smoking compartment, with flooring of rubber tiling.

All the units are equipped with motors and embrace the latest safety devices. Both electric and hot water heating systems are installed, with thermostatic control for maintaining an even temperature in cold weather. Auxiliary battery lamps insure proper illumination at all times. Another feature is the painting of the exteriors in light shades for the purpose of making visibility tests. The predominating color is orange, with green and brown trimmings, largely reversing the present color scheme of green bodies and orange trimmings. Officials of the company are making these tests with a view to ascertaining the color scheme which will insure the greatest measure of safety in operation.

"Placing of these de luxe passenger cars in service is in keeping with the policy of the North Shore Line to give its customers the best possible service," said General Manager John F. Egolf. "Our aim is to combine speed of operation with the utmost convenience and comfort for our customers."

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No-Report Claims the Bane of the Claim Department

By Seth W. Baldwin
Attorney the Connecticut Company, New Haven, Conn.

IN STREET railway parlance a "no-report" claim is one made against the railway about an accident which has not already been reported to the proper officers of the company by any company employee. It is the despair of the trial attorney of the company and a bane to the claim department. It is also an enigma to the safety department and supervising force.

Safe practices are often worked out upon the basis of information derived from accident statistics, but statistics upon no-report claims are about as solvable as a Chinese cross-word puzzle.

There may be the accident which should have been reported, but upon which no claim is ever made. Obviously this should be included in accurate statistics, but never is. There may be the accident which first comes to light when suit is brought against the company and, depending upon the statute of limitations, this may be as long as six years after the accident. Thus the time element enters to confuse the situation. The claim may be entirely "faked" or greatly exaggerated, so that its statistical value is impossible of determination.

It is therefore almost impossible to deal with this no-report problem on a strictly statistical basis. It can be attacked only from the standpoint of personal instruction and personal contact.

New employees must be taught the great importance of reporting all accidents on or near their cars or work, and this same thought must be kept ever present in the minds of the older employees.

It is a well-known principle that the interest of a "boss" in any particular matter keeps the attention of the men whom he is supervising directed upon that same subject. This is true all the way through an organization, through the small groups, and up to the president and his staff. The no-report claim situation is of enough importance so that presidents of street railway companies should be interested and obtain and use all of the statistical information available.

Depending on the size and make-up of the company, this may be done by monthly reports, prepared by the general claim agent from information furnished him by his divisional claim agents and forwarded to the president through the proper channels. A sample monthly report may be as follows:

Dear Sir: I list below "no-report" claims for the month of , 1927:

Division	Number Brought	Number Settled	Cost
A	1	0	0
B	5	4	$187.00
C	0	0	0
D	0	0	0
E	2	1	20.00
F	0	0	0
G	0	0	0
H	0	0	0
I	0	0	0
J	2	1	4.00
K	0	0	0
Total	10	6	$211.00

Richard Roe,
General Claim Agent.

By this system each divisional superintendent, in cooperation with his divisional claim agent, knows his own situation in this regard, and also that even in the president's office comparisons are being made.

For instance, in the report given, Division B would undergo some questioning for its bad showing.

No-report accidents are of two kinds. There is the accident which some employee observes, or ought to observe, and does not report, and there is the accident which is unobserved by an employee, and properly so.

In the first kind, if the employee who should have reported the accident can be located, further special instruction, reprimand or discipline should be administered as circumstances warrant. The particular crew involved may often be found from the description of the claimant, as to time, place, car number, personal appearance, etc.

In the second kind there is no fault, so no blame should be placed. At times, through unusual circumstances, an accident of this nature is reported, and when this occurs, unusual praise should be awarded. I have in mind an instance where an intending passenger ran across the track behind a moving southbound car and also behind a slowly moving northbound car and fell in attempting to board the latter. The position of the conductor of the northbound car was such that he could not possibly see the accident, and as there was no outcry he was unaware of it. The conductor on the southbound car just happened to see the incident, signaled his car to stop, ran back more than a block and obtained the information for a report, including witnesses' names. He deserved and received special praise.

It may be said that the reduction of no-report cases is more of a financial than of a safety matter. Comparatively speaking, this is probably true, but one side of it has a material bearing upon service and safety. The attempt to reduce the number of no-report cases is basically an attempt to make all employees thoroughly honest, and there is no better basis upon which to build safety and service than a thoroughly honest group of workers.

In this regard, a word of warning is needed to any safety workers who have their eyes so intently focused upon safety as to miss other essentials of service. In safety work it has become customary to stage various kinds of contests based upon the results of reported accidents. The desire to win the contest is sometimes so great as to lead contestants to attempt concealment of accidents in which they may become involved. This not only creates no-report cases but makes the foundation of the whole contest dishonest. If the men in the contest learn about it—and the chances are that they will before the judges do—the respect of the sincere and honest employees for the safety contest will be lost. If safety contests are undertaken extraordinary care must be exercised to see that each and every accident is reported.

Perfection is rarely attained in this world. However, that does not prevent street railway companies from doing their best to reduce the number of no-report accidents. The best suggestions toward this goal are, first, thoroughly to inform the new employees of the importance of reporting every accident and every incident which a claimant in his greed may exaggerate into an accident, and, second, have the whole organization, from the men up to the president and from the president down to the men, constantly realize that while this is a very small part of their work, as far as time is concerned, it is really of very great importance to the company.

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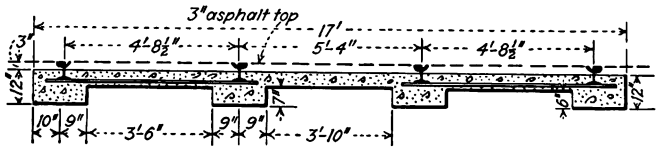
Track Cost Reduced with Steel Ties

By W. S. Tabor
Engineering Department, Alabama Power Company, Birmingham, Alabama

STUDIES of street railway track construction and paving made by the Alabama Power Company in 1926 resulted in the development of new designs which are less expensive than those formerly used. The present standard type for ordinary track is suitable for any rail section and may be paved with granite block, brick, asphalt or concrete. In most of the cities where this company operates street railways solid concrete paving is preferred by the city engineers.

For ordinary track we use a thin steel tie with patent clips formerly used for light rails and narrow-gage mine and industrial open tracks. When ties are imbedded entirely in concrete, they function only in a horizontal position to hold the rails to gage and the vertical loads are carried entirely by the concrete. The section of steel we use is $\frac{3}{16}$ in. thick corrugated to $\frac{3}{4}$ in., 5 in. wide by 6½ ft. long. This shape allows easy access to place the concrete underneath. The rail fastenings are the out-

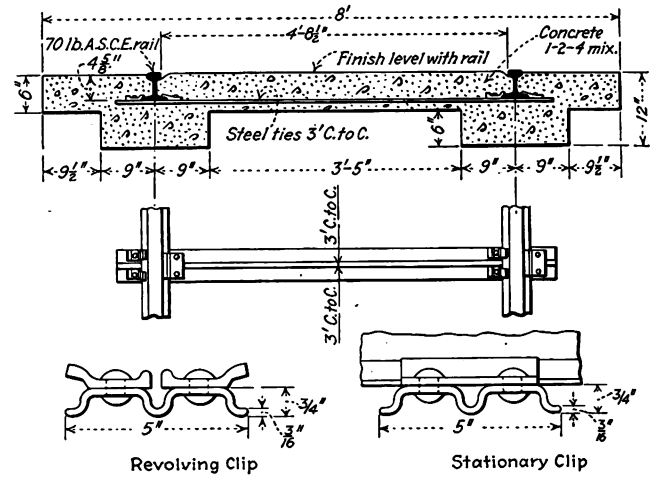


Design for double track in city streets where traffic is heavy

standing feature of the tie, being always in place and ready for use. Stationary clips are placed on the inside and revolving clips on the outside of the rail. By welding a tie to rail at proper intervals it will serve as a cross bond. This tie is manufactured by the Bethlehem Steel Company. Its weight is 26 lb. and it can be punched to fit any rail section. We constructed some of this type in 1926-27 with gratifying results both as to cost and appearance, using 70-lb., 80-lb. and 85-lb. A.S.C.E. rail, also some 90-lb., 7-in. grooved girder rail.

The usual practice followed in construction for 70-lb. A.S.C.E. rail is to excavate a trench 12 in. deep and 18 in. wide centered on each rail, and a section of 9 in. outside of each rail 6 in. below finished paving, also a center section 6 in. deep by 3 ft. 6 in. wide. When the ground will not stand by itself, form boards are used in the trench. Excavation being completed, rails are placed on wood blocking, ties are attached and the joints are welded, then surfaced with hardwood wedges and nailed to blocks, which are left in place. The concrete is a 1:2:4 mix, using Portland cement. This is poured in one course and thoroughly tamped under ties and rail. Our rail joints are thermit-welded on compromise joints at special work and electric seam-welded elsewhere.

One of the first stretches of the above type constructed was 2,600 ft. of single track, the street gradient being a series of vertical curves approximating 8 per cent grades. A.S.C.E. 80-lb. rail was used. This work was carried out under exceptionally favorable conditions, suspension of traffic and fair weather. The actual construction cost was 30 to 40 per cent lower than types previously used. The writer recently made an inspec-

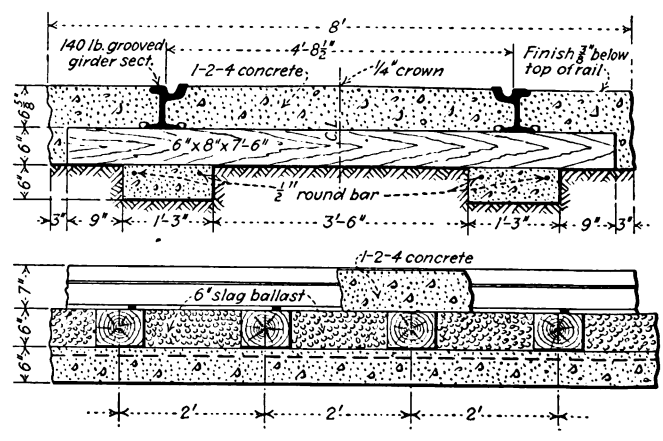


Standard track structure of Alabama Power Company is suitable for any rail section and block, brick, asphalt or concrete paving

tion of the above track and found it in perfect condition, cars riding smoothly and no perceptible difference as to noise, as compared with other types of construction. Indications are that maintenance costs will not worry the operating department for a long time to come.

The principal saving is due to the low cost of the tie and the simplicity of the track installation, which cuts labor cost and requires comparatively little excavation. Ties are placed on 3-ft. centers and the requirements for 1 mile of single track are 22 gross tons, while other types of steel ties commonly used ran 72-122 gross tons per mile of single track. The cost is also lower than treated wood ties with ballast underneath and concrete or brick surfacing.

For special work in connection with the above construction we are using mainly 7-in. GG 140-lb. rail section with treated wood ties laid on reinforced-concrete girders placed directly under the rails and a slag ballast filler or base for subgrade of paving slab, as shown in an accompanying drawing. The cost of this type is no more than ballasting under the ties and tamping and is more substantial. A settlement of the ballast invariably occurs when ballast alone is under the ties, allowing the rail to drive downward through the surface paving, causing fracture along the rails with early disaster to the paving. The concrete girder gives a solid support for the ties, and the only hammering down effect would be the rail base into tie, but with rail plates this would be negligible within the life of the special work.



Wood ties on reinforced concrete girders are used under special work

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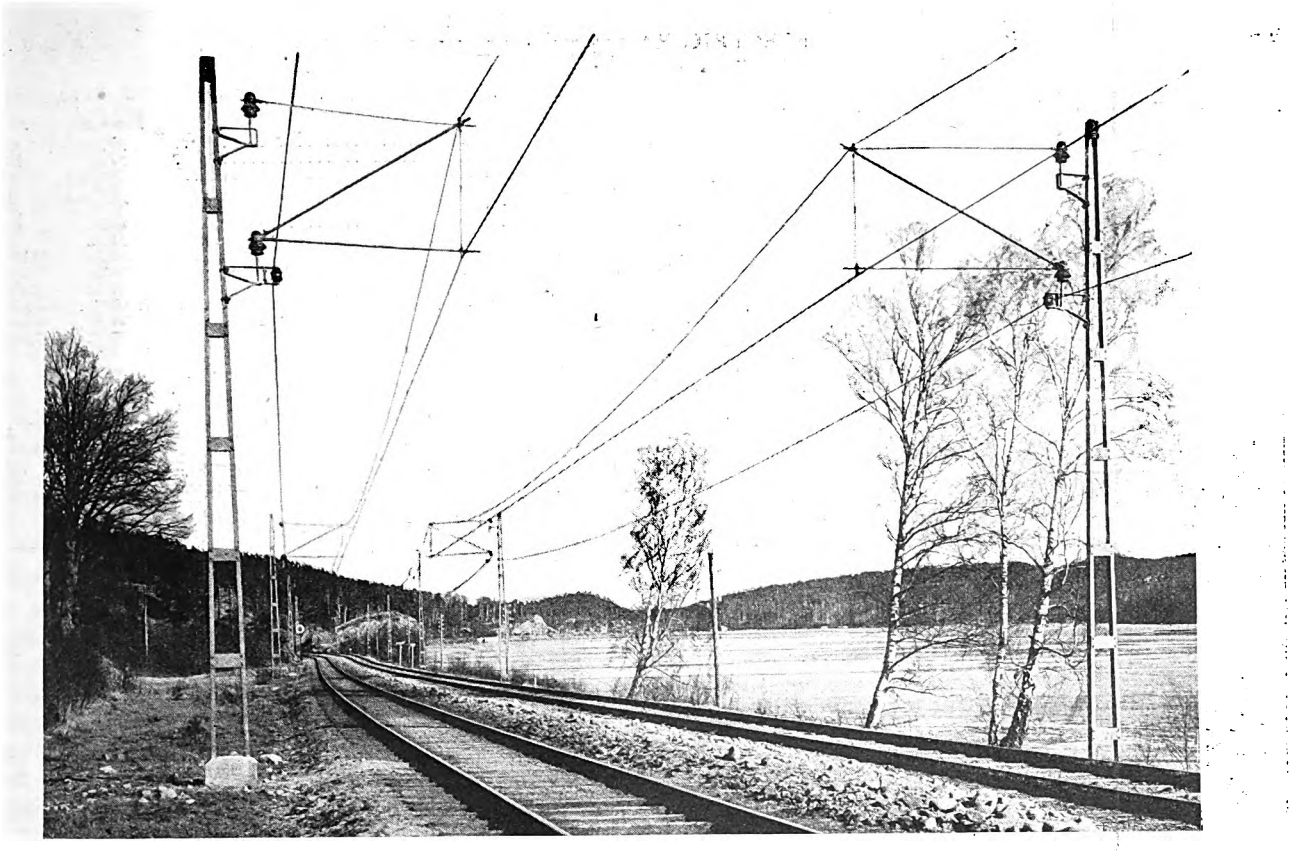

Overhead construction used on some double-track sections

Electrification of
Swedish State Railway Extended

By Kent T. Healy
Consulting Engineer, Natick, Mass.

THE recent electrification of the Swedish State Railway between Goteborg and Stockholm is a most significant development in the field of electric trunk line operation. It represents a very satisfactory solution to some of the major problems confronting the distribution of power at high trolley voltages and shows a high degree of design technique in the distribution system.

Hitherto it has not been considered feasible or advantageous to operate a high-voltage single-phase distribution system from a commercial high-tension power system. The Swedish State Railway was desirous of keeping the number of substations to a minimum and the amount of copper as low as possible, so that it preferred a high trolley voltage, such as 16,000, the standard in Europe for single phase. But the single-phase locomotives required a low frequency, while the commercial power system was 50 cycles. This necessitated frequency converters at the substations, which would also perform the phase conversion. Similar conversion would be necessary with direct current and the substations would have to be a good deal more frequent due to the lower distribution potential of 3,000 volts, and feeders would be necessary, so that as far as distribution economics was concerned single-phase distribution seemed to be the best. The other alternative was to build a single-phase transmission system, as was done on the northern section of the railroad. This, however, did not seem to be sound economically in the case of the Stockholm-Goteborg section because of the existing transmission net, which could readily supply the power and which could be aided considerably by bettering the load factor and regulating the voltage at various points.

The result of the decision to use the commercial system for power was the installation of five substations fed from existing transmission lines to supply power for 270 miles of railroad. These substations are built in units, with a 3,200-kva., three-phase, 50-cycle synchronous motor directly coupled to a 2,400-kva., single-phase, $16\frac{2}{3}$-cycle generator. On the motor side is a Tyrell voltage regulator, varying the field of the motor so as to feed necessary reactive amperes into the transmission line to correct its voltage. The unique feature of the low-tension apparatus for single-phase distribution is the arrangement in case of a short circuit or ground on the line. The feeder oil switch is set to open at

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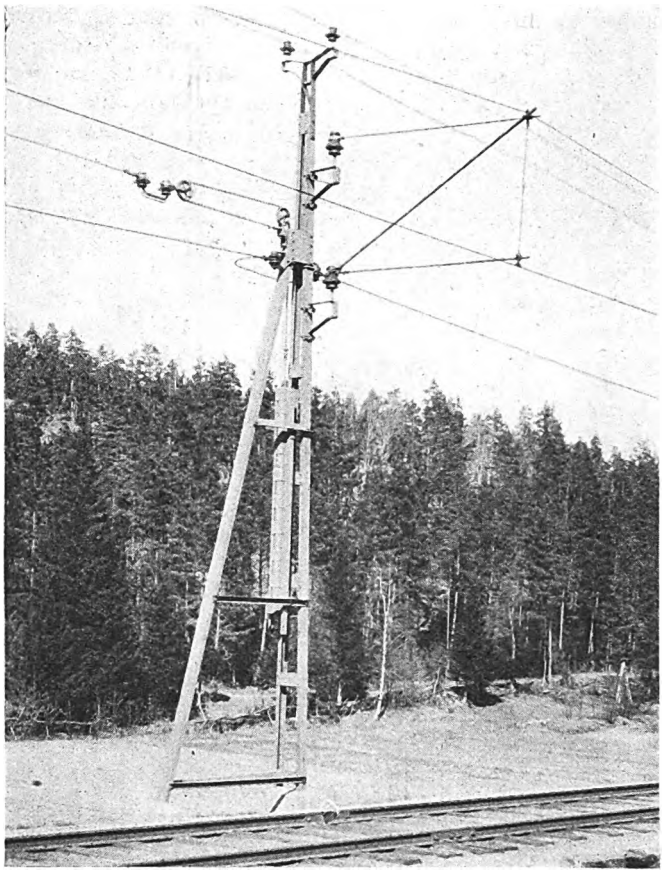


Lever arrangement for changing tension

450 amp. instantaneously. After opening, it closes back on the line in 30 seconds through a series current limiting resistance. If there is still a short it closes in again after a two-minute wait, and then remains open if the line has not cleared. Oftentimes, due to the high impedance of the line, a short circuit will not raise the current to that initial value, yet it is necessary to keep it set as high as that because of the possible demand for that much power by locomotives in the section. To circumvent this difficulty a low voltage relay is installed in the feeder, which lowers the opening setting of the current relay when the voltage on the feeder drops below a certain point. Normally the feeder voltage is regulated by a Tyrell regulator on the single-phase generator to remain at 16,000 volts.

The substations have two or three motor-generator units tied together by buses on both single and three phase sides. Each station feeds up to three sections of line. The operation of the equipment is automatic to a large extent. For starting the motor-generator a low-voltage bus is provided and for synchronizing a pole changer with six settings is used so as to get the proper phase relation on the single-phase side.

The track distribution system has a very interesting design. It is non-ferrous with a copper messenger of 98,000 circ.mil supporting a contact of copper of 156,000 circ.mil with copper hangers and brass and bronze fittings. The catenary is built in sections of 4,900 ft., fixed in the center and flexible longitudinally either way, being kept in tension at both ends by weights and levers so as to keep a tension of about 880 lb. in the messenger and 1,320 lb. in the trolley. With the expansion and contraction in summer and winter the position of the weighted ends of the catenary may vary as much as 3 ft. The stresses in the messenger and contact are

DIMENSIONS AND CHARACTERISTICS OF LOCOMOTIVES

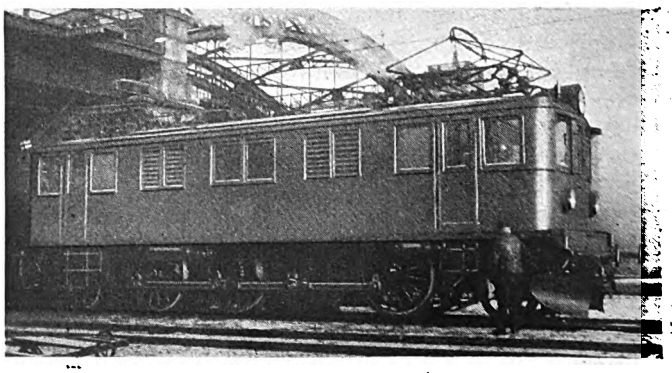
	Passenger	Freight
Length over buffers	43 ft.	43 ft.
Cab length	37 ft.	37 ft.
Cab width	10 ft.	10 ft.
Rigid wheelbase	18 ft.	18 ft.
Total wheelbase	31 ft.	31 ft.
Diameter of drivers	60 in.	60 in.
Diameter of guide	38 in.	38 in.
Weight on one driver	48,000 lbs.	48,000 lbs.
Weight on trailing wheel	30,000 lb.	33,000 lb.
Adhesive weight	112,000 lb.	112,000 lb.
Total weight	175,000 lb.	175,000 lb.
Weight of electrical equipment	63,000 lb.	63,000 lb.
Weight of mechanical equipment	112,000 lb.	112,000 lb.
Hourly rating of motors	1,660 hp. at 40 m.p.h.	1,660 hp. at 30 m.p.h.
Weight per horsepower	106 lb.	106 lb.
Hourly tractive effort	14,500 lb.	19,400 lb.
Weight per pound tractive effort	12 lb.	9 lb.
Maximum tractive effort	26,400 lb.	35,200 lb.
Power	16,000 volts	16⅔ cycles
Maximum speed	56 m.p.h.	43 m.p.h.
Cost, approximately	$60,000	$60,000
Cost per pound, approximately	34 cents	34 cents

kept uniform by an ingenious lever arrangement changing the proportion of the tensions given to one or the other as its length varies. The normal span length is 195 ft., with a flexible Z support at each pole or bridge location. This Z support is made of pipe and wire supported on two pin insulators and free to move around these as an axis. With cross-beam construction the support remains flexible, but is a little more complicated. No cross spans are used to support the catenary because of the greater security offered by the cross beams. For sectionalizing on high-speed tracks, air gaps are used, but in yard tracks an insulator section breaker with a metal wire running surface is used.

Current collection is performed by an aluminum shoe pressing with about 8 to 10 lb. pressure on the contact wire. The pantograph is designed very lightly and the shoe is attached to a small part of the pantograph at the top, free to move independently of the main body. This allows the shoe to follow the smaller irregularities of the contact wire nicely, so that there is very little sparking and a high pressure is not necessary to keep the shoe on the wire and collect sufficient current. With this low pressure, wear on the trolley is negligible. To avoid wearing out the shoe in one place the contact wire is run in a zigzag line, varying first on one side and then on the other side of the center line of the track as it goes from pole to pole.

The locomotives are extremely simple, the same model being used for freight and passenger service, with a variation of gear ratio. There are two motors, totaling 1,660 hp., geared to a jackshaft, which in turn delivers power to three drivers through the usual rods. The general characteristics of the locomotives are given in an accompanying table.

The electrical protective features of the locomotive are unique in that they are arranged to co-operate with



One of the 1,660-hp. express locomotives

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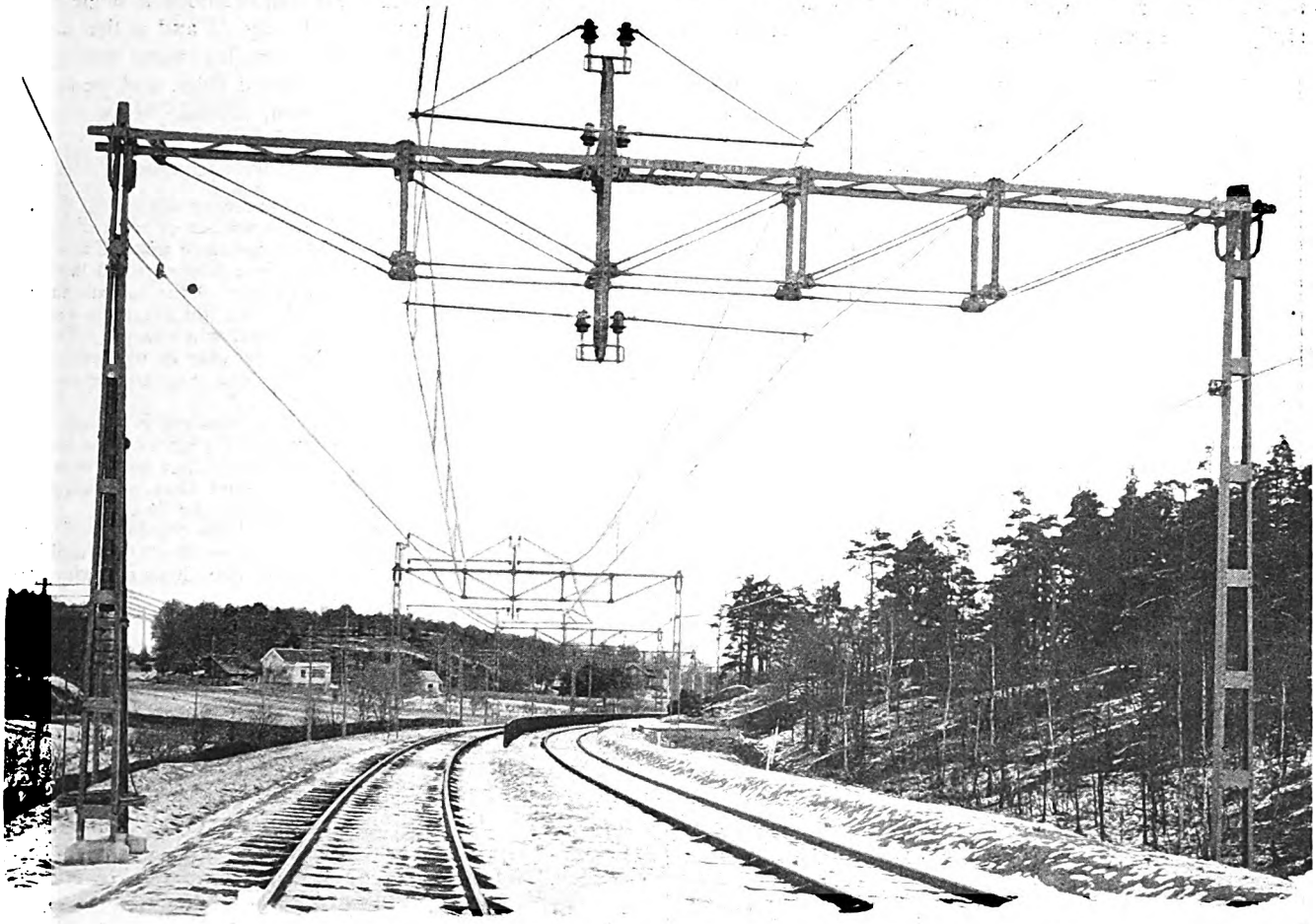
the feeder protection in the substation. The circuit breaker in the locomotive opens instantly on any short up to 200 amp. Above that it stays closed and waits for the feeder breaker in the substation to open. When the voltage drops to zero in the locomotive due to the feeder breaker opening, the breaker on the locomotive opens and clears the locomotive from the circuit, so that when the feeder breaker in the substation recloses the short is cleared off the line and the rest of the trains merely notice a short interruption of power for 30 seconds.

One of the outstanding features of the electrification from Goteborg to Stockholm has been the very satisfactory solution of the problem of telephone inductive interference.



Truss construction with double and separately insulated outriggers

The Swedish State Railway has been at work for a long time on this problem on its northern electrified section. The first steps there were the installation of a system at a 16,000 volts negative to that in the trolley to counteract potentials induced statically. This was worked out in conjunction with a transmission line for station lighting, but there were decided disadvantages in this method because of danger in case of insulation failure. In addition to this the rails were bonded and booster transformers with one coil in series with the rail circuit were installed. These boosters reduced the dynamic induction from 13 volts per 100 amp. per mile to 0.5 volts. However, with this series coil connection bonds were required and trouble was experienced in voltage drops in rails getting too high.

With the new system booster transformers were used at the ends of sections of the return wire and the rails bonded to this wire at the midpoints of the sections. This connection eliminates the need of bonds and keeps down rail potentials. The transformers are a one to one type with a voltage of 570 in the primary, corresponding to 2,200 amp. in the secondary. They weigh about 5,000 lb. The core iron is specially selected to prevent losses and to keep the magnetizing current as low as possible. With the capacity of the transformers high enough they can take care of the abnormal conditions of shorts very well. The return wire is a 257,000-circ.mil copper cable hung on the poles at the base of the lowest insulator of the catenary support. It was found in experimenting that the position of this wire in the vertical plane made considerable difference in the efficiency of the reduction of the induction. Tests in certain sections of the line with this arrangement of return wire and boosters showed 0.16 volts per amp.-mile induced in an open wire line averaging 1,300 ft. away from the track and 0.24 in a cable line 4 ft. away buried in the ground. All the communication circuits of the railroad have been cabled and buried. The commercial circuits too have been cabled and removed to highways. The railroad has had to stand two-thirds of the cost of all this, amounting to about $4,000,000.

The total cost of the electrification has been about $11,000,000 for 270 route-miles. Of this 11 per cent was for the substations, 34 per cent for the track distribution system, 28 per cent for the prevention of telephone interference and 28 per cent for the rolling stock. The substations averaged about $242,000 each, the catenary and supports $7,500 per track-mile and the locomotives $60,000 each.

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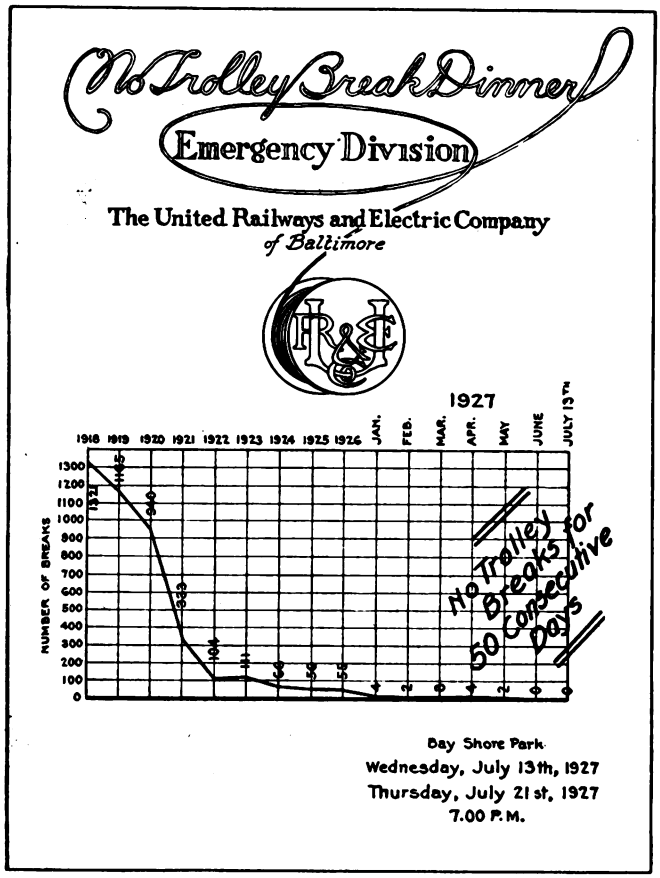
Trolley Break Record Made at Baltimore

In recognition of having gone 58 days without a single trolley break, a dinner was tendered to the men of the emergency division

FIFTY-EIGHT days and nights passed without a single break in the overhead trolley wires on more than 400 miles of line operated by the United Railways & Electric Company, Baltimore, Md. During that time 1,067,000 trips were made and the cars traveled 5,500,000 miles. This result was accomplished by a most exact study of the mechanics of the trolley, the trolley wheel



Cover of menu card for celebration dinner

and the wire and vigilant supervision, together with unceasing inspection of the overhead work.

There was a time when fallen trolley wires were so frequent that they were regarded as a necessary evil, the delays resulting costing many dollars. At that time trouble crews were stationed at advantageous points from which to respond with their trucks when news of a trolley break was phoned in. Now these crews have a more important function, which is the forestalling of trouble so as to prevent its occurrence. They have headquarters with some one on duty to receive reports and calls and forward them to the crews. These latter, however, are out on the line covering the whole system in systematic order, inspecting the overhead work and detecting any weak points which need replacement and strengthening. The record of trolley wire breaks for the United Railway system since 1918 is given in the accompanying table.

TROLLEY WIRE BREAKS ON UNITED RAILWAY & ELECTRIC COMPANY'S LINES FOR TEN YEARS

Year	Number of Trolley Wire Breaks	Year	Number of Trolley Wire Breaks
1918	1,321	1923	111
1919	1,165	1924	66
1920	940	1925	56
1921	333	1926 to	55
1922	84	1927 to July 21	15

When the month of June went by without a single break in the trolley wire, it was decided to give a dinner to the men of the emergency division. In order not to interfere with the division's work, the force was split into two groups and each group was banqueted on different dates. The first dinner was held July 13, and at that time 50 days had elapsed without a single break. The second dinner was held July 21 and at that date 58 days had elapsed without a trolley wire break. The dinners were given at Bay Shore Park and, besides the men of the emergency division, officials of the company were present.

Speaking of the record, General Manager Potter said:

We are now calling you the "emergency division." We used to call you "trouble shooters." But neither of these titles seems to fit you. Mr. Wennagel tells me we have gone 58 days without a trolley break. I think this is a better record than Babe Ruth's 30 home runs, because Babe gets to the bat only three or four times each game, and probably does not average a home run more than once in two or three games, whereas you fellows are going to the bat 24 hours a day, every day in the year. I cannot call you "pinch hitters"; I cannot call you "trouble shooters," and I cannot call you "emergency men."

They tell me that Napoleon used to win battles by anticipating any trouble that the other fellow was trying to cause him, and then acting before the other fellow did. That seems to be what you are doing—anticipating trouble—and that is what we are doing in the street railway game all along the line.

Napoleon's prize regiment was called the "Old Guard." From now on you are entitled to call yourselves the "Old Guard," and I wish I could pin a Distinguished Service Cross on each of your chests. We are all proud of you.

More Steel Cars in Rapid Transit Service in Brooklyn

THE last wooden car has been taken from operation on the Brighton Beach line between Prospect Park and Coney Island. An all-steel service is now being given. The Brooklyn-Manhattan Transit Corporation replaced its wooden car service with steel car service at the request of the Transit Commission, after a number of conferences at the commission offices beginning June 6. The wooden car service was operated in the evening beginning at 4:15 from Franklin Avenue and Fulton Street to Coney Island over the local tracks. The operation continued up to 6:15 p.m. In the opposite direction; that is, from Coney Island to Franklin Avenue and Fulton Street via Prospect Park, the wooden service was begun at 3.42 p.m. and continued up to 5:42 p.m. This service resulted in a mixed operation of steel and wooden cars over the same tracks, which tracks are not completely equipped with an automatic train stop device.

The commission has directed by formal order both the Brooklyn company and the Interborough Rapid Transit Company to equip their entire systems with automatic train stop device and the companies have accepted the order. Until the tracks are thus equipped and until it is determined whether or not a steel car of sufficiently light weight can be designed for operation on the elevated structures the commission is endeavorinng to put an end to wooden car operation wherever this can be done without seriously curtailing service facilities.

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You've Got the Goods—

Now Sell 'Em

When a railway has laid the groundwork for telling the world about its product by up-to-date, attractive cars and service, it is up to the trainmen personally to develop potential riders into actual customers

By C. S. Stackpole
Sales Manager Light and Power Department
Virginia Electric & Power Company

MR. STACKPOLE *talks to the railway men of his own company and gives his views on winning and retaining car riders. He was invited to address the transportation club, a study organization of the company, on "What Electric Railways Could Do to Sell Transportation." He prefaced his talk with a confession that these ideas were gathered in more than a year and a half of riding street cars over the Virginia properties, and with an admonition that some of the things would "smack" of the salesman "that just won't be kept down."*

YOU have spent lots of time and effort bringing our transportation service up to the point where it is safe, plentiful, regular, fast, clean and comfortable. You fellows have been the artists—a wonderful job has been done in a remarkably short time through the close co-operation and association of the old and the new. The painting is great. Now the picture must be sold. A demand must be created for it. Let's tell the world about it through salesmanship.

It is said, you know, that salesmanship is nothing more than spreading the gospel of personal belief. Once you feel the strength of conviction in your blood, you're out telling the world, and the force with which you tell your tale determines the value of your service as the bearer of good business tidings. There are two major factors of prime importance which must be considered in selling transportation. First, advertising; second, personal solicitation and salesmanship.

A corking job is already being done in advertising with the attractively painted street cars carrying attention-getting slogans, the excellently worded newspaper advertisements, pithy car cards asking patrons to "Rest, Ride and Relax" with you, but there you sort of come to a stopping place.

How many of you fellows in your travels have come out of a railroad station in a strange city and (assuming you're not on expense) desire to ride the economical way, by street car, to the center of the city? Lots of you, I'll bet. You find your way out of the station and behold there is a double-track trolley service and you have to find a friendly policeman or bystander to tell you which track the car for the business district runs on. Isn't there some way that a sign could be placed designating the spot where the downtown trolley can be taken, thus breaking down the resistance which causes the stranger more times than one to use a more expensive mode of transportation to save the trouble of inquiry? I believe it would be worth-while advertising. The sign might read, "Ride the Economical, Comfortable, Fast Way, by Street Car, Ten Minutes (or whatever it may be) to the Center of the City— Take the Car on This Side." You'd get many a transient now being missed.

Word-of-mouth advertising is used with great effect in many cases. We have the side show barker, the old quack medicine man, radio performers, and last, but not least, the taxicab driver. You are all familiar with the "Cab, cab, taxicab, mister! Anywhere you want to go," which may be heard in almost every city in the country. The taxicab driver is an aggressive advertiser and salesman. He sells you so thoroughly that if you are a timid soul you are almost shamed into buying his services. I do not believe that you would want to train your inspectors to yell musically "Street car, street car, street car, mister, ride the economical way." That's rather a mouthful, but wouldn't it be practical to have men whose duty it would be to meet all trains at stations, wearing somewhere on their uniforms, and easily seen, probably an embroidered statement worded something like this, "Ask Me About Street Car Service"? Their jobs would be similar to those of the floorwalkers in up-to-date department stores—who provide easily accessible information but ultimately, through their courteous and peppy manner, help sell more goods.

The greatest selling houses in the country today use what is known as the premium or gift idea to attract buyers to their places of business. Let's give some thought to this in selling transportation. A tiny replica of the street car with our insignia stamped or painted

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on it could be made, no doubt, for very little money. Why not pick out a certain day or days when every child between the paying age and ten years, let's say, who rides in the street cars during that period would be given this toy? Wouldn't that bring street car riding to the minds of the parents and at the same time please the child who is father of the man, who may help or hinder us in later years?

Direct literature contact is often compelling when used properly. Why wouldn't it be possible from time to time to use an attractively worded transportation pamphlet to be delivered with our light bills? Doubtless there are innumerable people who use their automobiles wholly for city transportation who are too busy driving their cars to read our cards and suggestive signs painted on the sides of the street cars, yet they might be sold on the convenience and economy of using our service if they received informative pamphlets in their homes.

Suggest House-to-House Calls by Trainmen

You may say that personal calls are all right for selling vacuum cleaners and electric irons, but not street car rides. Let me explain. When you open a new line, an extension of an old one, or put on the newest and most up-to-date equipment, what do you do? You advertise in the newspapers and have a parade of the new equipment. This is invaluable, but why not go a step further? Take a group of men who are outstanding in their appearance and personalities, give them a course of instruction and have them personally visit every home possible on the new line to explain the advantages of the service. Shortly, you will have the sensible persons saying, "There's a modern transport concern, so well sold on what it has to offer that it is soliciting my business!" A similar scheme could be worked out among the business houses that employ messengers, errand boys and others whose duties carry them all over the city.

Laborless Equipment Encourages Operator of the Salesman Type

Now we come to the personal salesmanship which covers a lot of territory. To make its use effective depends entirely on the little personal services rendered by the man behind the controller. We all remember when the operator of a street car had to be a great big bruiser, bulging all over with muscles in order that he might have the physical strength to hand-brake cars, open and close doors, and perform all the other heavy physical duties necessary. Today, electricity and air do all of these things. Comfortable seats also are provided for the operators to make for less fatigue and, therefore, less grouchiness. In other words, the stage is set for a real selling job.

Let's Check the Patrons' Parcels When We Can

All of you fellows probably know why the large department stores have started checking stations for customers' bundles and babies. It has been done indirectly to acquire good will, but directly to attract more prospects into the store and thus sell more goods. Their opportunity is ours in a little different way. When a patron, laden with bundles or luggage boards a car, let's get his mind away from his burdens in the very beginning by having the operator-salesman suggest the bundles be left on the floor in front. The rider may then go back and sit down comfortably without having a struggle finding room for his baggage. Some may protest: "But that places too much responsibility on our men." So it does with the department store employees, but apparently enough is thought of the selling value of the idea to keep on even though a bundle or a baby is lost occasionally. Anyway, I haven't yet suggested that we check babies.

I wonder if you fellows ever looked at that safety sign on our cars "Do not talk to the operator" and thought, assuming you were a passenger, "Well, if I can't talk to him, who in Hades can I talk to?" Just suppose a store had signs over the salespeople's heads reading, "Do not talk to the salesmen; see the floorwalker." You can imagine how long that store would remain in business. But that is absurd and not a fair comparison, you say—yet here we are asking our salesmen to keep quiet while opportunities may slip by. I appreciate the safety factor in the ruling, but when the car is in motion he can very easily keep his head to the front and very few will talk to him while the car is moving; at least, no more than at present, in spite of the sign. As a substitute for the present mandatory wording, I suggest the new very popular "Ask me another," or words to that effect.

The Thousand-and-One Touches That Count

And so I might ramble on for hours, suggesting many more little things, such as calling out the names of streets; assisting the old and infirm in boarding or getting off the cars; slowing down, when the car is full, to tell waiting passengers that the next car is coming right behind. Suggesting to the customer that a weekly pass is handy and economical; always smiling, neat, courteous, willing; thoroughly sold on the company, its ideals and its debt to the good folks who are its patrons.

It is always the little things that our customers see and criticise, favorably or unfavorably, according to the actions of our people. What a great thing it would be if we could get our men into a selling attitude so that they would actually feel conscious-stricken when they see people walking as an empty car rolls by. Why not take them even more definitely into the picture and get them to thinking "What can we do to sell more rides?" If more concentrated training and instruction along these selling lines are needed, wouldn't it be practical to employ an enthusiastic, imaginative, convincing, promotional director, with loads of personality, to sell these fellows on the opportunities their jobs present? It seems to me he would certainly be a distinct asset to the company.

We Should Be Salesmen Primarily

Now let me close with a rearranged version of our Mr. Lemmon's closing remarks in an address made here in Norfolk a little over a year ago on "The Universal Advocation—Salesmanship." At that time he said:

We are not in the business of manufacturing B.t.u.'s, car-miles, tons of ice or mousetraps, but of selling them at a profit.

Every man on the payroll from manager to vehicle operator is a salesman or an assistant to a salesman. He is there for no other purpose whatever.

Salesmanship, as distinct from peddling, calls for imagination. It creates new demands for old things.

There can be no sale—under any circumstances—without an appeal to one of the seven emotions to which the human mind is capable of reacting.

Unless we know more about the other fellow's needs than he does, and can point them out to him, there is no reason to suppose that he will part with real money for something he is unaware of requiring.

The names of the company, the personality of the employees, and the service which we render, must all be associated with pleasant pictures in the minds of our potential customers.

You say, "of course all of these things are obvious." True, but the rarest thing on the face of this earth today is timely recognition of the obvious.

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Nashville's New Cars

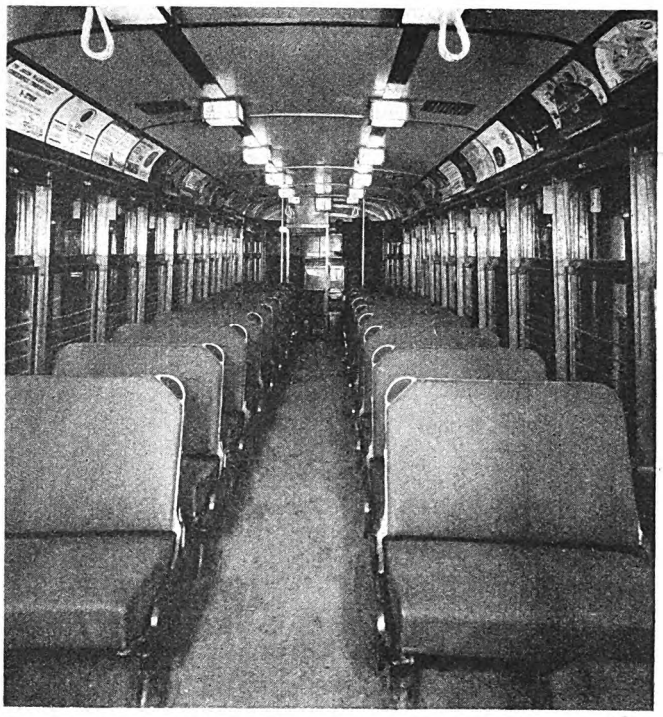
Features of the ten light-weight cars recently placed in service by Nashville Railway & Light Company at a cost of $150,000

WHEN the ten new de luxe street cars ordered by the Nashville Railway & Light Company were placed in service last fall the event was properly celebrated by an elaborate historical pageant, together with a motion picture display. The story was told in ELECTRIC RAILWAY JOURNAL for Dec. 4, 1926, page 1019, and Dec. 25, page 1139. Bought from the Lightweight Noiseless Electric Street Car Company, Minneapolis, these cars represent an investment of $150,000, which is the initial step in a program of modernizing the company's rolling stock. The cars were placed in service on the West End-Bellemeade division.

The low streamline body, arch roof and wide windows make the car attractive. A drop skirt extends around the bottom of the car body, partly concealing the trucks and wheels and reducing the noise made by the running gear. Double floors with a layer of wallboard between and a covering of olive-green battleship linoleum also aid in the suppression of noise.

The cars have double trucks and are of the one-man type. Fully equipped they weigh 29,000 lb. each. The dash is low and the fare box and a spring-cushioned seat are designed for the convenience of the operator. Easy access is provided through the use of 26-in. wheels and wide entrance and exit doors.

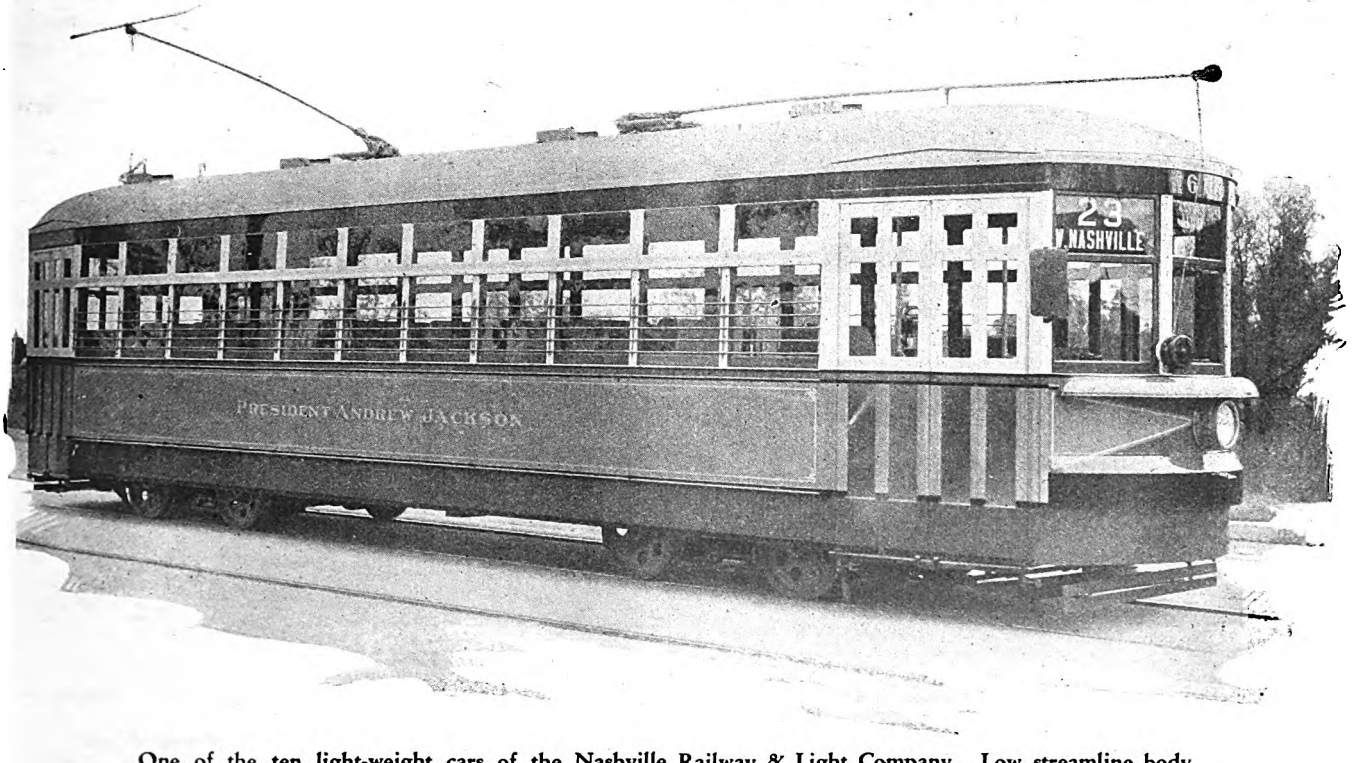
Elimination of trap doors in the floor assists in noise reduction. It necessitates all inspection and lubrication being done from beneath the car, and thus workmen with soiled clothing or hands do not enter the car and accidentally get oil or dirt on the seats. Roller bearings are used for armatures and wheels. An air-operated automotive type band brake eliminates the noise of rattling brake levers and shoes.



Interior of one of the Nashville cars. Symmetry, interior finish and excellence of illumination create an appeal to the rider

All electric switches are mounted on an accessible instrument board on the dash, together with the pneumatic door control, air brake and hand brake levers. The low dash affords the operator a clear view ahead and an outside mirror shows him the condition at the rear door. A windshield cleaner keeps the front window clear in rain or snow.

Semi-indirect lighting fixtures of box design provide evenly distributed illumination. Thermostatically controlled heaters are installed under the seats. No rods or cords are used for the operation of fare registers or signal bells. A pedal controls the two air-operated



One of the ten light-weight cars of the Nashville Railway & Light Company. Low streamline body, arch roof and broad skirt give a pleasing appearance

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registers, which indicate respectively cash and transfer passengers. Push buttons control the signal bells, while the warning gong is air operated. A red rear lamp is lighted automatically when the headlight is in use.

Route and destination signs mounted in the upper right-hand platform window show a large route number and the name of the destination point. The cowl at the top of the dash conceals the lamps which illuminate it, calling attention to the car at night.

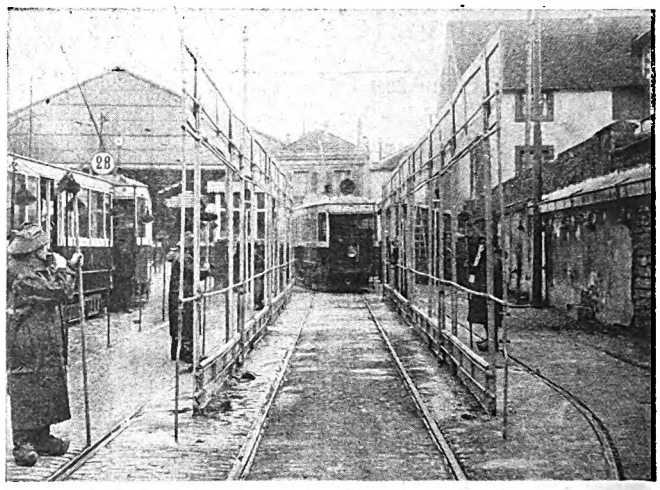
Each car has on its side the name of a Tennessee or Nashville pioneer. The men so honored are President Andrew Jackson, President James K. Polk, President Andrew Johnson, James Robertson, Sam Davis, John Servier, David Crockett, Samuel Houston, John Ball and William Carroll.

Paris Operators Wash Car in 2½ Minutes

Washing frames adapted for different types of cars and hollow brushes used for front and rear ends

CAR washing has been reduced to a science by the Paris Surface Lines, with resulting gain not only in time required for washing but also in labor. The latter is estimated at a saving of four men per day for each 100 cars, and as the company operates 3,000 cars, the introduction of these washing machines has saved about 1,200,000 francs ($48,000) per year. Since the first washing machine was installed practically every car depot has been equipped with them, and at one depot the machine is long enough to care for a motor car and trailer at the same time.

Briefly, the washing equipment consists of a framework of vertical water pipes with a number of horizontal perforated pipes set at different heights so that the spray from them will flush all the parts of the sides of a car where dust or mud might lodge. As the company has several different types of cars, there are various rows of horizontal pipes fed by different cocks. The cocks are numbered 1, 2 and 3, according to the type of car to be washed. The upper part of the framework on each side is surmounted by a board guard so that spray will not be thrown from one set of pipes over the roof upon workers on the other side of the car.



These Paris washing machines are located outside the carhouse or near the door when inside. As freezing weather is rarely reached in Paris during the winter, outside washing is practicable

To care for the front and rear end, which cannot be reached by the spray, special provision had to be made. This is in the form of scrubbing brushes with long hollow handles, the lower ends of which are connected by hose to the water system. By means of these brushes the ends of the cars can be washed quickly. While the water is being sprayed, different types of brushes are used by men to help remove the dirt, one form being employed on the windows, another on the sides of the car, etc. After the washing is completed squeegees in the hands of the men quickly remove the surplus water which remains on the sides of the car, particularly on the sash.

The time required for washing a car in this way is about 1½ minutes under the spray and 1 minute for drying. When the washing of one car is completed another takes its place. The washing places are illuminated at night by strong lights with reflectors.

A somewhat similar washing machine has been developed for washing the buses of the company.

When the water is turned on the men supplement the action of the water by brushes, which are of different shapes for the windows and panels. The ends are washed by brushes with long hollow handles. After the water is turned off the surplus water is removed by squeegees

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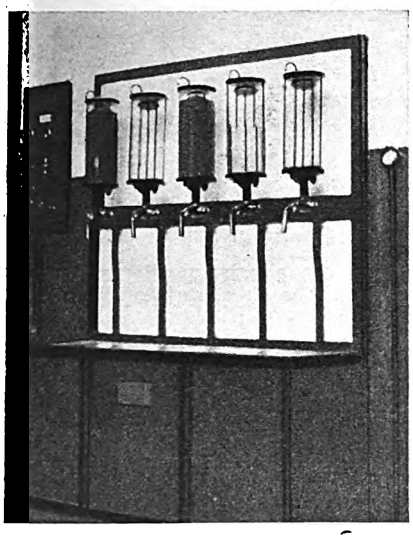
Maintenance Methods and Devices

Visible Measure for Oil Case

VARIOUS kinds of oil in continuous use in most repair shops are kept in a combination casing from which oil can be drawn as needed.



Oil tank for five different kinds of oil, fitted with means for measuring the oil removed

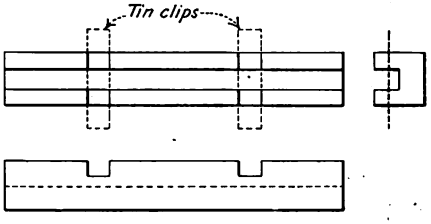
The Dortmund Street Railway, Dortmund, Germany, has a case of this kind, but with the added convenience of glass measure reservoirs, somewhat similar to those used by some gasoline filling stations in this country.

In the combination oil reservoir in Dortmund, illustrated herewith, any one of five different kinds of oil is pumped into its own graduated glass receptacle, so that the exact amount drawn off can be measured and recorded. Each of these measuring reservoirs holds 5 liters.

Device for Straightening Armature Coils

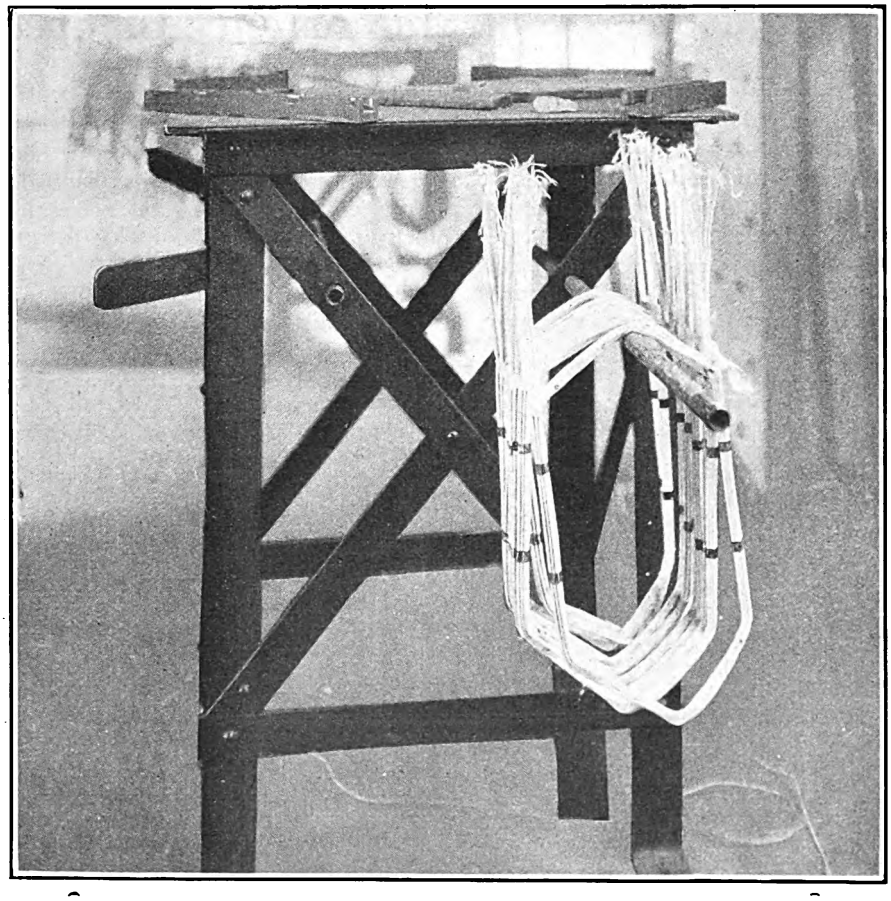
IN THE course of winding armature coils local kinks result which are not easily removed. If coils with the kinks are placed in a hot press the insulating armor which surrounds the wires becomes softened under the influence of the hot pressing and tends to push the local kinks into the soft insulation without straightening them. The result is that there is an appreciable increase in the dimensions of the coil or else the thickness of the insulation at the kink is reduced.

In order to overcome these conditions it is the practice of the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., to straighten the coil leads in clamps of a straightening table before the coils are hot pressed. The accompanying illustration shows the straightening table used. This is provided with four iron troughs, one at each corner of the machine. A detail of one of the iron troughs is shown in the accompanying line sketch. The troughs used on the straightening tables differ in size so as to accommodate different types of armature coils. The trough is machined to the thickness of the coil less the armor and is fastened securely to the table. Tin clips are laid into the cross grooves as indicated in the dotted line of the sketch. The coil is then inserted in the trough, one lead at a time, and is hammered home with a mallet and fiber. The ends of the tin clips are then turned over and mashed down with the mallet. These clips remain in position throughout the handling incident to the clipping and baking of the coils. They are removed only before the insulating armor is applied.



Details of iron trough used for Straightening armature coils

The straightening table has a metal top mounted on a steel frame-work so as to bring the top of the table about 3 ft. 6 in. above the floor. A steady rest is provided on the frame-work to support the lower edge of the coil while in the iron trough, so that the weight of the coil will not twist it out of shape. By locating the troughs at the corners of the table two men can work at the same table without interference.



Coil-straightening table as used in the department of electrical repairs of the Brooklyn-Manhattan Transit Corporation

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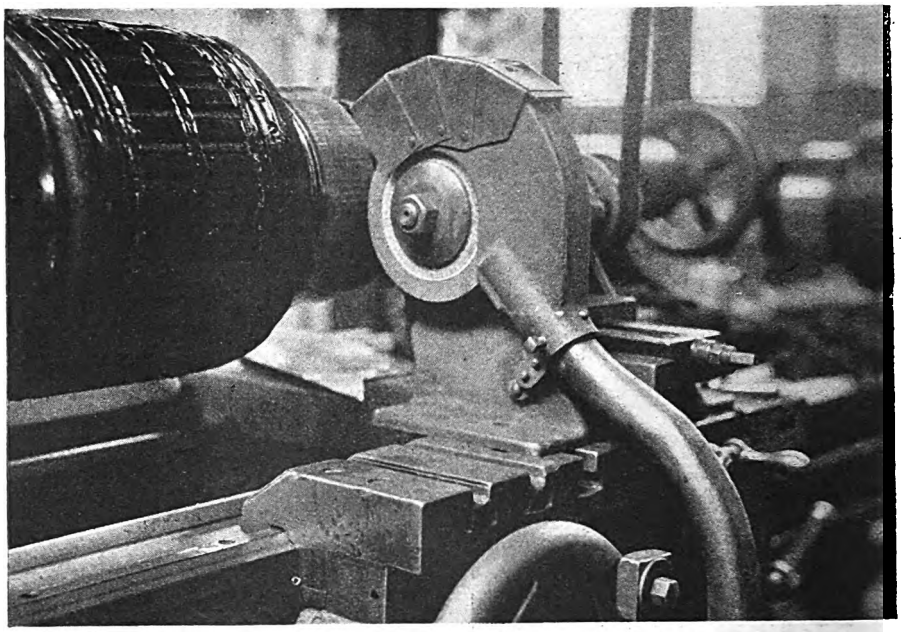
Commutators Refinished by Grinding

COMMUTATORS of railway motor armatures needing a small amount of refinishing to remove grooves and irregularities in the surface are made smooth by a grinding wheel mounted on a lathe in the shops of the Portland Electric Power Company, Portland, Ore. The company has found this method of removing slight irregularities in the commutator surface more economical and satisfactory than to take a cut with a tool. The grinding wheel is mounted on a bracket which is carried in the main tool carriage of the lathe. The cross-feed is coupled to the bracket so that the depth of grinding may be regulated. A metal guard collects the metal dust, abrasive material thrown off by the wheel and conveys it to a small pan suspended at the end of a connecting hose. The centrifugal action of the wheel is sufficient to blow this material down the tubing. The wheel used is a 10-in. x 1-in. Crystolon No. 3 grade with a rating of 60 grains. The drive to the wheel is from an overhead drum through belt to a small pulley. The wheel speed used for the grinding operation on commutators is approximately 3,400 r.p.m.



Grinding wheel mounted on lathe carriage used in the shops of the Portland Electric Power Company for finishing commutators. The 10-in. carborundum wheel is driven at approximately 3,400 r.p.m.

46 Contestants Submitted 106 Articles

in Maintenance Competition

THE closing date for articles submitted in ELECTRIC RAILWAY JOURNAL'S maintenance competition, which are to be judged for the three capital prizes, of $200, $100 and $50, has passed. There were 106 articles submitted by 46 different contestants. Articles are still being received for the monthly competition, as the monthly prizes of $25 will continue to be awarded each month up to May, 1928. Those who failed to get their material in for consideration by the judges awarding the three capital prizes still have a chance to win one of the monthly prizes by sending in the description of the device or method used.

It is planned to announce the winners of the three capital prizes in the Convention Number of ELECTRIC RAILWAY JOURNAL, which will be dated Sept. 17, 1927. The following is a list of contestants whose articles are being turned over to the judges for consideration in awarding the three capital prizes:

H. A. Albin, Lancaster, Ephrata & Lebanon Street Railway.
H. E. Bean, New York State Railways.
J. B. Blaiklock, Washington Railway & Electric Company.
Louis T. Botto, San Antonio Public Service Company.
L. A. Brammer, Jamaica Public Service Company.
H. L. Bullock, New York Central R.R.
R. T. Chiles, Cumberland County Power & Light Company.
Edwin R. Clarkson, United Electric Railways, Providence, R. I.
Arthur E. Clegg, San Diego Electric Railway.
C. H. Copley, Springfield Traction Co.
J. A. Duffy, Monongahela West Penn Public Service Company.
G. R. Fanning, Toronto Transportation Commission.
N. E. Ferguson, West Penn Railways.
P. A. Gilbert, Philadelphia Rapid Transit Company.
R. Harris, New Brunswick Power Co.
Charlie Herms, San Diego Electric Rwy.
William R. Hornberger, Philadelphia Rapid Transit Company.
Edwin C. Kelley, Virginia Public Service Company.
A. C. Lasher, Macon Railway & Light Co.
C. B. Lindsey, Los Angeles Railway.
I. O. Mall, New Orleans Public Service, Inc.
L. C. Mayer, York Railways.
W. H. McAloney, Georgia Power Co.
J. McDonald, Chattanooga Traction Co.
John McDowell, Toronto Transportation Commission.
Joseph Mercier, Montreal Tramways.
F. H. Midgley, Grand River Railway.
E. M. Miley, Chicago Surface Lines.
A. D. Moore, Philadelphia Rapid Transit Company.
Robert M. O'Brien, New Orleans Public Service, Inc.
A. T. Olsen, Omaha & Council Bluffs Street Railway.
Glen S. Reeves, Omaha & Council Bluffs Street Railway.
A. F. Rexfroth, Harrisburg Railways.
M. D. Schwegler, Toronto Transportation Commission.
Angus G. Scott, Cleveland Railway.
Thomas Standard, Omaha & Council Bluffs Street Railway.
L. Tait, London Street Railway.
A. Taurman, Birmingham Electric Company.
Farrell Tipton, San Diego Electric Railway.
William T. Trautman, United Railways & Electric Company, Baltimore.
Frank Volenec, Omaha & Council Bluffs Street Railway.
M. S. Walker, Beaver Valley Traction Company.
M. M. Watkins, New Orleans Public Service, Inc.
H. S. Williams, Department of Street Railways, Detroit.
C. W. Wood, Virginia Public Service Company.
F. C. Wornack, Virginia Electric & Power Company.

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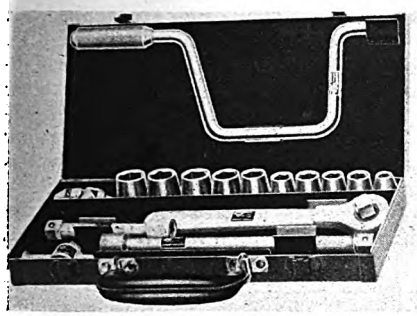
New Equipment Available

Socket-Wrench Set in Carrying Case

STILL another new chrome-vanadium socket-wrench set, put up in a substantial black enameled carrying case with a leather handle, is announced by the Bonney Forge &

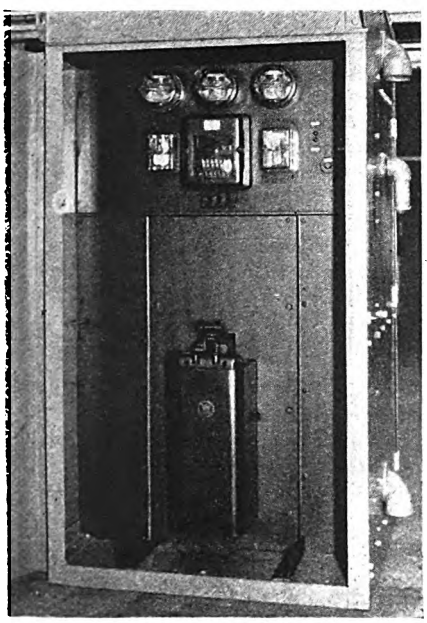


A conveniently arranged carrying case is provided for these socket wrenches

Tool Works, Allentown, Pa. This set includes ten chrome-vanadium hexagon sockets, from $\frac{7}{16}$ to $\frac{7}{8}$ in., inclusive, and the following chrome-vanadium handles: Ratchet, sliding "T," 13-in. brace, speeder type, 5-in. extension, 10-in. extension, and universal joint.

Economical Outdoor Switchhouse

SEVERAL desirable changes in the design of outdoor switchhouses have been made by the Westinghouse Electric & Manufacturing Company.



Front view of outdoor switches, showing steel switchboard and inclosed meters

One of the most prominent is the reduction in height which makes a single unit more compact and also allows ready mounting under existing structures and buses. Another feature is the complete isolation of the front from the rear of the houses without decreasing accessibility. This assures that a unit will have an entirely dead front, and will be neat in appearance and rigid in construction.

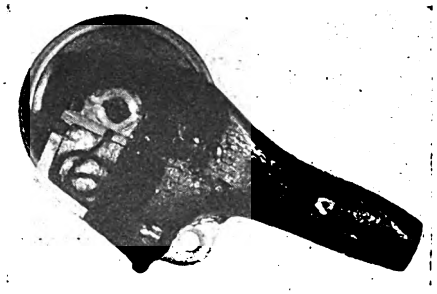
The meters and relays are now mounted on steel panels instead of slate. The steel provides additional bracing to the houses as well as eliminating the possibility of panel breakage. The circuit breaker control relay is mounted in a glass case, thus removing danger of contact with live parts in the front of the house. This enables power stations to utilize the services of a less inexperienced man to obtain meter readings without danger of physical injury from contact with live parts.

Trolley Harp with Wick Lubrication

USE of an oil reservoir in each cheek with a wick to carry the oil by capillary action to the wheel bushing is the feature of a trolley harp being marketed by the Neveroil Trolley Harp Company, Ltd., Lethbridge, Alberta. Harps are made of an aluminum alloy which is said to have a tensile strength of 35,000 lb. per square inch. The weight of the harp is slightly less than that of the average now in use.

The oil reservoirs have a capacity sufficient to lubricate the bushing for 10,000 miles of car travel. The manufacturer, however, recommends refilling every 5,000 car-miles as a precaution against lack of attention at the right time. The wick, which carries the oil from the oil chambers to the wheel bushings, terminates in the form of a cushion in a recess formed in the center of the axle. Wear of the wick is very slight as the film of oil evidently protects it, with the result that the wick does not deteriorate materially during the life of the wheel.

Results from test service lasting over four years indicate that the life of trolley wheels with this method of lubrication is increased approximately



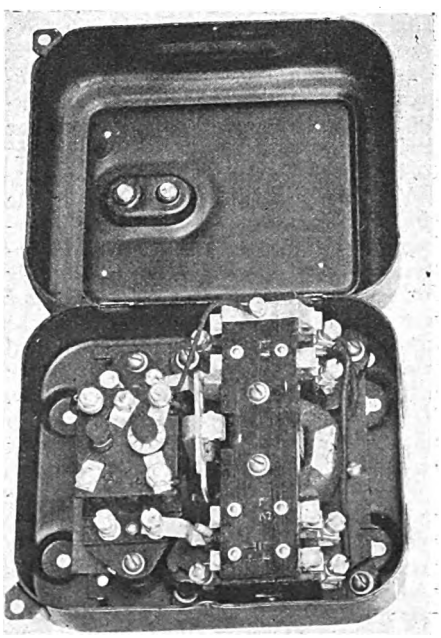
Trolley harp with portion cut away to show oil chamber and wick

25 per cent due to true running and less arcing and no replacement of bushings is required, as the original bushing outlasts the wheel.

Small-Sized Starter for A.C. Motors

FOR starting motors of 5 hp. and under the Cutler-Hammer Manufacturing Company, Chicago, Ill., has just brought out a small across-the-line starter. It gives push-button control for starting and stopping and provides thermal overload and no-voltage protection.

The push buttons are in the front cover of the case. The small size permits mounting in convenient locations and close to the motor so that extra wiring is saved. The contactor has a roller which is forced between two fingers to complete the circuit, making a double break wiping contact. To adapt the starter for the particular horsepower rating desired it is necessary only to insert the proper sized heater coils in the thermal overload relay.



Small across-the-line starter for 5-hp. a.c. motor

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Association Activities

Application of Production Methods to Repair Work*

By T. E. Alderdice
Superintendent of Shops Pittsburgh Railways

THE Pittsburgh Railways operates 115,590 car-miles per week day on approximately 600 miles of track (591 to be exact). Of this mileage, 25 per cent is one-man car operation. We have 1,433 cars assigned to service and operate 628 on week-day base schedule and 1,192 on peak schedule and about 250 work cars. There are twenty carhouses and one repair shop for maintenance of equipment, all under the superintendent of equipment.

Equipment maintenance work is done at the one central shop, known as the Homewood shop. Here there are five major departments namely, fabrication, method, assembly, overhaul, labor and material. The fabrication department includes the machine shop, millroom, blacksmith shop, sheet metal work, fare box repair and the electro-pneumatic work. The assembly department includes truck work, motor work, the stripping of equipment from cars and the assembly of the equipment that has been taken from the cars.

In the overhaul department cars and signs are painted, upholstering work is done, car bodies are stripped and overhauled and special way department equipment is overhauled. The labor and material department includes stores, reclamation, shop accounting, statistical, clerical, car dispatching and general labor, including janitors and watchmen. The method department, although having no direct operating responsibility, improves shop methods for greater efficiency, handles the scheduling and routing of work through the shop, and the design of tools, dies, jigs and fixtures to improve shop methods.

We do not tie up car bodies in the shop while the trucks are being overhauled. We maintain a pool of between 20 and 30 repaired trucks, ready for service. When a car is shopped for a motor or truck, the damaged trucks are removed, one of the spare repaired trucks is placed under the car and the car is immediately ready for service. We try not to keep a car in the shop any longer than 30 minutes for truck changes.

Truck overhaul work is done on a line production basis. The operations are as follows: Cutting apart of trucks by acetylene torches, dismounting of wheels and motors, delivery of new parts, bolts, lock washers, etc., by material handler, assembly of truck, mounting of wheels and motors, final assembly of truck, and final inspection by engineering inspector. By having a line method of work, the employees become specialists in particular operations and each crew of men must work as fast as the other crews along the line to prevent congestion at some point. The line also has the advantage that supervision becomes easier.

For motor repair work, the motor comes from the truck stripping position and is mounted on a small movable carriage which rolls on rails. We have seven positions on the motor repair track. Each man has certain operations to do. He has all the tools and repair parts necessary for his operations. The repair parts at his station are kept at a certain fixed quantity and are replenished from store stock every two hours, if necessary. We try to keep one day's material ahead of each man at all times. In this way we have eliminated lost time due to men hunting tools and materials. The first operation on the motor line is the removal of the armature, then the fields are tested. To this point there is a single track. If the fields are O.K. the motor frame is switched to a second track which parallels the first track. This second track joins with the first again at the seventh position where the repaired armatures are applied. If motor is defective, it goes through on the regular work track. In the near future, we intend to move the armature winding department so that it will parallel the motor line. After the motor has been tested it is mounted on wheels and axle and fed into the truck line.

The stores at Homewood are under shop supervision, although the materials in stores are chargeable to material and supplies accounts until withdrawn for service. The fact that the storeroom is included in the shop organization places the responsibility for both labor and material entirely up to the shop organization, thus preventing "passing the buck" about not having material on hand when it is needed.

The storeroom is subdivided into sections based upon the operating accounts to which the material is charged when withdrawn. On the end of each case of storage bins there is placed a blueprint giving the following information: operating account number with items arranged alphabetically, class number and bin number. This plan greatly expedites the filling of requisitions.

We have one stock clerk in charge of each section. His duty is to keep properly stored all materials belonging to his section and to fill all requisitions which are sent to his section. To facilitate this, we insist that a separate requisition be made by the shops and carhouses for each account to which material is to be charged.

There is a regular schedule of two deliveries per week by motor truck from the main storehouse to the carhouses. The schedule to the shop calls for four deliveries per day by means of a tractor truck with trailers. We have two trains of these trailers. While one train is being delivered and unloaded in the shop the other train is being unloaded and loaded in the storeroom.

These trailers are marked with the different departments to which they are to be delivered. The trailer which belongs to the department nearest the storeroom is placed at the rear end of the train. When the driver reaches this point the material handler in the department unhooks and proceeds to unload the trailer. This trailer is then loaded with any repaired or excess material in the department, which is returnable to stores. In the meantime the driver has proceeded to the next department, where the same routine is followed. When the tractor driver

*Abstract of paper presented at semi-annual meeting, Electric Railway Association of Equipment Men, Southern Properties, Atlanta, Ga., July 27-29.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Aug. 18-19*—Wisconsin Utilities Association, Transportation Section, annual convention, Hotel Pfister, Milwaukee, Wis.**

***Sept. 1-3*—National Electrical Manufacturers Association, Policies Division, meeting, Association Island, N. Y.**

***Sept. 1-4*—Tenth Annual Conference on Human Relations in Industry, Silver Bay on Lake George, N. Y.**

***Sept. 7-9*—American Society of Mechanical Engineers, Machine Shop Practice Division, first national meeting, Mason Laboratory, Yale University, New Haven, Conn.**

***Sept. 8*—Central Electric Railway Master Mechanics Association, Hotel La Salle, South Bend, Ind.**

***Sept. 13-15*—International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting. Book-Cadillac Hotel, Detroit, Mich.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit. Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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reaches the end of his run he is held up a few minutes while he and the material handler unloads and loads the last trailer. He then retraces his course to the stores department, picking up the loaded trailers and the requisitions which have been issued. These requisitions will be filled and ready for delivery on his second trip. Clerks, foremen or men are not permitted to go to the storeroom for material.

In addition to tractor deliveries from stores to the shop, we have inside the shop a tractor equipped with trailers which is manned by a driver and helper. This tractor is stationed in the reclamation department. When it is desired to move material to be repaired inside the shop the department which wishes this material moved telephones to the reclamation department.

In order that the heads of the various departments may be informed as to the cost of material used, all disbursements of the stores department are totaled daily by accounts and subdivided into disbursements to shops and carhouses. This figure is available at noon the day following. All credits on material returned to stores are handled similarly, so that by deducting these credits from the disbursements the net material cost per day is known.

Reclamation Division Plays Important Rôle

There is a division of the labor and material department known as the reclamation division, which functions in the capacity of a key position in the return of material to the stores department. All used material is removed from the carhouses and sent to the reclamation department by truck. Carhouse men are not permitted to scrap any material. When it is received at the reclamation division it is inspected by an engineer, who decides whether it is to be scrapped or repaired. His decision is based upon the material cost record to date. If the net material costs are running high he tightens up on the scrapping of material. In this way a control of the material costs is obtained by controlling the scrap pile at one central point.

After the material that is to be repaired is segregated from the scrap it is again segregated by items. It is then held until a sufficient number of pieces has been received, ready for repairs. This pool is decided on the basis of the quantity that is the most economical to be put through the shop. After the pool point has been reached a shop order is issued on the fabrication department for the repair work. This order accompanies the material into the fabrication department. The time of each employee and the material used are entered on the back of the shop order and from this information the cost of doing the work is calculated.

When the repaired material has been received the reclamation foreman makes out a returned materials report and sends the material to the storeroom. When this material is received into stock the materials and supplies accounts are charged with its value and the proper operating account is credited. The value of the material is based upon the cost of new material.

The method department is headed by a practical production man who has a tool maker, time estimator and job schedule man reporting to him. The tool maker, under the direction of the supervisor of methods, makes jigs, dies and fixtures for increasing the shop production. The time estimator sets standard times for all operations in the shop and checks the actual performance of the work, to see that it is within the standard time set-up. The job schedule man routes all work through the shop and sees that the routing is lived up to and the work completed within the schedule and kept moving through the shop.

The aim of our entire organization is to obtain better results at minimum cost and effort. We have only 342 men on shop work, or approximately one man for every five cars operated. We believe we have merely scratched the surface of the possibilities in the improvement of our shop organization and practice and so we are continuing to plug away for better results.

Lacquer Finishes for Street Cars*

By D. H. Boll

Supervisor of Overhaul Pittsburgh Railways

Lacquer is a solution of nitrocellulose with pigment and a few other ingredients in a highly volatile liquid which evaporates very rapidly, after application, leaving a tough, strong, protective film. Various industries have been using a protective coating known as lacquer commercially for many years. This material has been found useful on lighting fixtures, metal spinning and stamping work, hardware, silverware and other similar articles. Those lacquers, however, are of a slower drying nature and are not really comparable with the material now being commonly used and known as lacquer. However, the successful introduction of pigments into those lacquers finally led to the present product.

Five principal materials find their way into the making of lacquer. These are nitrocellulose, gums, softeners, pigment and volatile solvents. Each of these materials plays its own necessary part in making the use of lacquer practical. Nitrocellulose, also commonly called nitro-cotton and pyroxylin, furnishes the body of the film and makes up the greater part of the material deposited on a surface. The gums used are to increase the adhesion of the lacquer and to add luster to the film when dried. The softeners, which remain in the film after it has dried, increase the elasticity of the dried film and prevent it from becoming too hard and brittle. Pigments with a good hiding power must be used because so much less pigment material can be carried in lacquer than in paints and varnishes. The pigments really act as a sun shade to the film. Clear lacquer will decompose at about the same rate as clear varnish when exposed to the sunlight, but when pigments are added the decomposition is very slow, much slower, in fact, than with a pigmented paint or varnish. Then, finally, there are the volatile solvents. Several of these can be used. They all evaporate very quickly, leaving a hard, dry film. This is the most important difference between lacquer and paints or varnishes. A lacquer film is dry to the touch in less than fifteen minutes, depending, of course, on the humidity of the air in the shop.

The protective film left on the surface by lacquer, after it has dried, is very tough and hard, but retains a certain amount of elasticity. The gums decompose very slowly. The film is practically chemically inert and no chemical changes take place within the film during its life. Dry cleaning improves the luster of lacquer. It can be cleaned easily because the surface is more impervious to dirt than is paint or varnish.

In Pittsburgh we find a difference in time and an improvement of appearance resulting from lacquer on cars. The dirt we experience there is of a very sticky type, characteristic of a large industrial city. It cleans from a lacquer film much more readily than from any other protective paint material. Furthermore, acid can be used for cleaning lacquer without any harmful effects, and our experience has proved to us that other surfaces cannot be cleaned often by acid without ill effects, particularly, enamel surfaces.

Ease of Application an Advantage

Lacquer can be easily sprayed. It is very essential that the surface to be covered be clean and absolutely free from grease, dirt, water, scale or any other foreign substances. We believe the best method of cleaning steel for the application of lacquer is by means of a sand blast.

We are at present applying lacquer finishes to our steel cars as they go through the shop. The first car we lacquered was finished Aug. 3, 1924, almost three years ago. This car is still in service with the original job and is in very good condition. Following that, a number of lacquer manufacturers were given one or more cars on which to apply their complete system, and the results have been very carefully watched. Beginning in August, 1926, just a year ago, we began to finish all

*Abstract of paper presented at semi-annual meeting, Electric Railway Association of Equipment Men, Southern Properties, Atlanta, Ga., July 27-29.

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steel cars going through the shop in lacquer, on a production basis.

We do not use lacquer over wooden surfaces. The greater part of our equipment is steel. We have experimented considerably with lacquer for wood, but have not as yet convinced ourselves that we should standardize on its use for wooden surfaces. Our experience leads us to attribute the difficulty to the nonporous nature of the lacquer film and the presence of moisture in the wood. There seems to be no reason why a practical lacquer will not some day be developed to overcome this difficulty, if such a lacquer has not already been developed.

Have Used Lacquer Over Old Varnish

On some cars we have applied a lacquer finish over the old varnished surface. This system gave fairly good results, but it cannot be expected to give the results that are obtained when the old paint is removed. The schedule we followed for this work was as follows: first day, wash and scrub the car thoroughly inside and out; second day, clean and prime scratches, rust spots and dents. At this point we cover the windows and doors with shields and mask the headlight sign and stop-light glasses. Third, putty all uneven surfaces, not trying to putty out any scratches or dents that are very deep; fourth day, scuff sand and apply one coat of a special surface or intermediate coat; fifth day, scuff sand and apply three coats of lacquer; stripe and edge bumpers, roofs, steps and other parts that are trimmed. Spray equipment is used for all work in our shops wherever possible. We prefer the forced feed type of this equipment to the suction feed. We make our own masking materials from whiting and soap. These are used half and half, with enough water to make a consistency that permits application with a brush to the surface to be cleaned.

With the advent of lacquer we do all the painting work in six days, including roof, floor, ceilings, interior wood and steel finish and stanchions. The schedule is arranged as follows: First day, clean off old material with the Moore chemical process or varnish remover. Apply shields over sash and doors if they are not removed and in the openings if they have been removed. Mask the headlights and stop lights. Second day, blow out all joints where remover may be lodged with an air hose. Clean off rust spots with a wire brush emery cloth and lacquer thinner. Wipe the entire surface off thinner so as to remove any grease that may be present. Then spray a coat of 24-hour oil primer. Third day, putty all uneven surfaces early in the morning and spray a coat of surface paint in the afternoon; fourth day, spray a coat of oil surfaces; fifth day, spray three coats of lacquer; sixth day, stripe and number with lacquer and edge in buffers, couplers, roofs steps, window guards, etc.

We find the first costs of the lacquer and varnish systems are about the same, due to the difference in the costs of the materials. A large saving is made with lacquer, however, because of its durability and the ease with which it may be cut in when the surface is damaged. We have experienced very little trouble with lacquered cars changing color, and when a car is damaged so that new material is necessary on the exterior, the cutting in system is very simple and effective. Our present procedure with work of this nature is to apply a coat of quick-drying lacquer primer, usually late in the day. The next morning we use a quick-drying lacquer putty if necessary and in a couple of hours spray one or two coats of a quick-drying lacquer surfacer, and we are usually able to get the color and striping on the same day. We are obtaining very good results with this quick system, and it is being watched very closely, since it indicates the possibilities of applying an entire lacquer system in two or three days.

Elimination of spray dust is one of the problems encountered in the use of lacquers. We are installing a ventilating system to exhaust these fumes. They are considered not injurious to the health of employees but they do create a fire hazard unless the shop is large and well ventilated.

Railways Urged to Enter Safety Competition

WHEN the Anthony N. Brady safety award was revived this year, after having been dormant since 1916, the American Electric Railway executive committee felt that additional stimulus would be given to the laudable effort being carried on by electric railways to safeguard human life. It felt also that this competition would give additional opportunity for calling attention to the street car as "the safest place on the street."

Prior to Aug. 1, the original closing date for this year's contest, only two electric railways filed briefs with the American Museum of Safety. In the hope that other properties will enter the contest, the time limit for filing briefs has been extended to Sept. 1.

Conditions of the contest are such that the preparation of briefs is made as simple and easy as possible. Now that the time limit is extended, it is earnestly to be hoped that many other companies will avail themselves of this opportunity of recording their safety achievements and help to direct public attention to the safety of the street car. The importance of the subject justifies wider interest in this contest on the part of electric railway executives than is indicated by the number of entries that have been made.

LUCIUS S. STORRS.

International Association Will Meet In Rome Next Year

ROME has been selected as the place of the convention in 1928 of the Union Internationale de Tramways, de Chemins de fer d'Intéret Local et de Transports Publics Automobiles. An official invitation to meet in Rome was received from the Italian Government. The date of the convention has been set for May 6-12, 1928. This is considerably earlier than the association has been accustomed to meet, but the time was set presumably because the weather in Rome in May is delightful.

A list of the subjects to be covered follows:

"One-man Cars," by M. Bacqueyrisse, general manager of operation and engineering, Paris tramway and bus system.

"Recent Improvements in Brakes for Electric Railway Cars," by M. Vente, chief engineer Marseilles Tramways; M. Allard, consulting engineer, National Interurban Railway System of Belgium, Brussels, and M. Cuccoli, engineer Milan Municipal Tramways.

"Gasoline Motor Cars," by M. Mellini, Department of Public Works, Rome, and M. La Valle, general supervisor of the Department of Railways, Tramways and Automobiles, Rome.

"Recent Improvements in Track Construction," by M. Van Noorbeeck, inspector general, National Railway System of Belgium, Brussels, and M. Jeancard, general manager, Light Railway Company of Charentes, Paris.

"Relation Between Axles and Car Body: Fixed and Radial Axles," by M. Castaing, chief engineer of traction and supplies, Paris railway and bus system, and M. Harmel, manager East-West Railway of Liége, Belgium.

"The Motive System for Automobile Transportation," by M. Guiffart, manager French General Tramways Company, Paris.

"Methods and Equipment for Improving the Regularity of Tramway Service," by M. de Barquin, consulting engineer, Brussels Tramways.

"Tramway Operation on Right-of-Way or Reservations in City Environs," by M. Lenartowicz, assistant manager Warsaw Tramways.

Communication on "Standardization of Street Railway Motors," by M. Peridier, manager of technical research, Paris tramway and bus system.

Communication on "Rail Corrugation," by M. Thonet, manager and vice-president, Société Anonyme d'Entreprise Générale de Travaux, Brussels, and M. Bacqueyrisse, general manager of operation and engineering, Paris tramway and bus system.

Pick-Up-and-Delivery Service to Be Discussed

AN ACCORDANCE with the action taken at the meeting of the Central Electric Traffic Association held in Fort Wayne, Ind., on July 19, 1927, there will be a special meeting of the association at Hotel Keenan, Fort Wayne, Aug. 16, 1927, commencing at 8 a.m., Central Standard time, for the purpose of further discussing pick-up-and-delivery service and trap car service by truck. The discussion at the meeting on July 19 developed that member lines should

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make a canvass of the territory which they serve in the endeavor to ascertain approximately the amount of additional tonnage and revenue they might receive by rendering truck service, the approximate additional cost of performing such service, determine the points at which such service will be rendered and draft such rules and conditions under which the service will be performed. If the above information is covered fully by each member attending this meeting it will be possible to submit a plan for performing the service.

American Association News

Unusual Program Planned for Cleveland

Luncheon conferences on Tuesday, Wednesday and Thursday to cover wide range of operating problems—Speakers of national prominence to address formal meetings

A PROGRAM combining in an unusual way two general classes of meetings is planned for the American Association sessions at this year's annual convention. There is to be ample opportunity for the exchange of practical operating experience among electric railway executives and also a program of prominent and inspiring speakers from outside the industry who have a real message of direct interest.

This is to be accomplished through a series of round-table luncheon conferences to supplement the formal program of speakers. These will be held on Tuesday, Oct. 4; Wednesday, Oct. 5, and Thursday, Oct. 6. Six simultaneous luncheons will be held on Wednesday and seven on Thursday, each devoted to a subject of special interest to railway executives. The thought in mind is that delegates will attend the meeting in which they are most interested.

Tentative plans for these conferences include the following general subjects:

Tuesday, Oct. 4

1. Traffic regulation.
2. Taxes.
3. The motor bus.
4. The trend in franchises.
5. The valuation question.
6. Advertising—to increase riding; to improve public relations.

Wednesday, Oct. 5

7. Cars—What's being done and results.
8. The problem of financing.
9. Public relations.
10. Bringing city service up-to-date.
11. Developing sales instinct in platform employees.
12. Trend of fares.
13. Employee relations.

Thursday, Oct. 6

14. Opportunities and prospects for the interurban.

To Afford Opportunity for Discussion Among Executives

In announcing this innovation it was the thought of the program committee that many railway executives come to the convention with some particular problem in mind on which they desire help. It is impossible to frame a formal program to meet all the varying problems that would thus be developed. It was thought that this luncheon conference plan would provide a medium whereby every railway man would be able to get help on the problems he had uppermost in his mind. Those who were seeking help on a given subject and those who had recently made some accomplishment along the lines of the subject under discussion would naturally choose the same luncheon, and this would provide the ideal condition for exchange of information.

It is the committee's intention that these luncheon meetings will be conducted on the most informal basis possible. No one will rise to talk. It will be a cross-table exchange of experiences and questions. The sponsor will merely serve to get the discussion started and perhaps guide it somewhat. The luncheons will start at 1 p.m. and will last until 2:30 p.m. In the afternoon the affiliated associations' sessions are not to be called to order until 3 p.m.

Luncheon Tickets to be Sold in Advance

The luncheon meetings will be well advertised in advance and delegates will be urged to make reservations early in order to avoid disappointment in attending a meeting in which they are particularly interested. Tickets will be sold in advance. To insure informality during the luncheon conferences, each will be limited to an attendance of 50. It is the committee's thought that the entire success of these conferences will depend upon early reservations being made by those who wish to take part in the discussion of a particular subject.

The tentative program for the three main morning sessions of the convention includes a list of prominent speakers of national reputation who can bring to the electric railway industry a broad viewpoint and an inspiring message. In arranging this main program the committee has taken special pains that no talk longer than 30 minutes and that two-hour sessions instead of three-hour sessions will be the rule. Routine business, however, will be held to a minimum. The committee is arranging for copies of the program to be sent in liberal number to every member company, and to individual members as far in advance as it is available. It also plans to have loud speakers in the main meeting room and to make every possible provision for insuring that noise and distraction in the meeting room will be reduced to a minimum.

Special Bulletins

FOLLOWING is a list of special reports being prepared by the Bureau of Information and Service of the American Electric Railway Association. They will be available for member companies upon request:

Bulletin No. 153.—Motor Bus Operating Reports.—This contains copies of the annual reports of a number of independent motor bus companies and summaries of the reports of large groups of companies to the state public service commissions, together with miscellaneous data on motor bus operations compiled from various sources.

Bulletin No. 154.—Electric Railway Timekeeping Systems.—Describes in some detail the methods adopted by a number of electric railways for keeping the time of their employees, and their methods of preparing their payrolls. Copies of the various forms used are also given with some description of their use.

Bulletin No. 155.—List of Common Carrier Motor Vehicle Operators, Eight States.—Contains a complete list of individuals and corporations receiving certificates of convenience and necessity from the public service commissions in eight states, showing the name of the company or individual, the address, and, where this information is required by the commission, the number of miles of route and the number of vehicles operated.

Bulletin No. 156.—Comparison of Electric Railway Operating Conditions, Operating Expenses and Results of Operation on Various Unit Bases, Part III, Combination City and Interurban Lines.—A tabulation of ratios and unit figures derived from the operating reports of combination city and interurban companies, for the calendar year 1926. Included in the data tabulated are average speed, number of passengers per mile of track, per car mile and per car operated, operating ratio, gross and net revenue per mile of track, cost of maintaining plant and equipment per car mile and per unit of property maintained, and operating costs on various unit bases of comparison.

In addition to the above the following supplements have been prepared, bringing the information they cover down to date:

Supplement No. 23 to City and Interurban Fare Bulletins Nos. 41 and 42.

Supplement No. 5 to Bulletin No. 129: Wages of Trainmen.

Supplement No. 5 to Bulletin No. 130: Wages of Bus men.

Cost of Living Studies (Bulletin No. 157.)

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News of the Industry

Reasons for Seeking Increase in Baltimore Explained

In an effort to increase public understanding of the application filed with the Maryland Public Service Commission by the United Railway & Electric Company, Baltimore, asking an increase in fare from 7½ to 10 cents and immediate relief measures, the company has published advertisements in the newspapers setting forth the situation frankly and has sent a number of these statements through the mails. The company also issued a pamphlet answering twenty questions most likely to be asked by the public in connection with the application for an increased rate. As a further means of keeping the public advised the company has announced that C. D. Emmons, the president, will be glad to answer any questions.

The United's effort to get an immediate hearing for an emergency rate was met by a statement from the Public Service Commission that it would have to dispose of two other cases with emergency features before the railway case could be considered. The hearing is expected to take place, however, within the next few weeks.

Following action by Mayor William F. Broening, Charles C. Wallace, City Solicitor, will join with Thomas J. Tingley people's counsel, opposing the fare increase.

A statement made by Mr. Emmons said that with a 10-cent fare the company would make numerous improvements, increase the wages of the carmen from 53 to 55 cents an hour, increase the miles of track rebuilt yearly from 16½ to 20, purchase 75 new articulated cars at a cost of $27,000 each and add other new cars as required and increase the amount set aside for depreciation. He also said that increased revenue would increase the amount of park tax paid.

Long Beach Franchise Requests Refused

Requests of the Lang Transportation Company and the Pacific Electric Railway for franchises to operate carrier systems in Long Beach, Cal., were refused by the City Council recently. The action came when H. S. Callahan, City Manager, advised the body that in his opinion the "universal transfer" clause in the city charter prevented any one but the Pacific Electric from receiving a franchise.

This clause has been the chief stumbling block in solving the city's transportation problem. Its legality is being tested. Should the clause be found constitutional, the city may be forced to establish municipal lines.

The citizens' transportation committee advocated municipal ownership as a means of solving the problem and urged the Council to purchase 45 buses. These would be used for lines paralleling or replacing those now operated by the B. & H. Transportation Company. This company is operating lines under revocable permits. It has made the city an offer to sell out for $480,000, but city officials declined the proposition.

The decision that the franchise offers of the Lang Company and the Pacific Electric Railway were not satisfactory, the refusal of all offers of the B. & H. Company and the questioned legal status of the universal transfer clause have all tended to complicate a situation which city officials insist must be settled at an early date.

Paint Job Pleases Oklahoma City Patrons

The joint receivers of the Oklahoma Railway, Oklahoma City, Okla., are receiving many favorable letters and comments upon the new paint on city and interurban cars. The old standard orange color is being replaced by bright and attractive color combinations. The interiors of the cars are also being repainted and redecorated, giving a general appearance of beauty and cleanliness. Those who have commented on the situation say that the new color schemes constitute an improvement in the general scenery of Oklahoma City, and that the redecorated cars will make a favorable impression not only upon home folks but upon visitors as well.

Zone Limits Readjusted

New Jersey board hands down order modifying limits on trolley and bus lines—Discussion involved issue of its right to co-ordinate bus and railway fares

A GENERAL adjustment of bus and electric railway fare zones affecting Newark, N. J., and surrounding municipalities and effective on Aug. 14, is made in a decision filed on Aug. 5 by the Public Utilities Commission on the application of the Public Service Transportation Company and the Public Service Railway. The decision, in effect may cut about in half the increased gross revenue of around $650,000 annually which, it was estimated, would have resulted had the application of the Public Service been granted in full. The outstanding change provided affects Irvington. The details of the changes are of much local interest, but the recital of them in toto here would not be helpful except to persons familiar with the topography of the territory affected.

The board, in an opinion appended to the decision and order, goes into a brief history of the transportation situation, particularly rates, and discusses the involved issue raised at the bus hearings as to whether it can, under the law, co-ordinate bus and trolley fares. The opinion reads:

> It is apparent that the consequent increase in fares is an element that must be considered. If the transportation company is earning sufficient revenue to provide an adequate rate of return, the revenue beyond a fair return will not be lawful, even though its object would be to equalize the railway and bus operation.

The commission adds that the Legislature, in passing the law providing that electric railways may operate buses, clearly intended that each operation, at least as to rates of fare, should be considered separately and distinctly "and the profits of one should not be used to make up the deficits of the other." The commission says:

> While this is not the situation before use, the board nevertheless interprets this statute to indicate the policy of the state to the extent that the operations and earnings of the two forms of transportation should stand on their own basis and not be affected by the conditions of the other.
>
> The board can, therefore, only determine the matter of the equalization of the operations of the Public Service Railway and Public Service Transportation Company if it appears that neither company is at the present time earning a return that is adequate or a rate of return that would be excessive, with such increased revenue as may accrue from the modification or adjustment of the zones.

The board then considers the financial situation of each company, setting forth that the commission, in 1921 found a valuation of $82,000,000 for the railway and that the master appointed by the Federal Court found a value upward of $100,000,000. The proofs in the present case indicate, the commission declares, that the railway is not earning an adequate return on the value of its property. Moreover, it sets forth that, even were all of the anticipated increased revenue from the adjustment of fare zones to go to the railway, it still would not be getting more than an adequate return upon the value of its investment.

In the case of the Public Service Transportation Company, the commission accepts in its decision neither the valuation claimed by the company of upward of $18,229,197, nor the valuation of John Bauer, expert for the municipalities, of approximately $11,600,000. It is inclined to the belief that the valuation is between those figures.

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It points out, moreover, that, beginning the first of this year, the transportation company's operating expenses will be increased about $435,000 annually by reason of allocating to it part of the administration expenses of the operating of the transportation system as a whole, heretofore carried entirely by the railway. The commission infers that that allocation is a reasonable one in view of the fact that the general administrative officers work for the bus as well as the railway.

Its conclusion, in general, is that the bus company, even were it to get all the increased revenue anticipated under the adjustment of fare zones, would not be earning too much on the value of its investment, although it points out that the case is not a valuation rate case, as such. The opinion states:

The board is not required, in passing upon increased rates, to determine the value of the property of a company and its consequent rate of return.

It appearing that the anticipated increased revenue to the companies will not produce a rate of return that will be excessive, it becomes neccessary, therefore, to determine from the standpoint of public convenience and necessity whether the adjustment of zones as proposed by the company is suitable and proper or whether some other modification thereof would be more in the public interest.

It then goes into a discussion of the various problems involved in the proposed adjustments and sets forth what it considers should be done in each instance.

State Adds 2 Cents Per Gallon to Illinois Gas Bills

Illinois' new gasoline tax, which adds 2 cents to the price of every gallon used for motor car operation within the state, went into effect on Aug. 1. Although stoutly opposed by the Chicago Motor Club and other influential organizations, the bill which proposed the tax was finally passed by the Legislature on June 29. Claiming that the law is discriminatory and unconstitutional, the Chicago Motor Club straightway set about to restrain the collection of the tax by asking an injunction against the state to stop the expenditure of $50,000 set aside for the law's enforcement. The courts gave Attorney-General Carlestrom until Aug. 6 to file an answer to these charges.

The new law required that all dealers report their supply of gas on hand on Aug. 1 to state officers and on the twentieth day of each succeeding month pay a 2 cent tax per gallon on what has been sold or used. The incidence of the tax is, of course, shifted to the motorist, although he pays no direct tax. It is thought that the oil companies themselves will absorb bookkeeping costs and other charges.

Half of the $50,000,000 a year which is expected to be obtained by the tax will be employed in extending the state's hard road system in the counties in which the tax is collected and the other half will go to the State Treasury.

City Must Explain Abandonment of Staten Island Operation

Federal Judge Campbell in Brooklyn has signed an order directing Mayor Walker and Albert Goldman, Commissioner of Plant and Structures of the City of New York, to show cause why the city should not be compelled to resume operation of the Staten Island-Midland Railway. The order was obtained by the Westinghouse company and Mortimer Brenner, receiver for the railway. The company went into the hands of receivers in 1920 and later the city took over the operation of the lines, which serve Staten Island. Following refusal of the city to pay a $175,000 bill of the Staten Island Edison Company for power, current was shut off. The city then arranged for a substitute service by buses.

Management Discusses Affairs of St. Petersburg Municipal Railway

St. Petersburg's municipal railway is again the subject of discussion among those responsible for its conduct. Statements about the Florida property have recently been made by Mayor C. J. Maurer, the three city commissioners and R. E. Ludwig, director of public utilities in immediate charge of the operation of the railway. Mayor Maurer and Commissioners Arnold, Purvis and Veillard all favor a universal transfer. Mr. Veillard, however, tempered his statement by expressing the belief that the system could not be put into effect until the railway was in better financial condition. Mr. Arnold believes that coordination should be increased between the street cars and the bus line by using the bus line largely as feeders and issuing transfers from the bus to the street car. As he sees it, this would eliminate the long bus route and make it possible to use the buses to connect the terminal points of the railway. Mr. Purvis favors a universal transfer, but is opposed to the reduction in fare. Mr. Veillard thought the transfer system would decrease the general revenue of the railway. The Mayor said he would favor a return to the 5-cent fare rather than establish a transfer system.

Commissioner Ludwig is opposed to the proposed transfer system. He pointed out that the past year had seen a loss in the operation of the railway, even with the increase to the 7-cent fare. At the time the city increased the fare to 7 cents, it reduced the rate to points beyond Disston Avenue. In the past the fare was 10 cents to any point beyond Disston Avenue. Today it is 7 cents. Even at that, traffic has shown no increase as a result of this reduction. The director contended that the railway would show a better financial statement had it not been called upon to reconstruct the tracks to improve the boulevard, making the automobile a still more serious competitor of the railway. Mr. Ludwig suggested that newspaper space be used during the winter to acquaint the public with the many interesting places in and near the city and that the cars and buses operating to the resorts be properly placarded.

Quoth the merchant when he heard
That three of every four
Of his shoppers came by troiley,
"Park your autos nevermore.
For your parking slows up business
That is headed toward my store;
Keep your cars at home for pleasure;
Use the street cars evermore."

—*The Pretzel.*

Memorial for Early Indiana Financier

Crawfordsville, Ind., is planning to erect a memorial to Noah J. Clodfelter, one of the first financiers of electric railways in Indiana. Mr. Clodfelter's story is similar to that of so many other dreamers—he made millions for others but died in obscurity in 1901. His first work was in Grant County, where he started the electric railway from Marion to Indianapolis. Friends of Mr. Clodfelter are behind a project to erect a memorial to him. It has been suggested that a fitting epitaph would be his own statement: "I hold there is but small space between heaven and the true poet."

Pennsylvania Railroad Arranges for More Power

Under the terms of the contract announced on July 25, the Pennsylvania Railroad will buy all of its energy for use in the Philadelphia territory from the Philadelphia Electric Company for a minimum period of twenty years. At present the railroad's main line between Philadelphia and the West is electrified as far as Paoli, as is its Chestnut Hill branch.

The railroad also is the principal owner of the West Jersey & Seashore Railroad, which operates an electric system between Camden and Atlantic City. The Philadelphia Electric Company is at present supplying all the electric requirements of the Pennsylvania Railroad, both in and around Philadelphia and in New Jersey.

Work of electrifying the Pennsylvania Railroad's southward line as far as Wilmington is well under way, and announcement of the completion of the Philadelphia and West Chester division's electrification is looked for in the near future.

A large portion of the energy that will be consumed by the Pennsylvania Railroad and other large wholesale buyers of electricity from the Philadelphia Electric Company will be supplied by the hydro-electric plant at Conowingo, which is expected to be in operation late in 1928. Among the other large wholesale customers of the Philadelphia Electric Company are the Philadelphia Rapid Transit System and the Public Service Corporation of New Jersey.

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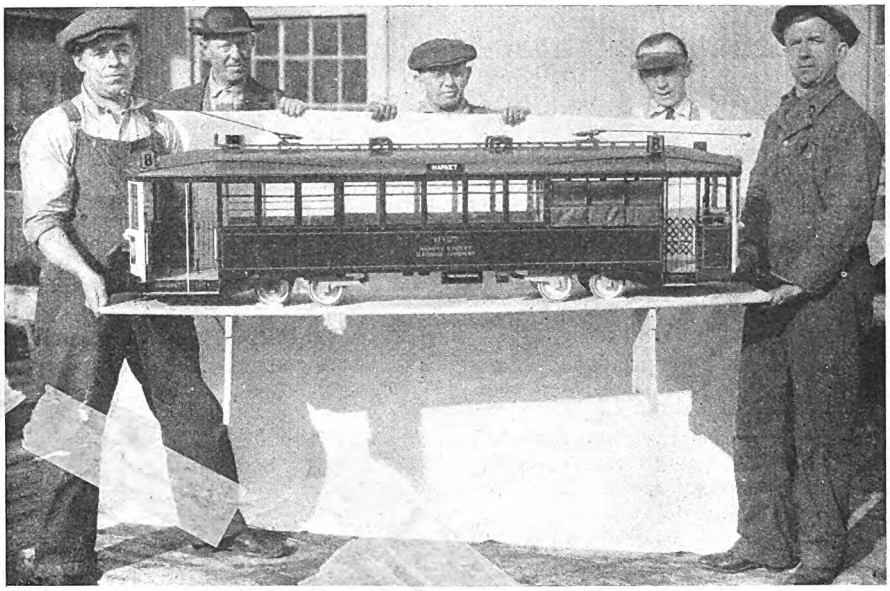
Model of Latest Type California Car

Shopmen of the Market Street Railway, San Francisco, have built a model of the latest type California car, constructed to scale and complete in every detail with the exception of lights and motors. The wheels are equipped with rubber tires so the model can be used for display purposes. The front and rear ends are painted white, but the body is painted the regulation color. One end is equipped with side curtains. The window frames are equipped with glass. Fenders are placed at the front and rear ends. Each department in the shop made the same parts for the model that it builds for its big brothers. The men who did the work are shown in the accompanying illustration. From left to right they are as follows: W. A. Crocker, body builder; Al Haug, tinsmith; John H. Wallbrink, machinist; H. M. Rist, painter, and T. Thomas, foreman car builder.



Another California wonder appears

Cars Run Express and Buses Local in Detroit

A combination of express cars and local buses will soon be tried by the Detroit Department of Street Railways at Detroit, Mich., on Jefferson Avenue. The express car service planned on Jefferson Avenue will be from St. Jean Avenue to Bates Street with five ½-mile stops. The 60-day trial will suffice, it is expected to establish the merits or demerits of the express car idea. It is hoped that the limited number of stops will enable the cars to maintain a schedule of fourteen miles an hour. Some months ago a similar express car-local bus service system was suggested on Woodward Avenue as a modification of the Miller-Shorn system, but the plan was not put into effect. A uniform rate of fare of 6 cents will be charged on buses and street cars alike with a 1-cent transfer charge.

The splitting of the Jefferson-Grand River line has also been approved by the Council, a step which General Manager Del A. Smith estimates will save the department $225,000 a year in operating expenses. The cars will be rerouted through Capital Park. The Jefferson line will turn north at Bates Street and proceed by way of Farmer Street, Gratiot Avenue and State Street and Griswold Street back to Jefferson Avenue. The Grand River cars will go south from Grand River Avenue into Shelby Street at Capital Park and return to Grand River Avenue through State Street and Cass Avenue, thus separating the former line into two sections.

Audit of Atlanta's Books to Be Made

An audit of the books of the Georgia Power Company, Atlanta, Ga., in connection with its plea for increased fares has been ordered by the Georgia Public Service Commission and will be undertaken by the Audit Company of the South. The petition for increased fares is based largely upon the alleged inability of the company to earn a fair return upon its railway property at present rates. The company is seeking, among other things, a 10-cent cash fare.

Accidents Reduced in Oklahoma City

The plan of giving monthly cash bonuses to teams making the best safety records has brought greater safety to the public riding on city and interurban cars of the Oklahoma Railway, Oklahoma City, Okla. Only 87 accidents happened on Oklahoma Railway lines during June, as against an average last year of 100 accidents monthly. One team, led by W. L. Parsons, made a perfect safety record for June and was awarded the $100 cash bonus for that month.

Hartford Tax Case Set

The case of the city of Hartford, Conn., against the Connecticut Company is scheduled for Oct. 4. The city is suing the railway company for $100,000, or 2 per cent of the gross fares collected by the railway inside the city limits in 1923 and 1924. This tax has been collected annually by Hartford over a period of 30 years. In recent years the tax has amounted to approximately $50,000 for the twelve months period. Several months ago the Connecticut Company opposed the collection of the tax on the grounds that it was illegal. In a trial before Judge Newell Jennings the contention of the railway was upheld. The city appealed the decision.

No Financial Subsidy for Tacoma Railway

In two letters to the City Council of Tacoma, Wash., regarded as having special significance in view of the approach of the date when the Tacoma Railway & Power Company must have its reply to the report of Kenneth G. Harlan, city utilities engineer, ready for final discussions of the railway situation, Richard T. Sullivan, manager of the company, told the Council recently that his company has been cut off from financial relief by its parent company, and must default in its bond interest, and that it will refuse to pave between tracks on South Yakima Avenue. Failure to earn money above operating expenses and taxes sufficient to pay interest on bonds outstanding has forced the company to notify its bondholders of the coming default.

The directors of the Puget Sound Power & Light Company, holding company of the local concern, which has heretofore loaned funds to the subsidiary, has refused to finance it further, reported Mr. Sullivan.

The June figures for operations of the Tacoma lines showed a little improvement over a similar month of 1926, but the net income was still $13,500 short of the amount the Council and the company agreed should be a net return. The report stated that net income for the first six months of 1927 was $35,503 greater than similar months of 1926, but expenses were $55,821 greater, due to increased car and added bus service, so that the company was actually $24,683 worse off than the first half of 1926.

In declining to pave on South Yakima Avenue, Mr. Sullivan pointed out that its franchise on that street did not call for paving. He suggested the requirement ought to be uniform throughout.

Rainier Property Would Continue Round Trip Rates

The Seattle & Rainier Valley Railway, Seattle, Wash., has filed a request with the Department of Public Works at Olympia for a continuation of the special round-trip fare of 25 cents between Renton and Seattle. An extension until January is sought.

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Fare Evidence Before Illinois Commission

Evidence to support its petition for an increase in fare in Moline, Rock Island, East Moline and Silvis was presented by officials of the Tri-City Railway at a hearing before Commissioner Hunt of the Illinois Commerce Commission. The cities of Moline and Rock Island will present their evidence at the final hearing on the petition before the commission in Springfield on Sept. 7 in support of their claim that the increase is not justified.

The company asks permission to discontinue selling tickets at the rate of seven for 50 cents and fifteen for $1. It asks that tickets be sold three for 25 cents only. No increase in the 10-cent cash fare is asked.

Rescinds Paving Relief Act in Atlanta

By a vote of 24 to 7 the Atlanta, Ga., City Council has decided to rescind the action of the 1926 City Council, which authorized relief to the Georgia Power Company of 25 per cent of its street paving assessments. Councilmen opposing the rescind motion pointed out that the 1926 Council had refused to allow increased fares and to grant the company relief from gross receipt tax charges, but after public hearings covering a period of six months had decided to allow partial relief from paving charges, to the extent of reducing those charges 25 per cent. The majority of the members felt that reductions would be unwise, "particularly in view of the 10-cent fare petition now pending."

Advertising Increases Receipts at Little Rock

An increase of 55 per cent in net earnings of the railway department of the Arkansas Power & Light Company in Little Rock for the first quarter of 1927 over the first quarter of 1926 is shown in a report recently compiled by Paul Grier Wilson, advertising manager of the company.

Net earnings for the first quarter of 1927 were $48,818, compared with $31,540 for the first quarter of 1926. The largest saving on expense was made on maintenance of equipment, which was reduced 30 per cent. Cost of maintenance of ways and structures declined 14 per cent. The second largest item of decrease was power cost. That showed a decline of 19 per cent. The cost of conducting transportation was 6.5 per cent less than for the corresponding period of the previous year. General and miscellaneous expense, including taxes, was 4.8 per cent less.

Higher Rates Sought in Santa Barbara

The Santa Barbara & Suburban Railway, Santa Barbara, Cal., has applied to the Railroad Commission that the present 8-cent fare be increased to 10 cents, 7-cent token fare be increased to 8⅓ cents, and the $1 weekly pass to be $1.50. The applicant sets forth that it has a deficit of $14,934 for the first six months operation in 1927, and an accrued deficit of $141,205. The company hopes the requested increases will enable it to maintain its present standard of service and make legitimate operating expenses, interest on funded debt and a reasonable allowance for depreciation.

British Columbia Celebrates Thirtieth Anniversary

Twenty-four employees who had been with the British Columbia Electric Railway, Vancouver and Victoria, for 30 years or more were presented with gold watches recently by George Kidd, president of the company. The occasion was the 30th anniversary of the taking over of the electric light and power and railway property by the company from its predecessors. The total length of service of the old-timers was 815 years, or nearly 33 years each. They appear in the accompanying illustration with George Kidd, president, W. G. Murrin, vice-president, and F. R. Glover, general executive assistant.

Problem Over Houston Fare

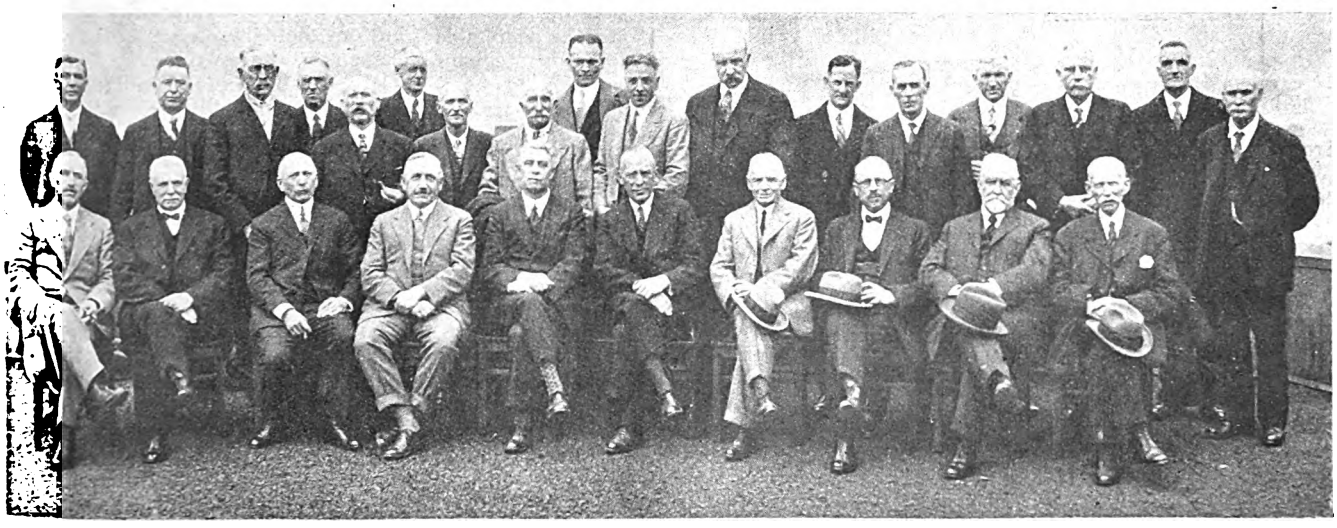
Negotiations are going on between Postmaster Nichols and the management of the Houston Electric Company, Houston, Texas, regarding satisfactory fares for post office employees under the new fare schedule in that city. Mr. Nichols said that the employees could not take advantage of the best rate. Heretofore, these employees paid fares entirely with tokens. Now the pass system offers the best rate but cash is required and the Government did not permit them to pay fares with money. Mr. Nichols said that there were about 90 employees who rode the street cars and buses anywhere from two to four times daily.

P. A. Y. E. System to Be Restored in Tacoma

Pay-as-you-leave collection of fares on outbound trips will be abandoned and the old system of paying as you enter, will be re-established on the lines of the Tacoma Railway & Power Company, Tacoma, Wash., according to a statement of Thomas F. Marsh, superintendent of transportation. The pay-as-you-leave system was established soon after the city and company got together on an agreement for experimental railway operation, the object being to save time in loading at downtown corners and thus speed service. According to Mr. Marsh, so little time is saved that running time cannot be changed, and confusion is caused by different systems for inbound and outbound cars.

One-Man, Two-Man Cars Operate

One-man, two-man cars are operating on the Broadway-East Kildonan and Morse Place line of the Winnipeg Electric Company, Winnipeg, Man. This type of car has been operated successfully on Sargent, Notre Dame and other lines in the city for some time. The arrangement means that in the busy sections, where loading is heavy, cars will be operated by two men.



Twenty-four strong reasons for rejoicing in British Columbia

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Recent Bus Developments

Express Service for West Toledo

A new express motor coach service for West Toledo, Ohio, will probably be authorized to supplant the feeder service recently established in connection with the Cherry Street car line of the Community Traction Company. Legislation to this end has been introduced into the City Council.

Following the barring of interurban buses from picking up or discharging city passengers in that district the railway established a new crosstown and feeder service in the district. However, a lengthy petition to the Mayor and objections of several hundred residents of the section of the city brought forth the plan of express service advocated by Commissioner E. L. Graumlich. The Sylvania Buses, Inc., had threatened also to start a local line within the city limits.

No bus legislation has been enacted because of the apparent effort to settle the entire transit problem by a unified bus and railway service by one company.

Buses Operate in Salem

The Salem Street Railway, Salem, Ore., instituted bus service on all its routes starting on Aug. 1, thus eliminating the last vestiges of the railway line. The new service according to Thomas L. Billingsley, superintendent of the company, offers distinct improvement. Long stopovers are avoided and more people are accommodated with a speeded up schedule. Several big buses, borrowed temporarily from other points, will be replaced with special new buses within a short time. The service as installed will be subject to such adjustment as seems necessary after its trial operation. The Salem Street Railway has always specialized in service to groups, such as the State House, large canneries and other mills and state institutions, and will continue to do so with the buses.

Would Substitute Buses on Line in Jamestown

The Jamestown Street Railway, Jamestown, N. Y., filed on Aug. 5 with the Public Service Commission a declaration of abandonment of its Lakewood line, extending from Jamestown to Beechwood, and asked for approval thereof. At the same time, Jamestown Motor Bus Transportation Company, Inc., filed a petition for a certificate for a bus line from Jamestown to Lakewood.

The petition alleges that the railway line has not been operated profitably for several years and in its opinion cannot be operated at a profit; that repairs to the tracks would be necessary if the line were continued, and that in the judgment of the company it should be abandoned and service by bus substituted.

The bus company is a subsidiary of the railway and alleges that by using Fairmount Avenue and Lakewood Road for bus service, it can avoid a grade crossing and serve a new settlement beyond the Beechwood terminus of the present car line at the same rate of fare, with transfer privileges. Public hearings will be held on these applications.

Co-ordinated Service in Southern Indiana Popular

The Evansville & Ohio Valley Railway, operating from Evansville to Mount Vernon, Ind., Rockport and Grandview, Ind., and Henderson, Ky., is well pleased with the bus line installed several years ago to run from Grandview, the terminus of one of the lines to Tell City, Ind., and Cannelton, Ind. The buses connect with the cars at Grandview. Traveling men who "make" that territory have been enabled to cover their beats much more expeditiously than before.

New York Grants in Court

Franchises awarded recently to Equitable Coach Company attacked as unfair—Defense by Transportation Chairman Delaney

MAYOR WALKER of New York has expressed the belief that Stewart Browne, president of the United Real Estate Property Owners' Association, who is suing to prevent the award of the bus franchise in the Boroughs of Manhattan and Brooklyn to the Equitable Coach Company on the ground that the award was illegal, is too late in his injunction suit. The Mayor believes that his signature on the resolutions of the Board of Estimate and Apportionment, granting the franchise to the Equitable, is tantamount to the signing of the franchise itself. The resolutions were signed before the papers in the injunction suit were served.

Mr. Browne, however, was not to be dissuaded. The charge that Mayor Walker denied any opportunity for a public hearing on the tri-borough bus franchise was made on Aug. 8, before Justice Curtis A. Peters in the Supreme Court by Solomon Sufrin, attorney for Mr. Browne, in argument to support a motion to grant Mr. Browne's application for an injunction to restrain the city from delivering the contract.

Mr. Sufrin declared that this alleged failure of the Mayor to permit a public hearing, as required by law, was one of two grounds on which Mr. Browne sought the injunction. The other ground, he said, was that the terms of the franchise granted to the Equitable Company were much less advantageous than offers made by competing companies.

The point as to whether or not Mayor Walker refused to grant a public hearing seemed to depend largely, so far as the argument was concerned, upon Mr. Browne's hearing. Mr. Sufrin said that Mr. Browne contended that the Mayor called the number of the resolution in a low voice and directed the clerk to call the roll on it, without permitting opponents of the grant of a franchise to the Equitable Company to speak. Mr. Sufrin admitted that the minutes of the Board of Estimate showed that there was no objection to the franchise before the vote, but insisted that there had been no opportunity for objection.

Mr. Nicholson on behalf of the city presented an affidavit by John H. Delaney, chairman of the Board of Transportation, who denied that the Mayor had spoken in a low voice at the meeting and denied Mr. Browne's charge that the offers of the Manhattan Surface Coach Company and the Coney Island & Gravesend Bus Corporation were more favorable to the city than that of the Equitable Company.

In his affidavit Mr. Delaney discussed the comparison between the offer of the Equitable Company and its competitors submitted by Mr. Browne in his complaint in the action, to show that the conclusions drawn from it were unfair. Mr. Browne's comparison follows:

Company	Route-Miles	Borough	Compen. to City, Per Cent	Min. Guar.
Equitable.....	18.9	Manhattan	5	$80,000
Equitable.....	95.6	Brooklyn..	5	188,000
Equitable.....	114.9	Queens....	5	132,000
Manhattan Surface Coach Co..	19.3	Manhattan	*5	200,000
C. I. & G. Co....	81.6	Brooklyn..	5	100,000
Rauchwerger Bus Co.....	114.6	Queens....	5	90,000

* Plus 50 per cent of profits after 8 per cent is earned on capital invested.

Mr. Delaney said that the C. I & G. Bus Corporation, a subsidiary of the B.-M.T. and the Brooklyn City Railroad, had ignored the bus routes laid out by the Board of Transportation and had laid out their own bus routes to be supplementary to surface car operation solely to support and enhance the income on trolley lines already crowded to capacity. Mr. Delaney said that the C. I. & G. corporation also proposes to operate certain bus lines only during the Summer months, when operation would be profitable, leaving the public without service in the period of the year when it would be most necessary.

Mr. Delaney said that the offer of the Manhattan Surface Coach Company to pay the city 50 per cent of the profits after 8 per cent was earned on its capital invested really amounted to nothing tangible. The Equitable Company, he said, offered a percentage of all revenues, while the Manhattan Company offered no part of revenues which might be derived from passengers paying their

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original fare on surface cars and then transferring to bus lines.

Mr. Delaney said that the comparison made in Mr. Browne's complaint that the Equitable Company guaranteed a minimum return to the city of only $80,000 a year for the Manhattan franchise, while the Manhattan Surface Coach Company guaranteed $200,000, was misleading. Mr. Delaney said that the Equitable Company guaranteed a minimum return to the city of $400,000 a year for all three boroughs and that the only purpose of using $80,000 as the figure for Manhattan was to provide a basis for computing the effect of the elimination of mileage should the Transit Commission deny certificates of convenience and necessity for certain routes or should the company be prevented otherwise from operating all the routes authorized.

Mr. Delaney said that consideration should be given to the question of whether the Manhattan Surface Coach Company, as a subsidiary of the New York Railways, and the C. I. & G. Bus Corporation, as a subsidiary of the electric railway companies in Brooklyn, would not operate buses in order not to compete with existing surface lines or produce a result which would reduce the income of the trolley companies. In conclusion Mr. Delaney said:

The additional transportation service which is offered by the Equitable Coach Company is very great, and the relief to be given is long delayed. Further delay in effecting such service through a proper execution and delivery of the contract would create very great inconveniences and visit hardships upon the people of the city.

Another Iowa Interurban Service

There will soon be two bus lines running through Cedar Falls daily on the Mason City stretch. The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, has been granted permission by the State Commission to operate passenger buses over this territory, heretofore covered by the buses of Helen Schultz.

Special Levy on Georgia Bus Companies Vetoed

After a spirited debate, the Georgia State House of Representatives defeated a $25 per county tax upon bus lines by the overwhelming vote of 121 to 52. Thus bus lines traversing ten counties, as the lines from Atlanta to Macon, would have been compelled to pay a total tax of $250 under the provisions of the act. Numerous amendments were offered to the original measure written by the ways and means committee, but only one was accepted. This was an amendment exempting from the provisions of the act bus companies engaged solely in the business of transporting children to and from rural schools. However, defeat of the original measure defeated the amendment also. The outcome was a decided victory for bus companies.

2,100 Picnickers Handled by Bus

When executives of the Mullins Body Corporation of Salem, Ohio, asked the Youngstown & Suburban Railway for a proposition on the transportation of all of their employees by motor coach from their plant in Salem to Idora Park, Youngstown, for the annual picnic, the railway management knew it was going to be an undertaking that would require careful study and planning. The Mullins body people first said they expected about 500 to attend, but every day brought reports of an increased number, until the night before the outing they telephoned that about 1,200 were expected.

The traffic department then worked out a schedule, whereby 25 coach loads left Salem starting at 7 a.m., and the return movement was started from Idora Park at 6 p.m. The railway used every one of its own coaches and borrowed four from the Pennsylvania-Ohio Electric Company. The distance from Salem to Idora Park is 22 miles, and 2,100 passengers were handled. Negotiations are now under way for a community picnic from Salem to Idora Park, the movement to be made in the same manner.

Public Convenience in Yonkers Transcends Existing Rights

The Public Service Commission on Aug. 5 issued certificates for the operation of seven bus lines in Yonkers, N. Y., to the Merchants Community Bus Transit, Inc., and denied seven other petitions of this company and the petition of Robert Tostanoski. Orders were based on memoranda of Commissioner Van Namee, who made personal inspections and an intensive study of the transportation problem in Yonkers.

Some of the petitions to the commission were opposed by the Yonkers Railroad, which has furnished transportation in Yonkers for the past forty years. That company showed at the hearing that it carried upwards of 62,676 passengers a day. It also showed a loss in operations for the past ten years, varying between $67,000 in the lowest to $161,000 in the highest. Its balance sheet for Dec. 31, 1926, showed a deficit in "corporate surplus" of $1,826,513 while its net loss from operations in 1926 was $114,811.

The commission said that bus operation would not be authorized in direct competition with a railway which by the preponderance of evidence was giving adequate service. Certificates would have to be denied for those routes in direct competition with the Yonkers Railroad except in cases where the loss of the railroad must be overlooked because of the public convenience and necessity served by the competing bus lines. Commissioner Van Namee's memorandum went into detailed discussion of each route separately, method of operation, fare and equipment, finances of operation and the financial responsibility of petitioners.

The rate of fare authorized under the local consents of the city was 5 cents, except that on longer routes where division into zones was made, the fare was 5 cents in each zone.

Stands on Its Bus Award to Grand Rapids Interurban

The Michigan Public Utilities Commission refused on Aug. 3 to modify or rescind its order granting the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., a permit to operate buses between the terminal points of its lines. Thus this case is again thrown for decision into the Ingham County Circuit Court at Lansing. This decision may be final, unless the point at issue between the Michigan Public Utilities Commission and the Safety Coach Company should be appealed to the State Supreme Court, as now seems probable. The Safety Motor Coach Company had appealed to the court for a restraining order, directed against the commission, halting the interurban company from putting its buses into operation.

A hearing on the merits of the order was held at Lansing on July 18. Testimony was offered by the former members of the Public Utilities Commission, prominent residents along the railway line and the former owner of the Safety Motor Coach Company. The three mentioned litigants, the Grand Rapids Trust Company, receiver for the defunct railway, and the cities of Grand Haven and Muskegon Heights had previously petitioned the courts to appear as parties defendant and their request was granted.

The statutes provide that in an appeal from an order directed by the Public Utilities Commission, the new testimony must be submitted to the state body for review. The members are then empowered to alter their order if the testimony has any bearing on their action, or then may affirm their original order. By their decision on Aug. 3 the members of the commission stand on record on granting the bus permit to the interurban company.

Detroit's Automobile Code Considers Moderate Drivers

It's the moderate driver in Detroit, Mich., who gets there. Speeders and slow pokes are out of the running in the new traffic code which sets 20 miles an hour as the standard for making good time. The system now in vogue in that city is known as the "progressive plan," whereby those who drive at the 20-mile rate will find the "go" light showing as they approach each intersection. Whenever a driver goes faster or slower he will be confronted by the "stop" light each time he nears an intersection. *Public Safety,* published by the National Safety Council, states that Detroit drivers and tourists are unanimous in their praise of the innovation.

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Financial and Corporate

Recently Organized Grand Rapids Company Issues Report

A statement of earnings of the Grand Rapids Railroad, Grand Rapids, Mich., for the two months and twelve months ended June 30, 1927, has been presented to the stockholders. These figures, shown in the accompanying table, are actual since May 1, 1927, the effective date of the organization of this company and prior thereto, give effect to the adjustment of interest and amortization of discount and expense due to the reorganization of the property.

	For Two Months Ended June 30, 1927	For Twelve Months Ended June 30, 1927
Gross earnings	$270,401	$1,745,965
Operating expenses, including taxes and maintenance	181,026	1,187,700
Gross income	89,375	558,264
Fixed charges	47,753	261,789
Net income	41,622	296,475
Provision for retirement reserve	20,249	170,888
Balance available for dividends and other corporate purposes	$21,373	$125,587

In accordance with the plan of readjustment of the Grand Rapids Railway, dated April 11, 1927, the Grand Rapids Railroad was organized under the laws of Michigan on April 15, 1927, and as of May 1, 1927, acquired all the assets and assumed all of the liabilities of the former company, including its outstanding bonds. The $600,000 of floating debt has been surrendered by the holders thereof and canceled, and in addition the $200,000 of first mortgage bonds authorized have been sold. The proceeds of the bonds and the funds received in payment for the new preferred stock have been used to retire the car trust notes and bank loans previously outstanding.

Commission Denies Brooklyn Company's Bond Sale Plea

The New York Transit Commission late on Aug. 5 denied the application of the New York Rapid Transit Corporation for permission to issue $20,000,000 of 5 per cent bonds and to sell them to the parent company, the Brooklyn-Manhattan Transit Corporation, at 80 per cent of par.

The decision of the commission was unanimous, Commissioners Gilchrist and Godley concurring in the opinion held by Commissioner Lockwood, who conducted the hearings. The contentions of Samuel Untermyer, special counsel of the commission, that the proposed financing was not in the best interests of the city were upheld and the several alternate methods of financing which he proposed were indorsed by the commission.

Mr. Untermyer contended that of the difference of $4,000,000 between the face value of the bonds and the price at which they were to be sold to the Brooklyn-Manhattan Transit about $3,000,000 would be a charge against the city, inasmuch as $12,000,000 of the money was to be used for the purchase of equipment, mostly steel cars, to be operated on the city owned subways run by the Brooklyn-Manhattan Transit Corporation. This charge of $3,000,000 would become a direct payment with 15 per cent premium added, according to Mr. Untermyer, in the event that the city should decide to recapture its subways from the Brooklyn-Manhattan Transit to form a unified system.

Mr. Untermyer suggested that the steel cars could be purchased with the proceeds of the company's prior lien bonds or by the issuance of equipment trust certificates. The company objected to the issuance of the prior lien bonds on the ground that they should be reserved for possible future financing requirements of the system. It contended that the sale at this time of first and refunding bonds to yield $16,000,000 would constitute a breach of faith toward the holders of the 6 per cent bonds of the B.-M. T. The commission suggested competitive bids be secured for the bonds.

Improved Showing in St. Louis

United Railways of St. Louis shows improvement in 1926—Interest charges reduced—Sunday and evening riding falls off

THE comparative income and expense statement incorporated in the 27th annual report of the United Railways, St. Louis, Mo., showed a deficit of $43,564 for 1926, compared with a net loss of $206,174 for 1925. Receiver Wells filed the report with the United States District Court on May 26. Gross operating revenue for 1926 was $18,873,430, a decrease of $21,143, but the gross income totaled $2,631,168. Passenger revenue alone was $18,601,698, compared with $18,628,734 in 1925, the decrease being $27,036. Interest and miscellaneous charges for the year were $2,677,568, accounting for the net loss from operations of $46,400. A credit of $2,835 for income derived from rental of bus equipment cut the net loss to $43,564. The decrease in net loss is accounted for in part by the fact that the interest charges for the year were reduced through the retirement of $4,100,000 of underlying bonds and $4,200,000 of receiver's certificates, which were taken up at the call price of $100.50 and accrued interest.

The radio was an adverse element the United Railways had to combat during 1926, according to Receiver Rolla Wells. Material gains on bus competition were made during the year, but radio entered the lists against the car system and materially reduced travel on Sundays and during the evening hours. The enormous sales of radio outfits, the report states, have greatly increased the number of stay-at-homes, with a resultant decrease in street car riding.

On the other hand, the ordinary weekday morning and evening peak hour travel is apparently about as heavy as ever, and perhaps somewhat heavier than it was. While the number of cars on the basic schedule throughout the greater part of the day was the same as a year ago, the number of cars in service at the morning peak hours at the beginning of January, 1927, was 24 greater

INCOME STATEMENT OF THE MISSOURI ELECTRIC RAILROAD

	Year Ended Dec. 31, 1926	1925
Revenue from transportation	$183,179	$154,897
Revenue from other railway operations	2,571	2,505
Gross operating revenue	$185,751	$157,403
Current operating expenses and depreciation	$172,608	$160,252
Taxes	13,312	13,709
Total operating expenses, depreciation and taxes	$185,921	$173,962
Loss from operation	*$170*	*$16,559*
Non-operating income	1,206	1,521
	$1,035	*$15,037*
Interest on bonded debt	$35,000	$35,000
Net *loss* for the year from railway operations	*$33,964*	*$50,037*
Net *loss* from bus operation	*21,450*	*9,507*
Net *loss* for the year	*$55,504*	*$59,544*

Italics denote decreases.

STATEMENT OF CAPITAL EXPENDITURE MADE BY THE UNITED RAILWAYS, ST. LOUIS—1926

Way and structures	$222,147
Equipment	12,275
Power	26,624
Total additions	$261,04
Deductions:	
Way and structures	$33,363
Equipment	117,982
Power	6,277
Total deductions	$157,623
Net addition during the year	$103,424

REVENUE BUS AND RAILWAY PASSENGERS IN ST. LOUIS

	Revenue Passengers 1926	1925
United Railways:		
City lines	258,085,090	258,999,867
County lines	11,470,640	11,105,533
	269,555,730	270,105,400
Missouri Electric Railroad	2,779,989	2,190,390
Total electric railways	272,335,719	272,295,790
Missouri Electric buses	204,049	22,450
St. Louis Bus Company buses	4,707,709	2,607,809
Total	277,247,477	274,926,049
Peoples Motorbus Company	23,070,442	23,814,803

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than at the beginning of January, 1926, and the number at the evening peak hours 27 greater.

The average miles per hour (including terminal delays) for 1926 was 9.74, compared with 9.76 in 1925 and 9.73 in 1924.

A great deal of attention was paid during 1926 to the more scientific making of schedules to fit them to operating conditions at various times of day. The schedule department made a total of 248 new schedules, of which 164 were street car schedules and 84 bus schedules. The results of a better arrangement of the schedule show an increase in average speed.

That the bus competition can be successfully met is clearly indicated by the report for 1926. The figures show a gain of 2,321,428 in the number of revenue passengers for the street cars and the buses of the St. Louis Bus Company, auxiliary of the railway, while the People's Motorbus Company, the competing city-wide bus system, suffered a loss of 744,361 revenue passengers.

The number of revenue passengers on the United Railways city railway lines dropped 549,670, but this loss was more than offset by the increase in patronage for the St. Louis Bus Company. These figures, shown in the accompanying statement, indicate that the company gained materially on motor bus competition, Receiver Wells states, but competition from service cars and privately owned automobiles has been increasing steadily.

As a result of bus competition and the increased use of private automobiles and service cars the report declared street car fares fell off greatly in 1924, with somewhat further declines in 1925 and 1926, while at the same time the company's taxes increased and additional expenses were incurred in endeavoring to overcome the increased traffic problems produced by the added street congestion.

The report states that during the past three years the receipts of the property have been insufficient to provide adequately for the operation and maintenance of the property in the hands of the receiver and to pay a reasonable return on the value. The receiver desired to postpone as long as possible an increase in the rates of fare, but the situation became so acute that on June 4, 1926, pursuant to order of the United States District Court, the receiver filed an application with the Missouri Public Service Commission for an increase in the rates of fare. Then follows a recital of the various subsequent steps up to the plan of the receiver to give to each passenger a receipt for 1 cent for each 8-cent cash fare paid or receipt for 1 cent for each 15 cents paid for two tokens, such receipt to be redeemed at the office of the receiver in case the United States Court should on final hearing declare the tariff of Feb. 7 void.

The secured debt outstanding on Dec. 31, 1926, was $52,590,000, compared with $54,890,000 on Dec. 31, 1925, a reduction of $2,300,000. On April 1, 1926, $6,000,000, par value, United Railways of St. Louis first general mortgage 4 per cent bonds reserved to retire underlying liens were sold to the reorganization committee at par and the proceeds used as follows: $4,100,000 to retire $986,000 Compton Heights Railroad's 6's, $1,640,000 Cass Avenue Railway's 6's and $1,474,000 Lindell Railway's 8's, all of which matured on Oct. 1, 1923; $1,900,000, applied as part payment of $4,200,000 series "B" 6 per cent receiver's certificates called for payment April 1, 1926, at 100½ and accrued interest.

FUNDED DEBT OF THE UNITED RAILWAYS, ST. LOUIS

Issue	Total Outstanding Dec. 31, 1926
United Railways of St. Louis first general mortgage 4's, due 1934	$36,300,000
St. Louis & Suburban Railway consolidated mortgage 8's, due 1923	2,000,000
St. Louis & Suburban Railway general mortgage 5's, due 1923	4,500,000
St. Louis Transit Company's 5's, due 1924	9,790,000
Total	$52,590,000

The balance due on principal of receiver's certificates, together with accrued interest and premium for calling the issue before maturity, aggregating $2,447,000, was paid by the receiver from funds on hand. These changes have resulted in a saving of interest charges of $287,480 per annum.

All back interest on funded debt, amounting to $3,670,715, the payment of which had been withheld pending court orders, was paid by the receiver during the year; also all current year's interest on funded debt has been paid on regular interest dates, including interest on matured bonds of the St. Louis & Suburban Railway and the St. Louis Transit Company.

In addition to direct taxes, the United Railways expended $344,668 for paving and furnished free transportation for the police and firemen of St. Louis. There was also expended and charged to operating expenses an amount of $8,458 for carrying tracks over or around new sewers. The total taxes, street paving cost and expense on account of city sewer construction, were $2,196,081.

The total mileage in single track on Dec. 31, 1926, was as follows:

	Miles
City track	346.6873
County track	115.6328
Total	462.3201

During 1926, 0.09945 mile of track was added and 1.5544 miles was removed.

Since 1904 the amount of track reconstruction, renewal and extensions of track was as follows:

Year	Miles	Year	Miles
1904	21.56	1917	19.72
1905	8.90	1918	15.80
1906	29.18	1919	25.01
1907	21.65	1920	26.50
1908	32.99	1921	29.82
1909	39.93	1922	23.54
1910	45.34	1923	26.82
1911	32.69	1924	26.24
1912	25.85	1925	17.28
1913	27.72	1926	14.66
1914	21.77		
1915	28.05		
1916	15.39	Total for 23 years	576.41

CONDENSED INCOME ACCOUNT OF THE UNITED RAILWAYS, ST. LOUIS, FOR YEARS 1921 TO 1926, INCLUSIVE

	1926	1925	1924	1923	1922	1921
Revenue from transportation	$18,641,871	$18,669,775	$19,288,743	$20,220,765	$19,740,118	$19,498,946
Revenue from other railway operations	231,559	224,798	226,531	232,679	223,437	159,604
Gross operating revenue	$18,873,430	$18,894,574	$19,515,275	$20,453,445	$19,963,555	$19,658,551
Operating expenses (including depreciation)	14,626,848	14,684,076	15,093,195	15,123,183	14,895,508	15,093,218
Surplus over operating expenses	$4,246,582	$4,210,498	$4,422,080	$5,330,262	$5,068,047	$4,565,332
Taxes	1,818,288	1,810,701	1,772,134	1,832,602	1,845,722	1,675,697
Income from operation	$2,428,294	$2,399,796	$2,649,945	$3,497,659	$3,222,324	$2,889,635
Income from other sources	202,873	285,449	287,870	225,700	202,830	216,349
Gross income (less operating expenses and taxes)	$2,631,168	$2,685,246	$2,937,816	$3,723,359	$3,425,155	$3,105,985
Deduction from income	2,677,568	2,892,514	2,907,939	2,913,614	2,912,063	2,802,939
Net income—railway	*$46,400*	*$207,268*	$29,876	$809,745	$513,091	$303,045
New rental income from bus equipment	2,835	1,093	0	0	0	0
Dividends	0	0	0	0	0	0
Surplus	*$43,564*	*$206,174*	$29,876	$809,745	$513,091	$303,045

Figures in *italics* denote deficit.

TRAFFIC STATISTICS

Revenue passengers	269,555,730	270,105,400	279,222,520	292,671,781	286,076,475	282,447,190
Transfer passengers	145,503,573	145,698,764	149,555,651	155,343,193	152,261,868	150,562,354
Total passengers	415,059,303	415,804,164	428,778,171	448,014,974	438,338,343	433,009,544
Percentage of revenue passengers using transfers	53.98	53.94	53.56	53.08	53.22	53.31
Average fare per passenger (including transfers), cents	4.48	4.48	4.49	4.50	4.49	4.49
Average fare per revenue passenger, cents	6.90	6.90	6.89	6.89	6.89	6.89
Passenger car-miles	42,135,498	42,440,837	43,911,064	45,652,714	44,229,300	44,229,210
Revenue passengers per car-mile	6.40	6.36	6.36	6.41	6.47	6.39
Total passengers per car-mile	9.85	9.80	9.76	9.81	9.91	9.79

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COMPARATIVE CLASSIFICATION OF PASSENGER REVENUES FOR UNITED RAILWAYS
YEARS 1926–1925

	Days	Year 1926	Days	Year 1925	Increase or Decrease	Per Cent Increase or Decrease
Total		$18,601,698		$18,628,734	*$27,036*	*.15*
Average day	365	50,963	365	51,037	*74*	*.15*
Average week-day	256	53,735	257	53,637	98	.18
Average Saturday	51	55,308	50	55,394	*85*	*.16*
Average Sunday	52	35,086	52	35,931	*845*	*2.35*
Average holiday	6	33,349	6	34,280	*831*	*2.42*

Holidays: New Year's Day, Decoration Day, Independence Day, Labor Day, Thanksgiving, Christmas.
Italics denote decrease.

The number of passenger cars owned at the end of 1926 was 1,587, of which 1,408 were motor cars, and 179 trail cars. This compared with 1,608 at the end of 1925, 1,638 at the end of 1924.

Twenty-one passenger cars and one work car were retired from service and destroyed during 1926. One hundred and fifty-one cars were remodeled by changing old type folding step to well-type step, with manually operated doors. One hundred and fifty-two cars were provided with special sash at conductor's booth to give conductor a clear view. Alterations were made on twenty-one trail cars by extending floor over "well" in center of car, and changes in conductor's booth. On 279 cars which had very narrow aisles, seven cross-seats on the open side and six cross-seats on the closed side were removed and replaced with longitudinal seats.

General overhauling and repainting	404
Car body and collision repairs	1,431
Truck and motor repairs	182
Revarnishing	317
Total	2,334

This total compared with a total of 2,305 cars in 1925 and 2,245 in 1924.

In the miscellaneous equipment eighteen buses were overhauled and repainted and 21 automobiles and trucks generally overhauled and repainted. In addition runabouts and coupes were purchased for the power and transportation departments.

Total number of employees on Dec. 31, 1926, was 5,888, compared with 5,811 on Dec. 31, 1925, 5,803 on Dec. 31, 1924, and 6,014 on Dec. 31, 1923. The maximum number of employees during 1926 was 6,122, compared with 6,269 in 1925 and with 6,361 in 1924. No changes in agreements as to wages and working conditions were made in 1926.

A continuously decreased labor turnover and the reaching of the fourth year scale of wages by an increased percentage of motormen and conductors made some increase in the average wages paid in the transportation department over previous years.

The safety director and his safety committees carried on extensive and intensive campaigns, holding a total of 283 meetings. As a result of this work, the company not only had the smallest number of fatalities, the smallest number of collisions with persons or animals or wagons, the smallest number of accidents connected with shops and sheds, the smallest number of car collisions, disturbances and employees injured, but for the third successive year a material reduction was made in collisions with motor vehicles, the number of such collisions in 1926 being approximately 2½ per cent less than in 1925, in spite of an increase of 14 per cent in the number of registered automobiles in the same year.

Of the 23 fatalities in which the electric railways were in any way concerned, there was only one in which United Railways operations appeared to be primarily at fault. Further, the 23 fatalities from all causes in 1926 compared, for example, with 49 in 1918 (the year before the receivership) and with 119 in 1904. It was also striking that with more than 6,000 employees there was only one fatal accident to an employee during 1926.

The membership of the Employees' Mutual Benefit Association at the end of 1926 was 5,327, including nearly all of those now eligible. Records show that approximately 50,000 medical and surgical treatments were given during the year to members and their families. On the whole, there was a slight decrease in the total number of cases coming under the supervision of the medical department in 1926, the number being about 24,000, compared with 26,000 in 1925. Physical examination of all new employees has been made increasingly thorough.

The Savings and Loan Association reports cash receipts for the year of $2,170,772, which includes members savings and money placed with the association in connection with the purchase of homes. One hundred and nine members finished paying off during the year loans previously made to them for building or buying homes, aggregating $259,711. Loans outstanding Dec. 31, 1926, numbered 1,366, or a total amount of $4,015,636.

The total miles in single main track of the Missouri Electric Railroad on Dec. 31, 1926 was 23.4838. Of this mileage, 7.6551 was double track and 7.8922 single track. In addition to the above there was 0.2814 mile of spur and miscellaneous track. This main track mileage includes 2.5139 miles of track of the St. Louis County Street Railway, which is operated as part of the Missouri Electric.

The number of revenue passengers on the Missouri Electric Railroad in 1926 was 2,779,989, compared with the 1925 number of 2,190,390, and the number on Missouri Electric Railroad buses in 1926 was 204,049, compared with the 1925 number of 22,450. This shows an increase of 35 per cent in the total number of revenue passengers in both electric railway cars and buses in 1926 over 1925.

CONSOLIDATED INCOME AND EXPENSE STATEMENT OF THE UNITED RAILWAYS, ST. LOUIS, YEAR ENDED DEC. 31, 1926

	Amount	
Operating Revenue:		
Revenue from transportation:		
Passenger revenue	$18,601,698	
Special car revenue	31,423	
Express revenue	8,750	$18,641,871
Revenue from other railway operations:		
Station and car privileges	$173,106	
Rent of equipment	4,581	
Rent of buildings and other property	24,336	
Sale of power	29,534	231,559
Gross operating revenue		$18,873,430
Operating Expense and Charges:		
Current operating expense:		
Way and structures	$1,043,915	
Equipment	1,632,447	
Power	1,842,715	
Transportation expense	6,701,177	
Traffic expense	23,686	
Injuries and damages—reserve	1,132,405	
General and miscellaneous	750,499	
Depreciation reserves	1,500,000	
	$14,626,848	
Taxes	1,818,288	
Total operating expense, depreciation and taxes		16,445,136
Income from operation		$2,428,294
Non-Operating Income:		
Rents, less expenses and taxes	$12,300	
Interest on deposits	12,343	
Interest from investments	178,077	
Miscellaneous	152	202,873
Gross income		$2,631,168
Other Deductions:		
Interest on bonded debt	$2,335,370	
Interest on receiver's certificates	63,000	
Interest on bond interest coupons to date of payment	4,545	
Interest on mill tax judgments	143,779	
Amortization of discount and expenses in connection with sale of receiver's certificates, 'Series "B"	56,038	
Income tax on bond coupons	16,524	
Premium on receiver's certificates—Series "B," called for payment April 1, 1926	21,000	
Various expenses in connection with bonded indebtedness and receiver's certificates, payment of interest coupons	34,311	
Revenue stamps in connection with additional issue of general mortage 4's	3,000	2,677,567
Net *loss* for the year from railway operations		*$46,400*
Less: Net rental income from bus equipment		2,835
Net *loss* for the year		*$43,564*

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Book Reviews

Reference List of Literature on Urban Electric Railways

Boston, Mass.: Library Boston Elevated Railway, 160 pages.

The library of the Boston Elevated Railway, Boston, Mass., has an unusual position. Begun very early, it has always been regarded as one of the important departments of the company's activities, and being under competent guidance, it is not surprising that a wealth of literature has been collected. An even more important feature of this material than its abundance is that it has been thoroughly indexed. The latest aid to the users of this library is the publication of a list of the literature possessed on transportation topics in different cities, grouped under the names of the different cities, with a supplementary grouping by topics. Altogether the two lists occupy 160 pages. It would not be correct to say that the Boston Elevated Railway library contains all the printed information which has been issued on transportation in the different cities included, but it is not far from the truth to state that it possesses most of the information that is of the greatest importance. Hence, a list like this is invaluable to the student of transportation affairs in any particular city or in several cities. Nothing is said by the company as to the edition of this list printed, but it is hoped enough are available so that some of the other electric railway libraries can be supplied.

Principles of Mercury Arc Rectifiers and Their Circuits

By David Chandler Prince and Francis Brooke Vogdes, General Electric Company, New York: McGraw-Hill Book Company, Inc. 233 pages. Price, $3.

This book consists of two parts. One considers the rectifiers themselves and the other a study of the circuits in which they operate. The usual condensation of mathematical work for the sake of having it appear in concise form has not been followed, but instead the authors have picked out such mathematical processes as best set forth to their minds the physical conceptions of the problems discussed and have eliminated lengthy algebraic transformations.

The book begins with a discussion of the physics of several simple types of rectifiers and ends with the mercury-arc rectifier. In this, the first part of the book, the authors have included the results of many workers as well as a description of their own work.

In the second part of the book the authors have made use of a mathematical paper by Walter Dällenbach and Eduard Gerecke on the current and voltage conditions in a high-capacity rectifier. This deals with a condition in the rectifier circuit having all the reactance in the secondary winding and the method is indicated whereby more difficult problems can be solved. No attempt has been made to discuss the details of rectifiers as constructed by the various manufacturers at present or the conditions under which they operated.

Office Management

By John H. MacDonald, M.C.S. Prentice-Hall, Inc. 278 pages. Price, $5.

Men, materials, money, methods and machines, their relationship and service to modern business principles and practices are shown in John H. MacDonald's new book, "Office Management." The author has compiled methods which he has worked out in two or three of the largest institutions in the country, and combined research for the last five years, and put them in his text. Mr. McDonald says:

> Business has made rapid strides in the past few years in applying to the field of office management the same fundamental principles of procedure and methods that have been in successful use for years in production work. Present day competition, resulting as it has in smaller margins of profit, has made it essential to give the most careful attention to the efficient organization and management of internal administrative affairs in order that individual productivity may be increased and unit costs reduced.

The growth of business, dependent upon record, is shown by the increase in clerical employees in the United States from 1,631,626 in 1910 to 2,951,008 in 1920. The mass of detail of operation of such large corporations as the Westinghouse Manufacturing Company and the New York Telephone Company, for example, are gathered together, compared and analyzed; and the practices of these various companies are theorized into what might be called a "guide to better business."

Twenty-three chapters are set up under the heads of the numerous departments of an organization such as the advertising, sales, purchasing, mailing, stenographic and filing departments. The subjects are well divided under subheads which tell the story and make it easier for the reader to pick out his point of interest very easily. It tells of the historical background of office management, and dips into the psychology of selection of employees. And with the charts scattered throughout the book, the trends and workings of the companies are well illustrated. The banner chapter, perhaps, "Payment of Office Employees," discusses scientific salary administration.

Every electric railway and manufacturer might very profitably keep this book not on the shelf but on the desk of its executive and administrative officers for their use in direction, control and co-ordination of the organization in which they serve.

Fifty Year Jubilee Volume

By the Maschinen Fabrik Oerlikon, Zurich. 192 pages.

Not many manufacturers now active in the electrical business can show an unbroken existence of fifty years. This, however, is the record of the Maschinenfabrik Oerlikon, which began in 1863 under the name of P. E. Huber & Company. The name was changed in 1876 to Werkzeug- und Maschinenfabrik Oerlikon and in 1886 to the shorter present name. During all this time members of the Huber family were continuously and actively connected with the management as they still are. The volume just issued, commemorating the 50 years' life of the company, is beautifully printed and illustrated. Its contents might be divided into two parts.

The first gives the history of the company and is accompanied with views and data of its plant as it exists today. The second part of the book is devoted to the technical aspects of the company's products, among which, of course, electric railway apparatus has constituted an important part. As early as 1884 the company was conducting tests with experimental electric railway equipment, and in 1888 supplied the electrical apparatus for the first fully equipped electric railway in Switzerland, the line between Vevey, Montreaux and Chillon. From these early efforts to the latest single phase locomotive which the company has built for the Swiss Federal Railways is a long step. The book contains full particulars of this later work in electric locomotive design, of generator and turbine construction and other branches of the output of the company.

Electric Switch and Controlling Gear

By Charles C. Garrard. New York: D. Van Nostrand Company, Inc. Third edition. 784 pages. Price, $18.

The third edition of this book has been revised considerably to correspond with rapid developments which are taking place continually in switch and controlling gear. The main object of the book is to classify this equipment, and to state the principles underlying its design and construction. No attempt has been made to describe all of the products of the different manufacturers. The descriptions given are intended to be representative examples, or for illustrating special principles. Mathematical compilations have been kept as simple as possible, and particular consideration has been given to progress in detailed standardization of switch gear.

The book is divided into eight chapters with ten appendixes. Subjects treated include material and manufacturing methods, apparatus for making and breaking electric circuits, apparatus for preventing a dangerous condition of current, apparatus for regulating the amount of current, apparatus for starting and controlling electric running machinery, low and medium tension switchboards, high tension and extra high tension switchboards and apparatus for protecting electrical machinery, against abnormal electric conditions.

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Personal Items

Two New Vice-Presidents at Atlanta

Charles A. Collier and Frank E. Shumate were elected vice-presidents of the Georgia Power Company, Atlanta, Ga., at the last meeting of the board of directors in Atlanta. Mr. Collier, general sales manager prior to his recent election, was named vice-president in charge of the sales department and Mr. Shumate, who was general attorney, was named vice-president in charge of the law department. Both officials, native Georgians, have been connected with the Georgia Power Company for many years.

Mr. Collier entered the service of the company in March, 1909, following completion of his education at the Georgia School of Technology. Beginning as an inspector of wires and motors and managing small power sales, Mr. Collier advanced rapidly to higher posts in the sales department. There he remained for eighteen years. In February, 1922, he was appointed to the post of general sales manager.

Mr. Shumate became associated with the company in 1919, after having served in the legal department of the Southern Railway in Atlanta, since 1912. He accepted a position as general counsel of the then called Georgia Railway & Power Company and subsidiaries, his duties to that organization being chiefly executive. As a youth he studied law in Dalton, Ga., in the office of his father, the late Col. I. E. Shumate, a foremost lawyer in Georgia in his time.

Julius Theobald with Ohio Company as Manager

Julius Theobald, formerly general superintendent of the Atlantic City Electric Company, Atlantic City, N. J., has been appointed general manager of the Springfield Electric Company, Springfield, Ohio. He succeeds the late P. E. O'Brien. Mr. Theobald has been in Springfield for the last few months as assistant to Mr. O'Brien and performed most of the duties of the general manager during Mr. O'Brien's last illness.

After leaving Ohio State University with the class of 1897 Mr. Theobald almost immediately entered the public utility field by securing employment with the Columbus Edison Company, now known as the Columbus Railway, Power & Light Company and after several years of apprenticeship with the company he entered the service of the Locomobile Company of America at New York.

The Duquesne Light Company, Pittsburg, next placed him in charge of the business department of the entire Monongahela territory. It was at this time that he joined forces with Van Horn Ely, president of the American Railways, now the American Electric Power Company. For fifteen years he was responsible for the operation of several of the subsidiaries of the company. He went from that company to the Atlantic City Electric Company as general superintendent.

H. H. Dartt Vice-President and Manager at Scranton

H. H. Dartt has been made vice-president and general manager of the Scranton Railway, Scranton, Pa., to succeed Jilson J. Coleman, who died in April. Mr. Dartt began work with the Scranton Railway in 1910 as engineer of maintenance of way. In 1926 he was made operating manager, in which capacity he served until his recent appointment.

H. H. Dartt

Mr. Dartt's connections before going with the Scranton Railway were varied. Upon completion of his course of study at Mansfield State Normal School, Mansfield, Pa., he became interested in coal mining and lumbering and worked with his father in these two fields. After four years he left this work and became an engineer for the Northwestern Mining Exchange Company at Dubois, Pa. This was for a short period only. His next connection was with the Lehigh Coal & Navigation Company at Mauch Chunk, Pa. This company he served as field engineer.

In 1908 Mr. Dartt removed to Scranton, where he worked for the Delaware, Lackawanna & Western Railroad. Two years later he joined the Scranton Railway as engineer of maintenance of way, as previously mentioned.

Charles H. Forsgard, who has been general superintendent of the Durham Public Service Company, Durham, N. C., has been appointed to the Community Traction Company, Toledo, Ohio. Mr. Forsgard will succeed James Ashton Gregg, resigned, and will take over the duties of E. B. Emery who will be transferred to the New York office of Henry L. Doherty & Company, managers of the Toledo property, in the capacity of special investigating engineer in the operating department of that company.

Changes Made in Maryland Commission

Ezra B. Whitman, a member of the Maryland Public Service Commission since 1921, has resigned and will be succeeded on the commission by Steuart Purcell, now head of the Bureau of Highways of Baltimore. Mr. Whitman was made chairman of the commission in 1924, but resigned several months later, continuing as a member. He was chairman of Mayor Howard W. Jackson's commission on economy and efficiency, which brought about a reorganization of all the engineering and other departments of the municipal government. Mr. Purcell will devote all his time to the work of the Public Service Commission.

William J. Carr, who was appointed a member of the Railroad Commission by Governor C. C. Young to fill the unexpired term of the late Harley W. Brundige, assumed his duties with the commission on Aug. 5. Mr. Carr is a resident of Pasadena. He was engaged in the practice of law in Los Angeles, when named to the commission. He served as a member of the California Senate during the sessions from 1913-1921 inclusive.

C. H. Mobbs, Springfield, Mass., has resigned his position with the Springfield Street Railway and the Worcester Consolidated Street Railway to join the sales force of the Bemis Car Truck Company, Springfield, as New England representative. Mr. Mobbs is well known among the railway fraternity, having been in charge of the freight and express business of the Springfield and the Worcester companies for the past fifteen years.

OBITUARY

Louis Koepff, an employee of the Southern Indiana Gas & Electric Company, Evansville, Ind., died recently. He was 73 years old and the oldest employee of the company, having been with the corporation for more than 57 years. His first position with the company was "lead boy" for the horses and mules which pulled the cars a half century ago.

James G. Balfour, for many years a director of the Union Traction Company, an underlier of the Philadelphia Rapid Transit Company, Philadelphia, Pa., died on Aug. 7. Mr. Balfour was a former memmer of the Philadelphia Stock Exchange. He was 57 years old.

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Central and the New Haven cars, which are to be respectively 73 ft. in length, the new units will have a standard length of 60 ft. The gasoline engines, which are of a design developed by the Brill automotive engineering section, are being made at the South Philadelphia Works of the Westinghouse Electric & Manufacturing Company. Upon completion, the motive equipment, both gasoline and electrical, is being shipped to the Brill Works, where the construction of the cars is meanwhile being rushed to completion.

60 New Electric Units Ready for Service on Long Island Railroad

PART of a $2,902,286 car order announced in the JOURNAL for Feb. 12 for the Long Island Railroad, New York City, is now being delivered. It consists of 60 motor, passenger, suburban, double-end cars. The units, of all-steel construction and embodying every modern device, are being delivered by the American Car & Foundry Company, Berwick, Pa.

They are equipped with Westinghouse No. 308G-1 inside hung motors. Each coach has an over-all length of 64 ft. 5¾ in. and a seating capacity of 78 passengers. Total weight of each unit is 114,700 lb. Commonwealth cast-steel trucks are on all the units. The painting scheme is the standard red color of the company. In general design, the new rolling stock is the same as that which was fully described in the JOURNAL for Feb. 2, 1924.

According to an announcement by George Le Boutillier, vice-president of the road, made in ELECTRIC RAILWAY JOURNAL Feb. 12, the Long Island will have 100 per cent steel equipment both on its electric and steam divisions by the end of 1927. The company's expenditure in order to eliminate the wooden type car from its rolling stock represents an outlay of $5,000,000.

Detailed in Mr. Le Boutillier's February statement was the placing of an order for 127 steel passenger cars, representing an investment of $2,114,188, which included 117 coaches and ten combination baggage and passenger cars. This was in addition to the $2,902,286 expenditure authorized in 1926 and which included, besides the 60 motor cars now being delivered, 30 trail cars for electric service and twenty coaches and four combination cars for steam service. All the units will be so constructed as to permit of conversion to electric operation. When all the orders are completed the Long Island will have a total of 1,411 steel passenger-carrying units.

Official specifications for the 60 motor cars, just announced by G. C. Bishop, superintendent of motive power, are as follows:

Number of units	60
Type of unit	Motor, passenger, suburban, double end, double truck
Number of seats	78
Builder of car body	American Car & Foundry Co.
City and state	Berwick, Pa.
Date of order	October, 1926
Date of delivery	May, 1927
Weights:	
Trucks—Motor	19,540 lb.
—Trailer	17,420 lb.
Total	114,700 lb.
Bolster centers	39 ft. 9 in.
Length over all	64 ft. 5¾ in.
Length over body posts	54 ft. 3¾ in.
Truck wheelbase—Motor	8 ft. 6 in.
—Trailer	7 ft. 4 in.
Width over all	9 ft. 10¼ in.
Height over all	13 ft. 8¾ in.
Window post spacing	34 in.
Body	All steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Motor truck 5½x10; trailer truck 5x9
Car signal system	Electropneumatic
Compressors	Westinghouse D3-F
Conduit	Metal
Control	Westinghouse electropneumatic
Couplers	Sharon special
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Door mechanism	National Pneumatic
Doors	Sliding
Finish	Paint
Floor covering	Monolith
Gears and pinions	Nuttall
Glass	Non-shatterable at motorman's station; 3902 in carbody
Hand brakes	Lindstrom
Heat-insulating material	Salamander
Heaters	Gold Car Heating Company, electric
Headlights	Electric Service Supplies Company
Headlining	Steel
Interior trim	Steel
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	GE No. 50746
Motors	Two Westinghouse No. 308G-1, inside hung
Painting scheme	Red
Roof material	Steel
Sash fixtures	National Lock Washer
Seats	Heywood-Wakefield
Seat spacing	31½ in.
Seating material	Cane
Slack adjusters	Westinghouse
Steps	Stationary
Step treads	Diamond pressed plate
Trucks	Commonwealth cast steel
Ventilators	Automatic
Wheels, type	Rolled steel, 36 in. diameter
Special devices	Automatic inductive train stop

General Electric Men Move Up Ladder

Burton L. Delack, assistant manager of the Schenectady works of the General Electric Company since Dec. 1, 1926, has been appointed acting manager. Mr. Delack fills the vacancy caused by the promotion of C. E. Eveleth, elected a vice-president on June 1 of this year.

Edward A. Wagner, formerly of the Fort Wayne works but since July, 1926, managing engineer in charge of all distribution transformers, with headquarters in Pittsfield, has been made acting manager of the Pittsfield works, succeeding Mr. Chesney, who has been vice-president in charge of manufacturing since the retirement of F. C. Pratt.

Giuseppe Faccioli, works engineer of the Pittsfield works, has been appointed associate manager and works engineer of the Pittsfield works, Mr. Chesney announced.

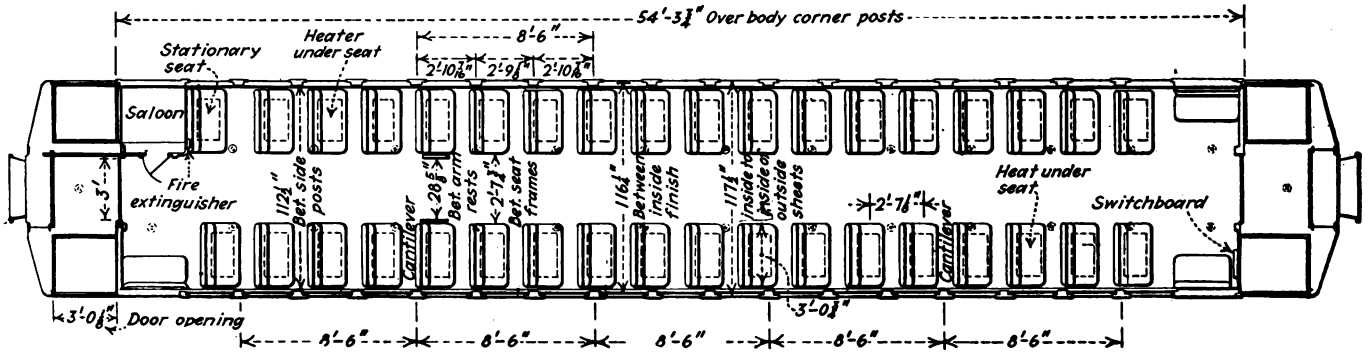
Ten Cars Ordered by Macon Railway & Light Company

Macon Railway & Light Company, Macon, Ga., has placed an order for ten cars with the Perley A. Thomas Car Works of High Point, N. C., for delivery in the fall. This order was forecasted in ELECTRIC RAILWAY JOURNAL for April 9, at which time the order was dependent upon action by the City Council on an increased fare petition.

Anchor Post Fence Company to Build Factory in Baltimore

The Anchor Post Fence Company of New York and Cleveland, manufacturer and erector of chain link and similar types of wire fences, gates and railings, has acquired control of a site in Baltimore for the erection of a new manufacturing plant. The site selected is in the eastern industrial section of the city, having direct rail connection, by means of the Canton Railroad, with both the Baltimore & Ohio and the Pennsylvania roads. It is within a short distance of the new plant of the Bethlehem Steel Company at Sparrows Point.

The first unit to be erected will be a one-story steel and concrete manufacturing and storage building, 200 ft. wide by 500 ft. in length. The building is to be equipped with an overhead traveling



Seating plan for 60 electric units now ready for service on the Long Island Railroad.

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crane, weaving looms, a continuous galvanizing unit and is to have every facility for the economical manufacture and handling of its products.

The company now operates plants at Cleveland, Ohio, and Garwood, N. J., and distributes its products through branch sales offices and agents throughout the country.

The Austin Company, Cleveland, is the general contractor. Building operations were started in June and the structure is scheduled for completion in the fall.

Copper, Lead and Zinc Prices Off

A reaction occurred during the week ended Aug. 10 from the activity and strength that have characterized the metal markets recently. The damage done has not been great, however, and with stronger London quotations the last two days of the week sentiment seems improved.

Most of the large producers have continued quoting 13⅜ cents delivered to usual Eastern points of consumption. A fair amount was sold on Aug. 4 and 5 at these prices, but later this quotation has become almost entirely nominal. Following the recent good buying, and in view of the pronounced drop in London on Aug. 8, most consumers became disinterested, and prices as low as 13.20 to 13.25 cents, delivered Valley, were necessary to tempt some of them. Such quotations were not general and some copper sold on Aug. 10 as high as 13½ cents in the Middle West. The export association has continued its 13.65 cents c.i.f. price, but foreign buying has been as quiet as domestic.

The only change in the lead situation is a slight softening of the price in the St. Louis district, where some metal is obtainable at 6.475 cents, or possibly 6.45 cents. The American Smelting & Refining Company has maintained its official contract price for New York lead at the 6.75 cent level established during the week ended Aug. 3. In some instances a slight premium has been obtained, and on the other hand the price has been shaded by dealers yesterday and today. In the Middle West the leading interest has been at 6.55 cents most of the week, although 6.50 cents has been quoted to regular customers to meet the "outside" market.

Though the price of zinc has reacted from the high of 6.45 cents of a week ago, selling for as low as 6.30 cents, St. Louis, in the week ended Aug. 10, a slightly firmer tendency is now noted, with most producers quoting 6⅜ cents.

Tin eased in both the foreign and domestic markets on Monday, but closed the week with Straits in New York slightly higher than during the previous week. The premium of Straits over 99 per cent is narrower than it was a month ago, because the lower-grade metal is not so plentiful for prompt delivery as it had been. October delivery is quoted at only about ¼ cent under prompt.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Aug. 9, 1927
Copper, electrolytic, cents per lb.	13.05
Copper wire, cents per lb.	14.75
Lead, cents per lb.	6.75
Zinc, cents per lb.	6.325
Tin, Straits, cents per lb.	65.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.025
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings, Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	14.00
Turpentine (bbl. lots), N. Y., per gal.	$0.63

P. O. Reyneau Joins Cutter Company

Paul O. Reyneau has affiliated himself with the Cutter Electrical & Manufacturing Company of Philadelphia, Pa. For the past 3½ years he has been consulting engineer for the American Gas Company, Philadelphia, remaining with that organization until its recent merger with the United Gas Improvement Company.

Mr. Reyneau's first electrical work was an an employee of the Telluride Power Company. He then continued his technical education at Cornell University, from which institution he was graduated in 1913. Immediately after graduation he became identified with the overhead lines department of the Detroit Edison Company, subsequently serving as distribution engineer and still later as assistant electrical engineer, holding the last named position until his resignation to become affiliated with the Philadelphia Electric Company in charge of transmission and distribution design. It was in 1923 that he joined the American Gas Company.

?

A Clam's a Chatterbox

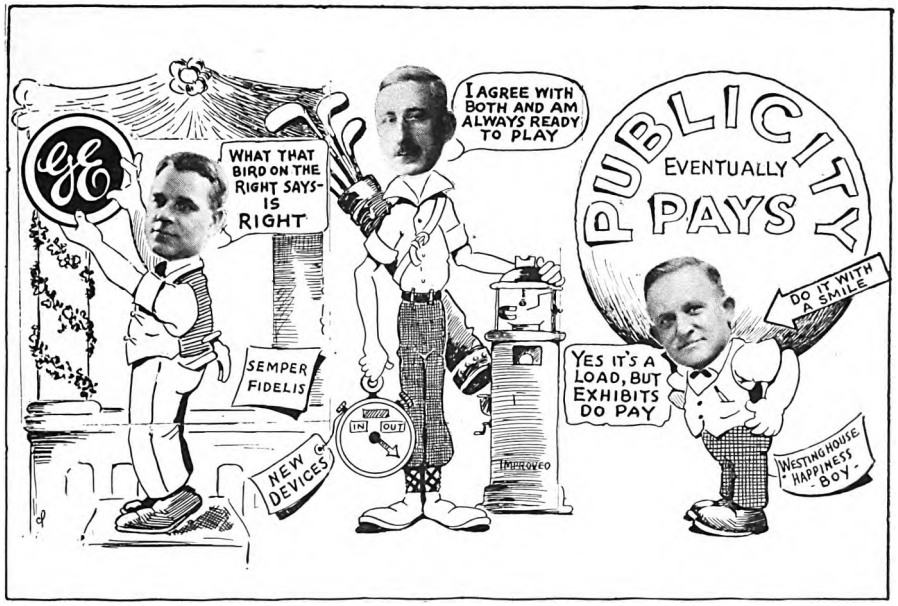
Just now compared with those who are going to spill the sensation about decorations for the

Big Show at Cleveland

When the announcement is made it is going to be a lulu.

Prepare Yourself for a Jolt!

EXHIBITOGRAPHS—No. 3



Tank Car Company Merger Denied

Denial has been made by F. N. Hoffstott, president of Pressed Steel Car Company, of the reported impending merger of his company with the General American Tank Car Company. According to Mr. Hoffstott no proposition for a merger between the companies has been put up to the directors or stockholders of Pressed Steel Car.

Electric Locomotives Delivered to South Shore

Two new 57-ton electric freight locomotives recently purchased by the South Shore Line from the Westinghouse Electric & Manufacturing Company were recently delivered and are now in regular service. These locomotives are of a lighter type than others owned by the company and are to be used in switching and work train service, replacing others for use in the rapidly increasing freight service.

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Cotton Shortage Sends Electrical Supplies Up 5 Cents

By Robert E. Dunne
Mitchell-Rand Manufacturing Company, New York City

FOR some time a number of textile mills catering to the electrical trade have been prosperous without profit. That is, they have been running on fairly large quantities of material, but at prices that did not compensate them for their investment of capital, labor and material. This condition could not endure forever and already several producers have withdrawn the extremely low prices made during the latter part of 1926 and early 1927.

Competition has been so keen that no one dared take the initiative in advancing prices until a universal reason presented itself. Encouraged by the reported cotton crop, which will be considerably less than last year, due partly to the reduction of available cotton acreage in the flooded Mississippi Valley and an increased consumption, prices have advanced from 12 cents to 18 cents per pound.

This is not a startling condition, but the purchaser must pay a higher price for cotton products during the second half of 1927 then he did during the first half, as supplies of the low-priced cotton of late 1926 and early 1927 are now exhausted and prices of finished products will be figured on the higher price for raw cotton.

Another factor, which is probably more indicative of a stronger market and higher prices than the measuring of the cotton crop of last year against the estimated crop of this year, is the astounding increase in consumption and the quantities of unfilled orders on hand in the general textile field.

In the *Cotton Textile Bulletin* the substended compilation appears:

Six Months Statistics Show Large Sales of Cotton Goods

Statistics for June and consolidated reports for the first six months of the year covering the production and sales of more than 200 classifications of standard cotton cloths, as compiled by the association for 1926 and 1927 are summarized below (000's of yards omitted) as follows:

When the mills have so large a quantity of unfilled orders on hand, and when the reported cotton crop is less than the previous year one cannot expect any recession of price, but must expect a slightly higher price level than is existent, especially as many mills have been taking business that has been unprofitable.

The conditions outlined above refer to the general textile field, of which the demands of the electrical industry are but a small part, but that part of the cotton industry applying to the electrical trade must move with the whole.

	June		Change in Per Cent from 1926	Six Months		Change in Per Cent from 1926
	1926	1927		1926	1927	
Production	225,807	279,456	+23.7	1,321,052	1,487,387	+12.6
Sales	172,149	179,060	+ 4.0	1,209,891	1,703,401	+40.8
Ratio of sales to production, per cent	76.2	64.1	....	91.6	114.5	
Shipments	202,661	269,723	+33.1	1,281,291	1,546,998	+20.7
Ratio of shipments to production, per cent	89.7	96.5	....	97.0	104.0	
Stocks on hand						
First of period	286,920	177,890	—38.0	268,716	247,234	— 8.0
June 30	310,825	187,623	—39.6	310,825	187,623	—39.6
Change in stock, per cent	+8.3	+5.5	....	+15.7	—24.1	
Unfilled orders						
First of period	217,850	572,009	+162.6	261,317	324,943	+24.3
June 30 were	182,708	481,346	+163.4	182,708	481,346	+163.4
Change in unfilled orders, per cent	—6.1	—15.8	....	—30.1	+48.1	

ROLLING STOCK

Kansas City, Leavenworth & Western Railway, Kansas City, Kan., has placed an order for four combination passenger, baggage and lounge cars with the American Car Company, St. Louis, Mo.

Carolina Power & Light Company, Raleigh, N. C., has ordered four special safety motor bodies on Brill 79-E-2 trucks from the J. G. Brill Company, Philadelphia.

Capital District Transportation Company, bus operating subsidiary of the United Traction Company, Albany, N. Y., has received twenty Mack city type, gas-electric drive, 233-in. wheelbase buses. These buses have six-cylinder motors, General Electric generators and single electric motors. Seating capacity of each bus is 29 passengers. This delivery brings the Mack fleet of this operator up to 50 gas-electric buses in service in Albany, Troy and Rensselaer.

Sioux Falls Traction System, Sioux Falls, S.D., has purchased two additional model 53 White buses. This line now has a White bus fleet of thirteen.

Northern Texas Traction Company, Fort Worth, Tex., will supplement its street car service in Fort Worth with five new 21-passenger motor buses, A. J. Rowe, assistant manager of the company, announces. Four buses of this kind already are in operation in this city.

St. Louis Bus Company, bus operating subsidiary of United Railways, St. Louis, Mo., has accepted delivery of two White buses, model 53, bringing the number of White buses used in coordinated service by this system in St. Louis to 36.

TRACK AND LINE

International Railway, Buffalo, N. Y., has notified the City Council that it will proceed with track reconstruction and paving on Fillmore Avenue as soon as the necessary materials are delivered about Aug. 15. The company announces that during the balance of the current year it will spend $250,000 on track reconstruction and paving on streets approved by the municipal authorities. This is $100,000 more than the expected additional revenue from the 10-cent fare authorized by the Public Service Commission during the same period.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has placed new street car tracks on the south side of Alabama Avenue from Lake Avenue to Carnegie Avenue, for use of the Hyde Park cars. The track on the north side of Alabama Avenue formerly used by these cars, will be removed.

TRADE NOTES

Lincoln Electric Company, Cleveland, Ohio, announces that the Missouri district office has been moved from 1808 Railway Exchange Building, St. Louis, to 1003 Davidson Building, Kansas City, Mo. Robert Notvest is in charge. The St. Louis district will be handled by Mr. Notvest also, his time being divided between the two cities. A branch has been established at 220 Nicholas Building, Toledo, Ohio, A. H. Homrighaus, formerly in charge of the Missouri District, being in charge of this district.

Bridgeport Brass Company, Bridgeport, Conn., announces the appointment of William S. Kriebel, Jr., Philadelphia, as salesman of Bridgeport Brass products in the Philadelphia territory. He will make his headquarters at the Bridgeport Brass Company's Philadelphia office, located in the Bankers Trust Building.

Waukesha Motor Company, Waukesha, Wis., manufacturer of heavy-duty Ricardo Head industrial and vehicle engines, has opened its new Eastern sales office at 8 West 40th Street, New York City. The New York office was formerly in the Aeolian Building, 33 W. 42d Street, New York City.

ADVERTISING LITERATURE

National Paving Brick Manufacturers Association, Chicago, in its July, 1927, issue of "Dependable Highways" tells of the merits of using brick for paving the street car track area.

Crouse-Hinds Company, Syracuse, N. Y., has recently issued bulletin No. G-2 on groundulets and other safety circuit devices, bulletin No. 308 on floodlight projectors, folder No. 51 describing the new Obround condulet, and bulletin No. 2098 on self-threading unions and connectors.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, August 20, 1927 *Number 8*

He Raised the Standards of American Business

THE passing of Elbert H. Gary, chairman of the board of the United States Steel Corporation, has brought a flood of eulogistic messages from civic and business leaders throughout the civilized world. As the master mind and personality behind the largest industrial organization in the country, his business judgment and organization genius were universally recognized. But his death has thrown into sharp relief phases of his life and accomplishments not so generally known. In the words of President Coolidge, expressed in a message of sympathy to Mrs. Gary, "He stood foremost among those who find in the great private enterprises of our country an opportunity for public service as well as a medium for financial profit."

Business and industrial leaders throughout the country caught the same note in interpreting the outstanding accomplishments of the man. "He did most to restore conscience to business." "He was more than a captain of industry, he was a statesman of industry." "He led in the great movement to elevate industry to its present high plane of business and social morality and justice." "He stood for fair competition—he was the statesman of business." "He will be remembered as the outstanding man who conceived the idea of competitive co-operation rather than competitive strife in industry." In short, his greatest accomplishment was not that he conceived, organized and managed successfully the largest industrial enterprise in the country, but that he used the opportunity and the power that these immense resources gave him to raise the standards of American business. He used private enterprise as the means of rendering a public service.

There is an inspiration to all business in these interpretations of Judge Gary's life and accomplishments. This is particularly true of the utility business. Here we are engaged directly in a public service through private enterprise. This business is built on the foundation principle of combining private initiative and efficiency with the public interest. In that respect American utilities as a whole are unique among those of the world. Therein lies the secret of their marvelous development and efficiency. Private initiative and driving power have far outstripped the cumbersomeness and inertia of bureaucracy applied to the management of utilities.

Judge Gary saw the opportunity for public service in what to many would appear to have been purely a private enterprise. He not only conceived the idea, but he applied it. Then he exposed his handiwork to the pitiless spotlight of publicity. Through that he won the public confidence. He demonstrated that size and power in an industrial organization are not necessarily inimical to the public interest. In fact, he proved that it is entirely possible to direct such immense private forces as an active champion of the public welfare. And he proved likewise that unswerving adherence to such a policy is good business. It is upon the ability of its leaders to maintain "The Public Service" clean and untarnished on the escutcheons of the utility industry that the future progress and welfare of that business depends.

Getting the Most Out of Scrap Material

EFFICIENT handling and disposal of scrap material from electric railways have been long neglected. Only during the last few years has the disposition of such material been conducted along effective lines in a systematic manner. The scrap pile has been one of the greatest sources of waste in railway shops. In many places all parts, regardless of the material of which they are constructed, which had outlived a period of usefulness were thrown indiscriminately into ungainly heaps. No attempt was made to discover any additional value that might be left or to grade the material so as to obtain a higher price for it as scrap. That the various parts were worn out and no longer useful for the original purpose settled the matter. All was considered scrap, just so much waste that must be disposed of.

A scrap pile is never a thing of beauty. Nothing about it adds to the orderly appearance of the yard. These heaps of dead material take up space which could be used for more profitable purposes. When the space is required it is felt that the scrap must be removed as quickly as possible. This condition always made the junk business profitable. Railways that were continually having accumulations of waste matter were approached by dealers in junk, and for a nominal price they got all of it that they could handle. The junkman made the terms and the railway was satisfied if the piles were removed as quickly as possible. In these piles of iron and steel parts everything was considered as iron and bought by the dealers as such. On some properties accumulations amounted to as much as twenty tons a week. If this were sold at $3 per ton, or $3,120 a year, the company felt quite satisfied.

The more progressive properties, however, have realized that there is a considerable demand at the rolling mills for scrap iron and steel, so that now they not only sort the different materials but also place the several grades of steel in different piles, and each is sold at a price more nearly proportionate to its real value. Often the junkman has been done away with entirely, the purchasing department dealing directly with the steel mills. Non-ferrous metals, such as copper and brass, are also graded and sold to neighboring brass foundries. This

This is the issue in August that is devoted essentially to maintenance and construction subjects

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method has not only increased the income of the railways but it has also improved the appearance of the property, as the materials are kept in neater condition and can be disposed of at such frequent intervals that large accumulations never occur.

Perfection Can Be the Goal

NO LESS an authority than Michelangelo is responsible for the famous axiom "Trifles make perfection and perfection is no trifle." The thought comes to mind immediately when one ponders the performance of the emergency division of the United Railways & Electric Company of Baltimore, which recently celebrated in recognition of having gone 58 consecutive days without a trolley wire break. This performance is in itself remarkable in a city the size of Baltimore, with intensive car service on many streets. It is still more remarkable in view of the reduction in the number of breaks from 1,321 in 1918 to fifteen for the first seven months of this year.

With a record such as this, the term "emergency division" is something of a misnomer, as General Manager H. B. Potter pointed out at the dinner. The result was brought about only by a most thorough study of the mechanics of the trolley pole, the trolley wheel, the wire and its supporting structure, followed by vigilant supervision and unceasing inspection of the overhead work.

Undoubtedly the cost of this careful method may be greater than when the wire is allowed to go until a break occurs, and then only to make the repair which has become necessary through failure. But the report of the failure is invariably made on account of delay occasioned to one of the revenue cars in service, and the resultant difficulty of operation, if movement of cars is at all possible, will cause losses of revenue far greater than any saving that may be made by reducing the emergency force and eliminating the careful supervision necessary.

Nothing has been done in Baltimore that cannot be repeated elsewhere. Every railway has the same possibilities for giving 100 per cent service. While the weather is more moderate in Baltimore than in some Northern cities, it is only a question of selecting the correct type of construction and the proper materials for the climate and service. Here is one instance where the way has been shown to perfection, and perfection alone is the goal.

Get Your Luncheon Tickets Early

ANNOUNCEMENTS made by Chairman H. L. Brown for the committee having in hand the program of the coming Cleveland convention arouse unusual interest and anticipation regarding this annual "get-together" of the local transportation industry. There is in the plan of the program a promise of all those elements which should make it of maximum inspiration and practical value.

An unusual feature is the series of informal luncheon conferences planned for Tuesday, Wednesday and Thursday. There will be no formal addresses at these meetings. The time will be devoted entirely to "across-the-table discussion." A subject will be designated for each luncheon and a sponsor will be named to start and direct the discussion. Attendance at each of these meetings will be limited to 50, so as to insure informality. The purpose is to permit executives, by selecting one luncheon each day from a number being held simultaneously, to take part in a meeting devoted to that subject in which they are at the moment most interested.

Obviously it is impossible during the limited period of a convention to give adequate consideration to the many topics of interest to the transportation executive. By this plan of permitting selection of subjects, it was the purpose of the committee to cover the entire range, but to permit each executive himself to select the subject to which he wished to devote the limited time available.

This arrangement respresents a considerable departure from previous electric railway conventions. The committee is to be commended for its enterprise in thus making a distinct effort to increase the practical value of the program. The success of the scheme will depend upon two major factors: First, the co-operation extended by the executives of the industry in making their luncheon selections early so as to permit advance arrangements to be made; the second condition for success is that executives catch the spirit of these meetings and use them for the purpose for which they are intended—the frank interchange of operating experience.

Training Supervisors Is the First Step

NEED exists for more thorough training of men in supervisory positions. It is well that the electric railway industry is awake to this need, as the rank and file must be reached through these officials. It seems almost trite to say that they occupy a strategic position between men and management, that they are the key men of the industry in employee relations. It's true though trite. A good indication of the interest in the foreman-training movement was the way in which the demonstration conference, staged at Cleveland last October, was received by the large gathering of representative executives. The men who attended had a demonstration which convinced them that the conference plan wins interest and stimulates discussion of the practical, every-day problems of foremanship. There was ample evidence that supervisors can be interested in studying the principles of successful supervision. It was shown that men naturally reticent will discuss vital subjects freely when there are no "higher ups" present.

Having succeeded through several years of effort in awakening an interest in foreman training throughout the industry, the American Association committee on education, under the leadership of its chairman, Edward Dana, general manager Boston Elevated Railway, has undertaken to assist electric railway managers to put on foreman training next season if they so desire. The committee plans to hold during convention week a series of conferences at Cleveland to help train conference leaders. This will in part answer the question: Where can we get men to lead these foremen conferences if we desire to hold them? It will prove an excellent investment for any railway to send a man or two to take this training course, for which there will be no fee to the railway companies. Enrollments are desired promptly, however, as the group must be limited in size, and as correspondence will be conducted during the summer.

Promising as is this plan, a word of warning seems appropriate in connection with the enterprise. Fully equipped foreman-conference leaders cannot be produced in a series of six four-hour conferences. Thus too much must not be expected of the instructors or the participants. A great deal can be accomplished, however, and the program is sufficiently ample to warrant active support of the committee's plan.

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Making a Science of Car Replacement

WITH all that has been said on the subject of car replacement and the forceful arguments that have been presented in favor of retiring obsolete rolling stock, skepticism has remained in the minds of some managements as to the financial advantages to be gained by the procedure. Certainly there is no need for scrapping equipment that can give service if it is replaced by other equipment that will not earn more, either in greater revenue, lower expenses or improved good will.

Many of the arguments for new cars have been general, and it has remained for the individual management to reason from these premises to the particular conclusions at hand. This has not always been easy on account of the many variables that enter. H. S. Williams of Detroit has reduced the effect of these variables to a formula which he has presented in an article published in this week's issue. Of course, judgment is necessary in placing the figures into the formula. These figures will vary on different properties, but since nearly all of them are capable of very close estimation, there need be little guesswork in the calculation.

Mr. Williams' formula takes into consideration those factors which are readily capable of accurate determination. There are several other intangible elements, in general favorable to the new cars in comparison with the old, which have not been given consideration. One of these is the reduced accident hazard, due to low floors, better design of entrance and exit and automatic features of door control. Again, in the formula the same cost per ton-mile is assumed for maintenance. It is common knowledge that new equipment costs less to maintain than the car which has been in active service many years.

No allowance has been made in the formula for changes which may be advantageous to the other departments concerned in operation. For instance, the purchase of new cars makes possible more efficient handling of passengers. Again, the comparison is made only between one-man cars or between two-man cars. The purchase of new cars may be made the occasion for changing the method of operation, or the means of selling public and employees the advantages of one-man cars. These are incidental advantages of new cars, but some of them are of major importance, though not easy of calculation.

An analysis of the figures used by Mr. Williams as an illustration in his discussion shows that the most important factors are car weight, seating capacity and schedule speed. Since it is in these factors that the new types of cars excel the old, it is evident that it is not difficult to prove that the usual type of obsolete car is losing money in comparison with the performance of the models which are being offered today.

The Exhibits Are Essentially for Maintenance Men

SOMETHING of interest will be presented for every one at the annual convention of the American Electric Railway Association, but the exhibits are of prime interest to maintenance men. The attendance last year was marked particularly by the large number of foremen who were present. Cleveland, Ohio, the location this year, is the same and, no doubt, the maintenance forces again will be well represented. Each will get value from the exhibits in his own way and in proportion to his capacity to study the material shown. Five minutes devoted to inspection of a particular tool will result in a better understanding of its construction, merits and faults than several hours study of a catalog description.

General managers will do well to send as many men from their maintenance forces to the convention as possible, and the men themselves should study the equipment shown with a view to improving their own methods. Last year one railway sent a large delegation from the maintenance departments, and in addition to attending the convention from opening to finish, the week following was spent in visits to other railway properties that were on the route home. These men obtained much that has since proved of value to their railway.

The Interests of Omaha and Its Railway Are Mutual

OMAHA has finally got around to the point of considering seriously again the question of granting a franchise to the Omaha & Council Bluffs Street Railway. It is not all going to be plain sailing. That is apparent. There will be many chances for honest differences of opinion to arise during the negotiations. One thing is certain. The city will gain nothing if it attempts to hamstring its railway. President Hamilton has already made plain that under the tentative draft presented for discussion it would be impossible to do the refinancing that is imperative. If that be true, then it is enough to temper the attitude of the city officers with reason.

It would be fruitless to carry the negotiations any farther except that such discussions may tend to clarify the issue and verify what Mr. Hamilton says. The city has means at hand to substantiate his statement. The experience of the past is all available to it. The matter has not yet gone far enough for the commentator to offer specific criticism, but one thing does stand out. Danger to cities in the past has not lain in dealing too liberally with their railways, but in being too parsimonious with them. It is always possible to correct the defects of liberality, but the consequences of a niggardly policy are too grave to be eradicated readily. The purpose of the city is to secure adequate transportation. The desire of the company is to give adequate transportation. The issue transcends in importance and in consequence the narrow view that the advantage in negotiations may temporarily be with the city.

President Hamilton has done well to make his position clear at the outset. It is not so much the doing of a thing like this that matters, but rather the manner of the doing of it. It is no fault of the present company that the conditions in Omaha do not begin to approach the ideals which the management has in mind. Those ideals can be realized only as the city is disposed to deal liberally with its street railway, for after all in dealing with the railway it is in the last anlaysis dealing with its citizens. The city and the company will proceed toward a satisfactory conclusion only as they thoroughly understand each other. If the experience of the past really means anything to Omaha, then those responsible for the attitude that the city takes will approach the coming franchise discussion not in a spirit of barter but in one of mutual helpfulness. The reiteration of these things makes them sound trite, but there is no escape from the consequences of their implication. That is proved by history.

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Details of

Shop and Equipment

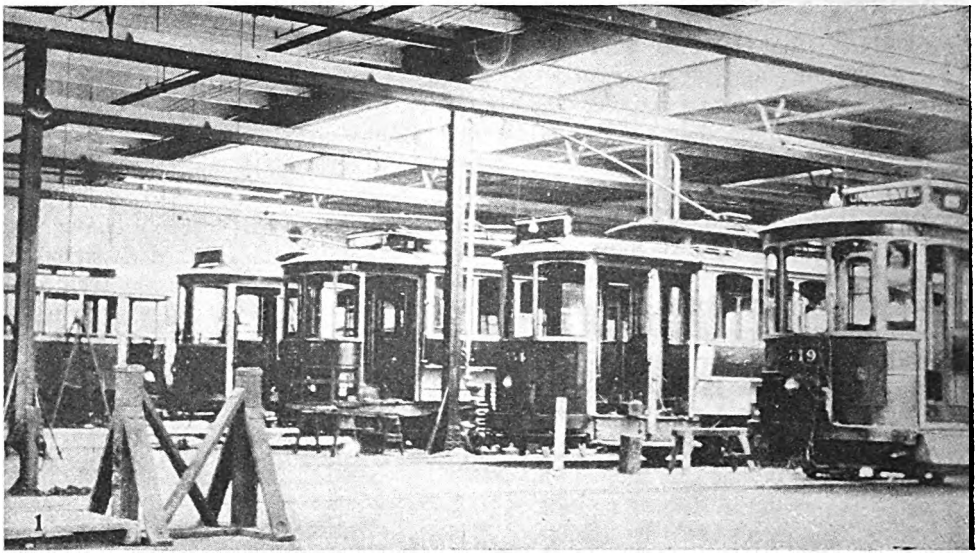
Used by

Portland Electric Power Company

to

Modernize

Its Cars



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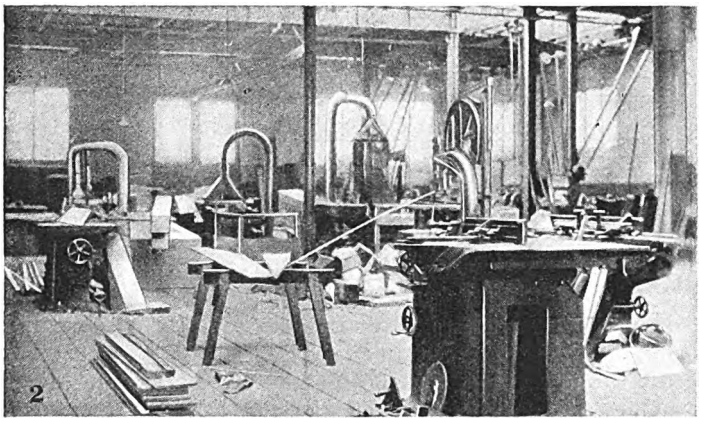
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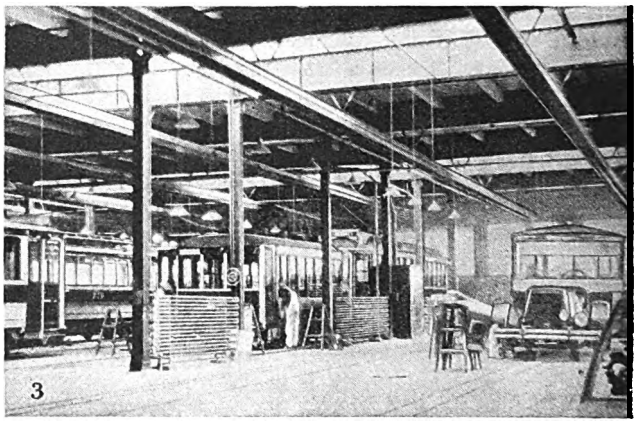
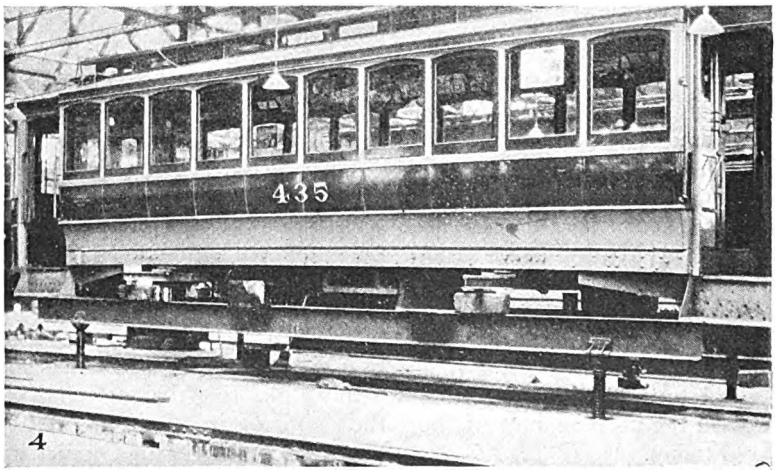

3

No. 1. The carpenter shop is light and airy and all repair work is done by electrically driven hand tools.

No. 2. The machines in the wood mill are driven by counter shafting mounted under the floor.

No. 3 In addition to car painting the company also paints its buses and does similar work for the track, roadway and equipment departments.

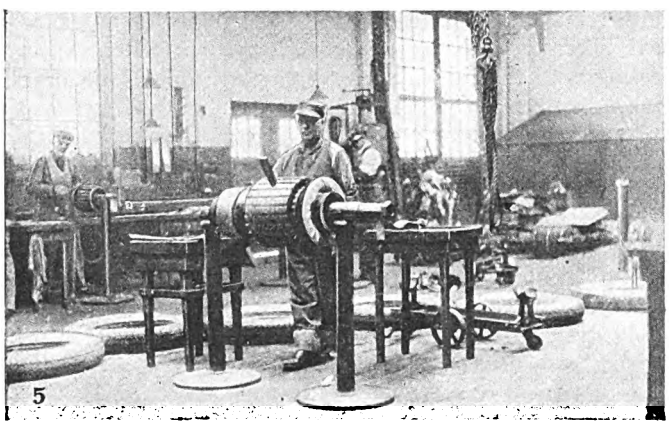


4

No. 4. Car bodies, during repairs, are supported on rail hoists operated electrically by screw jacks.

No. 5. Modern armature winding stands, dipping pans and bakeovens are included in the equipment of the armature room.

No. 6. Shelves and bins are located conveniently along the walls of the motor repair section.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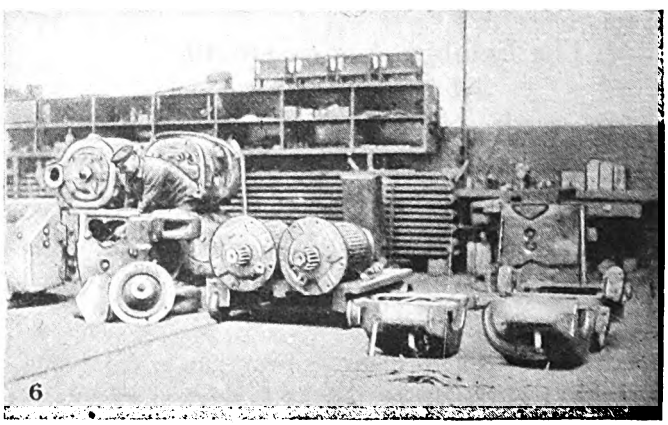
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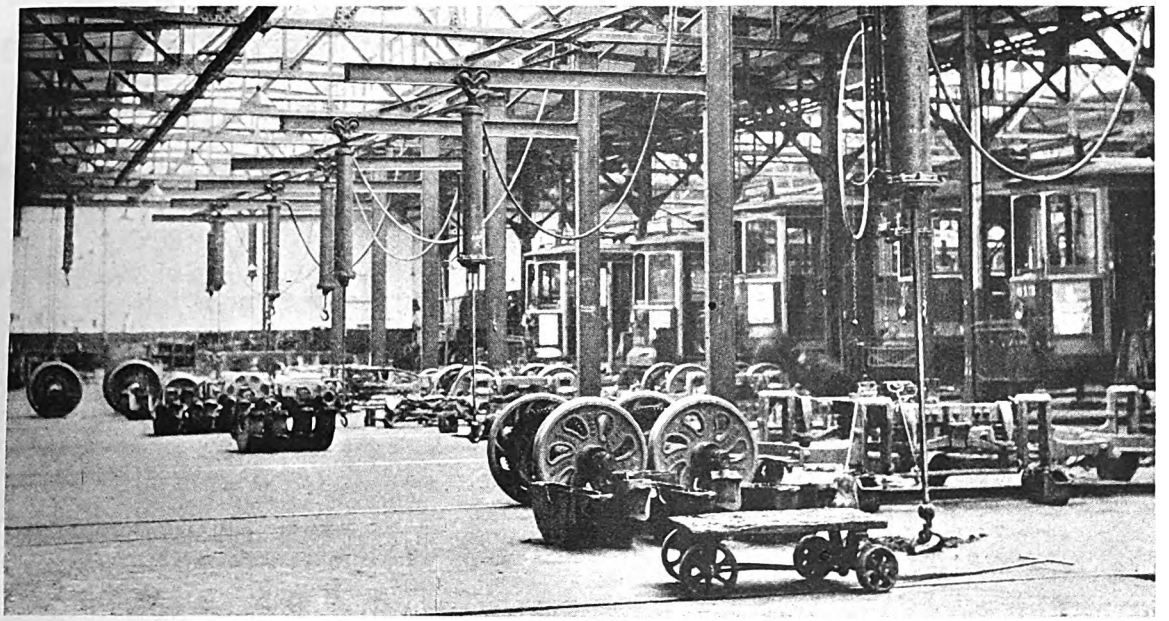


Air hoists on jib cranes are used extensively in the shop repair department

Cars Modernized

in Improved Shops

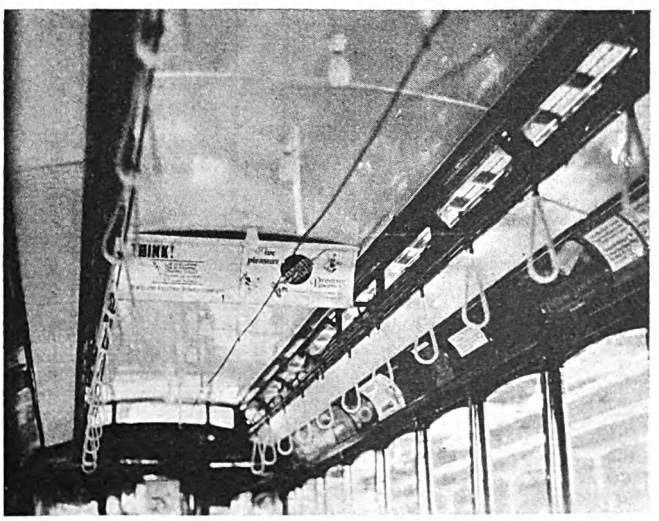
MODERNIZATION of the narrow gage equipment of the Portland Electric Power Company, Portland, Ore., has shown its effect in improvement in appearance of the car interiors and bright-colored, well-kept paint on the exteriors. Most of the cars on this property date back to 1912, but they have been kept in good operating condition by an efficient shop department.

Recent changes made in the cars to render them more attractive include the installation of white celluloid covered hand straps, frosted 60-watt ceiling lamps and white enameled ceilings, both in the upper and lower monitor decks. These improvements have aided in bettering illumination and making the car more cheerful.

A vestibule lamp, controlled by the position of the forward folding door, lights up the entrance and exit steps when the door is open. Many of the cars have been remodeled for one-man operation and in the reconstruction the sliding bulkhead doors were left open and the motorman shielded by a curtain sliding on a horizontal rod. The car exteriors are painted in maroon and cream. Each car is passed through the overhauling shop every eight months, at which time it is given a coat of paint. The under-rigging and operating mechanism are kept in first-class operating condition by frequent inspection. Some experiments are being conducted with cross seats in this type of car, but for the most part the equipment has longitudinal side seats with rattan upholstery.

In the truck repair department air hoists on jib cranes are used extensively for lifting motors from the trucks, lifting out wheels and handling other heavy work. There is plenty of light and ventilation from the monitor type skylights which are constructed over each bay of the building. Accommodations are provided for approximately twenty cars over shallow pits in the repair section of the shop.

The carpenter shop is as light and airy as the other sections of the building. The cars are run in on tracks without pits and the necessary body repair work is done by electrically driven hand tools. One section of the body repair shop is devoted to painting. In this section the buses are painted



Rolling stock has been improved through the installation of frosted lamps, a white enameled ceiling and celluloid handles on hand straps

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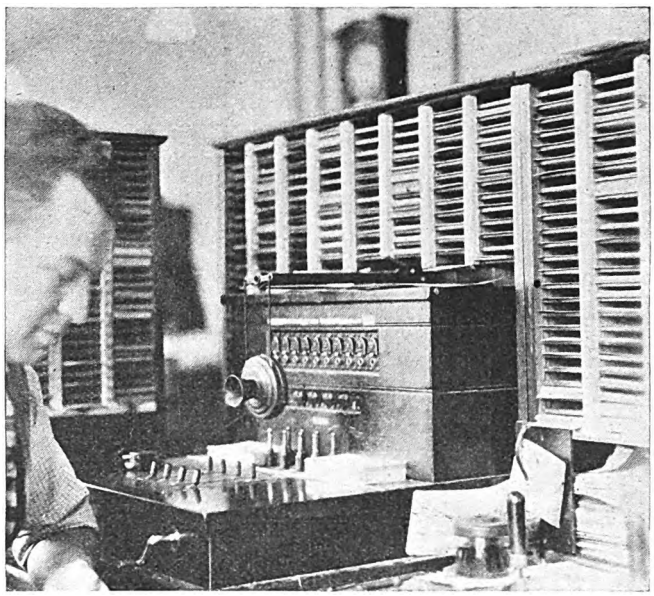


The timekeeper has a complete record of jobs which are being done in the shop

and other paint work is done on materials for the track, roadway and equipment departments.

Where it becomes necessary to work on the car body when the trucks are removed, the body is supported by electrically operated car hoists, which support the body on I-beams so that work on the bolsters and underframing may be done by men working in the pits.

A small mill is adjacent to the body repair shop. All of the equipment in the mill is individually driven by belting from countershafts installed under the floor. This equipment consists of joiners, planers, band saws, mortisers and other wood-working equipment, with which it is possible to turn out all shapes and members for body replacement work and also to build complete car bodies if necessary.

All armature repair work is done by two winders and as many helpers in the section of the building between the shop offices and the machine shops. Modern stands, dipping vats and bake ovens are part of the equipment of this department. Motor repair work and dismantling of electrical equipment are done in a section of the truck repair department. To keep this section clean, shelves or bins mounted along the wall hold the tools and small parts necessary for the somewhat dirty work of motor repairs. One man and a helper do this phase of overhauling.

Each piece of shop repair work is handled as a job order and is timed by a timekeeper in the shop office. Foremen of the various shop departments report completion of a job to the timekeeper, who then calculates and enters on a card the item of time and costs. The time is computed by a timekeeping machine. Through the use of this method workmen are not idle at any time and the office knows the progress of the work, not only as a whole but for any particular job.

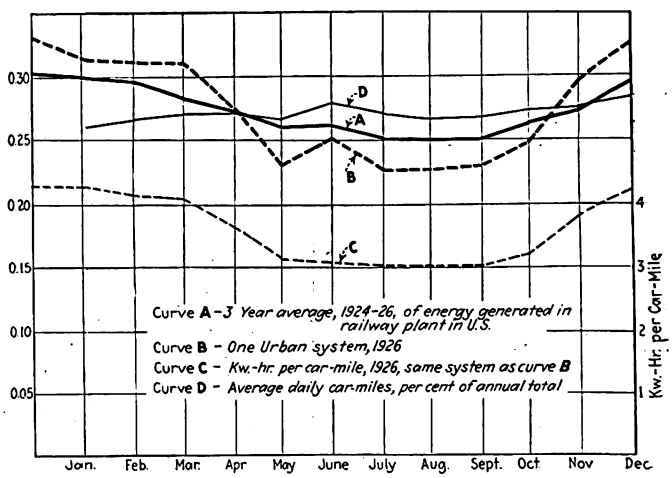
Energy Used for Traction Steadily Increases

Popularity of street car revealed by steady increase in electricity used for traction purposes

ONE of the greatest proofs of the increasing popularity of the street car is revealed by an analysis of the energy consumed for traction purposes during the six-year period 1920 to 1926. In spite of the use of buses, advent of one-man cars, lighter rolling stock, better motors and scientific instruction of operators as to the conservation of energy—all of which at first blush would argue against increased consumption—the analysis conducted by the ELECTRIC RAILWAY JOURNAL, in co-operation with and through the courtesy of G. F. Wittig, statistical editor of *Electrical World*, shows such a steady increase in energy consumed as to warrant, in the opinion of the editors, a résumé of the situation beginning with the year 1920. In order to watch this interesting commentary on car popularity, the chart entitled "Monthly Consumption of Energy for Electric Railway Companies," appearing with this article, will be a regular feature of the JOURNAL in the issue nearest the first of the month.

That the traction companies are calling for more electricity for transportation purposes is revealed in a 25.7 per cent increase in electrical energy consumption for this purpose in the six-year period 1920 to 1926. By far the larger portion of the increase was found by Mr. Wittig to be in the energy purchased from central-station companies, which grew from 4,820,000,000 kw.-hr. in 1920 to 6,599,000,000 kw.-hr. in 1926, or nearly 37 per cent, while the amount generated in the railway company plants increased by only 12 per cent, from 3,903,000,000 to 4,370,000,000.

In determining these figures, data for the years 1920



Average daily railway energy consumption in per cent of annual total

MONTHLY ENERGY CONSUMPTION FOR RAILWAY OPERATION IN THE UNITED STATES

Month	Generated in Company Plants			Purchased			Total		
	1927	1926	Per Cent Increase	1927	1926	Per Cent Increase	1927	1926	Per Cent Increase
January	400	411	—2.7	623	614	+1.1	1023	1025	—0.2
February	350	387	—9.6	558	550	+1.4	908	937	—3.1
March	371	395	—0.5	585	577	+1.4	956	972	—1.6
April	345	352	—0.2	550	542	+1.5	895	894	+0.1

Compiled by G. F. Wittig, *Electrical World*.

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to 1922 inclusive are taken directly from statistics collected by the United States Geological Survey, while those for the last four years are taken from the same source with a small allowance for the amount of energy estimated to have been used for other than railway purposes. Estimates of the amount of energy purchased annually from central-station companies are those published by ELECTRICAL WORLD, based on returns from about 75 to 84 per cent of the electric light and power industry in various years.

For the year 1922 comparison of the figures here given with those published in the Census of Electric Railways shows some disagreement, especially in the figures for energy generated, where the Geological Survey and Census figures differ very materially.

The latter give 6,473,450,701 kw.-hr. generated and 5,931,601,934 kw.-hr. purchased. It is believed that the discrepancy is accounted for, in considerable part at least, by the inclusion by the Census of the output of certain companies serving a considerable railway load, but actually electric light and power companies.

In the chart showing the monthly energy consumption these have been allocated in accordance with ratios worked out from the Geological Survey figures.

The chart of monthly energy consumption shows pronounced seasonal peaks, with apparently erratic monthly fluctuations in addition. The latter entirely disappear, however, when the curve is replotted in terms of average daily energy consumption, expressed as a per cent of the annual total.

In curve A on the chart of average daily consumption each point is the average of the percentages obtained for that month for the years 1924, 1925 and 1926. The curve is based on the Geological Survey figures.

That the seasonal variation observed is due primarily to such influences as car heating and snow removal rather than to any important variation in car mileage is shown by comparison with the curves for a transportation system in a city where climatic influences are pronounced. It appears that while the number of car-miles increased almost steadily from January to December, the energy per car-mile varies along a remarkably smooth seasonal curve.

The seasonal variation for that system was greater than that for the country as a whole, because the latter is flattened out by the effect of loads in warmer parts of the country where the seasonal influence is less marked or negligible.

Thus far this year energy consumption is slightly below that for the corresponding months in 1926; during January and February the amount of energy generated in the railway company plants was appreciably less than in the preceding year; the purchased energy, on the other hand, shows a slight gain.

No conclusions can be drawn as to the amount of transportation represented by these figures. It may be that the figures have no other significance than that last winter was milder, on the whole, than the preceding one.

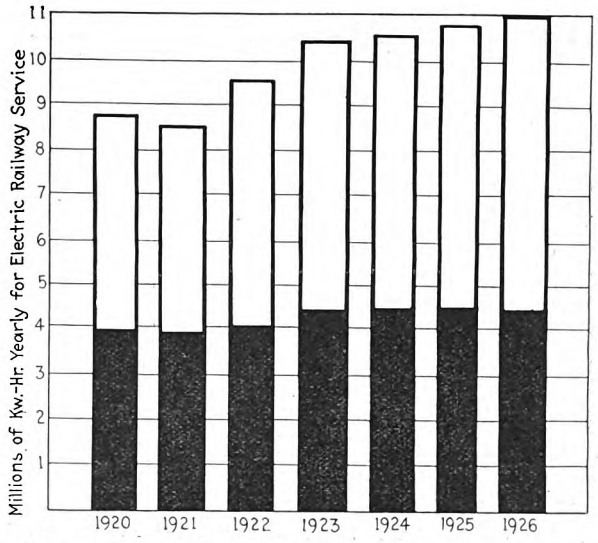
In view of the continuance of the same trend through May and June, as indicated by data secured after the chart was drawn, there has presumably been an actual increase in the amount of electric transportation provided. To what extent the increase has taken the form of main-line or suburban operation, by electricity, of railroads as distinguished from street railways, it is impossible to determine from data at present available.

ANNUAL ENERGY CONSUMPTION FOR RAILWAY OPERATION

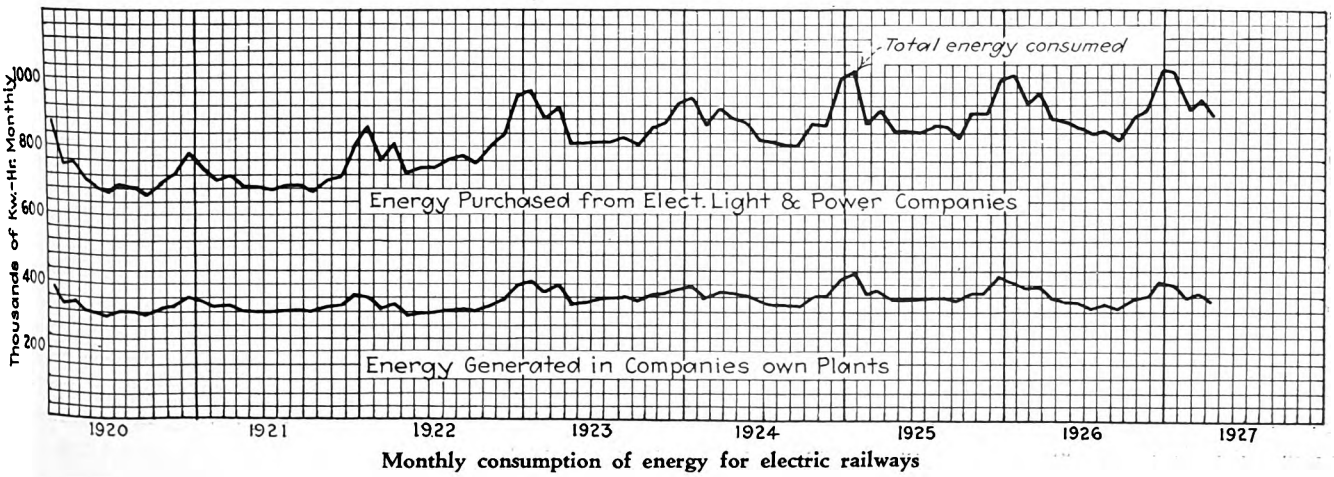
Year	Millions of Kilowatt-Hours Generated in Railway Company Plants*	Purchased from Central-Station Companies†	Total
1920	3,903	4,820	8,723
1921	3,883	4,600	8,483
1922	3,946	5,642	9,588
1923	4,364	6,000	10,364
1924	4,313	6,200	10,513
1925	4,452	6,301	10,753
1926	4,371	6,599	10,970
Per cent increase 1920–1926	12.0	36.9	25.7

* Based on U. S. Geological Survey data.
† *Electrical World* estimate.

Compiled by G. F. Wittig, *Electrical World*.



Millions of kilowatt-hours yearly for electric railway service



Monthly consumption of energy for electric railways

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When Is a Car Not a Car?

By H. S. Williams
Assistant Superintendent of Equipment Department of Street Railways, Detroit, Mich.

THE answer to this question is that a car is not a car when it becomes a carcass. In other words, when it is a thing devoid of sales value or appeal to the traveling public—a cavernous body into which funds are unavailingly poured.

As the result of an effort to devise some definite method of calculation by which it can be determined just when a car should be relegated to the junk heap, a simple formula has been evolved in which a figure is set up for the old car and another for the proposed new car with which it is to be replaced. When these figures are equal, or specially when the figure representing the old car exceeds that for the new car, then the retirement of the old car is not only justified but demanded. Expressed another way, when the value y in the formula equals or exceeds the value x, then the scrapping of the old car is advisable. This computation is based upon the cars rendering equivalent service.

$$x = [\,(a - k) \times (\frac{i}{2} + j)\,] - h$$

x = \$946.00 and y = \$2,638.35

x = Annual cost of the proposed new car.
y = Annual cost of the old car.

a = Estimated cost of new car.
b = Maintenance cost per year of new car.
c = Maintenance cost per year of old car.
d = Operating cost per year of new car.
e = Operating cost per year of old car.
f = Seating capacity of new car.
g = Seating capacity of old car.
h = Added annual value of new car.
i = Interest rate on new capital.
j = Amortization rate on new car.
k = Scrap value of old car.

The first element of the formula $(a - k)$ is self-evident, as it represents the net cost of the replacement unit. The next is $i/2$, which is the average interest rate on the capital investment over a period of years, for it is evident that if the principal is reduced each year the interest is automatically reduced also. The item "j" is the amortization rate or the percentage of the principal that is paid annually. Thus if the car has an estimated life of twenty years it would be amortized at the rate of 5 per cent per annum. The factor "h" is an estimated amount expressing the worth of the new car in attracting added patronage each year. In figuring the net cost of the new car this amount should be deducted. Ordinarily this amount will not be large enough to affect greatly the net result.

There is little explanation required for the balance of the equation. The factor $(c - b)$ is the difference in the cost of maintenance between the old and new cars as represented by accounts 30, 33, 36 and 37. Similarly the element $(c - d)$ is the difference in operating costs. This would naturally include only those items which vary and so no general rule can be established that would cover every property. If the proposed car were of the one-man type or of different speed, then platform expense would enter. Likewise, if proposed changed equipment required more or less inspection, this would become a factor. Undoubtedly at the present time a proposed car would involve a change of weight which would affect the cost of power for propulsion as well as wear and tear on track. The ratio f/g is introduced to evaluate the difference in seating capacity, if any, and so place the two cars on a strictly comparable basis. The same value could be obtained by changing the car mileage of the new unit to compensate for difference in seating capacity.

Perhaps it might be well, for the sake of clarity, to carry this one step farther and work out a case using actual values, as follows:

	Old Car	Proposed New Car
Cost	.....	\$14,000.00
Weight, pounds	42,000	34,000
Seating capacity	40	52
Car-miles per year	36,000	33,000
Ton-miles per year	756,000	561,000
Interest rate on new capital, per cent	.....	6
Estimated life of car, years	.....	20
Amortization rate, per cent	.....	5
Maintenance of equipment per car-mile	\$0.026	\$0.016
Car maintenance cost per year	936.00	528.00
Energy for propulsion per ton-mile	0.0024	0.0024
Energy cost per year	1,814.40	1,346.40
Track maintenance cost per ton-mile	0.0017	0.0017
Track maintenance cost per year	1,285.20	953.70
Platform expense per car-mile	0.147	0.147
Platform expense per year	5,292.00	4,851.00
Carhouse employees and expense per car-mile	0.0027	0.0027
Car-house employees and expense per year	97.20	89.10
Scrap value of old car	300.00	.....
Added annual value of new car	.....	150.00
Schedule speed, per cent	100	110

It is to be noted in the above that the portion of the operating accounts affected are the only ones figured. For example, under car maintenance account 29 is not taken into consideration, as it will remain the same whether the company operates old or new cars.

Substitute the above values and working out the two equations we find that:

x = \$946.00 and y = \$2,638.35

Thus it is established that it would be profitable to purchase new equipment.

Attention is called to the figure assumed for the added annual value of new car, which is extremely low, being of the order of 50 cents a day. Estimates from properties using modern equipment show increased riding values of around 4 per cent (see Electric Railway Journal, Vol. 69, page 295), although much higher values have been reported from time to time. On such basis the increased value of this car would be \$619 instead of the \$150 shown. There is an intangible value in good will which new equipment gives, but no attempt has been made to evaluate this. If the new equipment be capable of greater speed and acceleration than the old, this value would be reflected in the various items of the equations in which car mileage is a factor, as equal service would be rendered with less mileage. Thus in the above estimate the proposed car is capable of 10 per cent higher schedule speed and the annual mileage is reduced by this amount to give equivalent service. Also the platform expense is reduced by a like percentage and car cleaning and inspection follows suit.

An analysis of these figures shows that the most important factors are car weight, seating capacity and schedule speed. It goes without saying that these items should be given prime consideration in the discussion of new cars. It is thought, however, that expressing the various factors in algebraic form, as shown herewith, gives a clearer conception of their relative importance and will be of assistance in proving the economic value of new cars.

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Birdseye view of Acton overhaul shops, London Underground Electric Railway. These shops are being altered so as to adapt them to the method of overhaul by conveyor platform

Overhaul by Conveyor Platform

By Henry W. Blake
Senior Editor *Electric Railway Journal*

European electric railways adopt Henry Ford's construction methods in the overhaul of their equipment. Entire shop based on this principle designed by the London Underground Electric Railway

WHILE the principle of the slowly moving conveyor for assembling equipment is identified in the popular mind with the Ford motor plant in Detroit, it has been adopted by other manufacturers under circumstances where its use seems suitable. Its advantages, of course, are that workmen, individually or in gangs, can work on one kind of job continually and so become expert at it, and also that there is a definite limit to the time that they can take for each process. These conditions promote quality and rapidity of output.

It is interesting that several European electric railways have adopted the same principle in the overhaul of their equipment. The largest undertaking of this kind on the Continent of Europe is undoubtedly that of the Berlin Surface Lines, where the present overhaul schedule requires twenty cars to be put through the shop each week. The conveyor table for motor assembly at the main shops of the company is shown in the illustration on page 304.

The conveyor is made up of wooden plates bolted to steel links. It has a length of about 20 m. (65 ft. 8 in.) and a width of 1.5 m. (5 ft.) with a carrying capacity of about 1,000 kg. (2,200 lb.). It moves at a speed of 2 m. (6 ft. 7 in.) an hour. Six distinct processes are performed on the conveyor in the assembly of a motor, as follows:

The conveyor starts with an empty motor shell, and the first workmen slips in the field coils.

In the second process the distance between the poles is measured and corrected, if necessary.

The third process consists of connecting the field cables.

In the fourth process the armature, brush-holder and bearings are inserted in the shell.

The fifth process consists of closing the motor up and the sixth process is the electrical test.

At present it is possible to put ten motors through these processes in a day of eight hours, which is all the time that is needed with the existing schedule. The conveyor has been in use since about April of this year,

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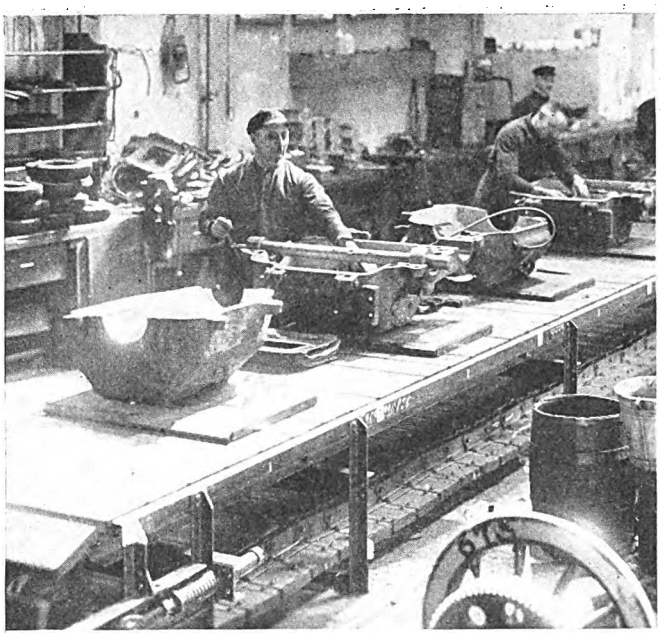

Workmen in the overhaul shops of the Berlin Surface Lines assemble motors on this conveyor platform

and it is expected that the work can be speeded up if necessary, as the men become more accustomed to the plan.

While the motor equipment is going through the shop and then being assembled the car bodies are passing through a somewhat similar process, though not on a conveyor platform.

First the bodies are raised by jacks and mounted on dummy trucks, when the regular trucks and motor equipment are taken to the motor shops. Where the motor equipment is attached to the car body and no trucks are used, as in the last 1,000 cars purchased, the axles with their motor equipment for the one car are kept together in their normal position by a wooden spacing piece, as shown by an illustration on page 302. They are taken in this position to the shops.

In the second process to the car bodies the framing and paneling are fully gone over and rotten or dented parts are removed. Although the more recent Berlin cars are steel, the company still has a good many wooden cars. Incidentally, it might be said that in the car framing the corner posts are at the ends of the bulkheads and not on the platforms, because of the great number of vestibule injuries suffered through street collisions. The company therefore keeps in stock standard vestibuled platforms for attachment to car ends.

In the third process new wood or metal parts are inserted and all joints and metal braces are painted or otherwise protected from dampness.

In the fourth process the side panels are attached, any other body work required is done and the inside electrical equipment is completed. Incidentally, it might be said that the motor resistances are carried on the roof, and instead of being of cast iron are of a special wire called resistine, made by the A.E.G.

WHAT DO OPERATING STATISTICS TEACH US ?

	1921	1922	1923	1924	1925	1926 / Quarter Year	Methods of Keeping Down
Grease Consumption every 100,000 car Km.	279.4 Kg.	181.8 Kg.	150.5 Kg.	97.5 Kg.	75.0 Kg.	65.47 Kg.	Suitable material. Better lubrication inspection. Education of the force. Systematic inspection. Uniformity of lubricant.
Armature Failures every 100,000 calculated Km.	0.37	0.49	0.25	0.07	0.01	0.003	Better bearing support of the armature in its housing. Organized inspection. Education of the force. Better attention to renewal of bearings. Introduction of roller bearings.
Field Coil Failures every 100,000 calculated Km.	1.75	1.86	0.61	0.45	0.9	1.16 Increases are caused by replacements before actual failure has occured, as found desirable by closer inspection	Better inspection through test. Education of the force. Reduction in number of motor types.
Brake Shoe Consumption every 100,000 car Km.	69.6	65.4	59.5	33.6	20.0	18.2	Suitable material. Better brake rigging. Better maintenance. Substitution of electric for air brakes
Axle Bearing Consumption every 100,000 car Km.	4.7	4.8	5.1	5.9	2.75	1.57	Suitable material (Lurgi metal). Better lubrication. Education of the force. Change from air to electric brakes.
Trolley Wheel Consumption every 100,000 car Km.	15.7	13.0	13.5	13.4	5.23	2.54	Better attention to design of axle bearing. Use of better material. Increase of trolley wheel diameter.
Car Pull Ins every 100,000 calculated Km.	41.2	33.7	21.9	19.2	15.0	14.0	Change from air to electric brakes. Improvement of the electrical equipment. Systematic inspection of the equipment.
Hot Journals every 100,000 calculated Km.	3.3	2.5	1.6	0.8	0.38	0.36	Better lubrication. Suitable material for journal bearings.
Gear and pinion Consumption every 100,000 car Km.	0.94 5.2	1.0 2.4	0.89 2.1	0.94 1.2	1.17 1.11	0.75 0.61	Use of harder steel for gears Suitable lubrication. Better fitting of the gear cases.

Typical charts of this kind showing progress made in better car maintenance are posted in the inspection and repair shops of the Berlin Surface Lines to encourage the men to better work

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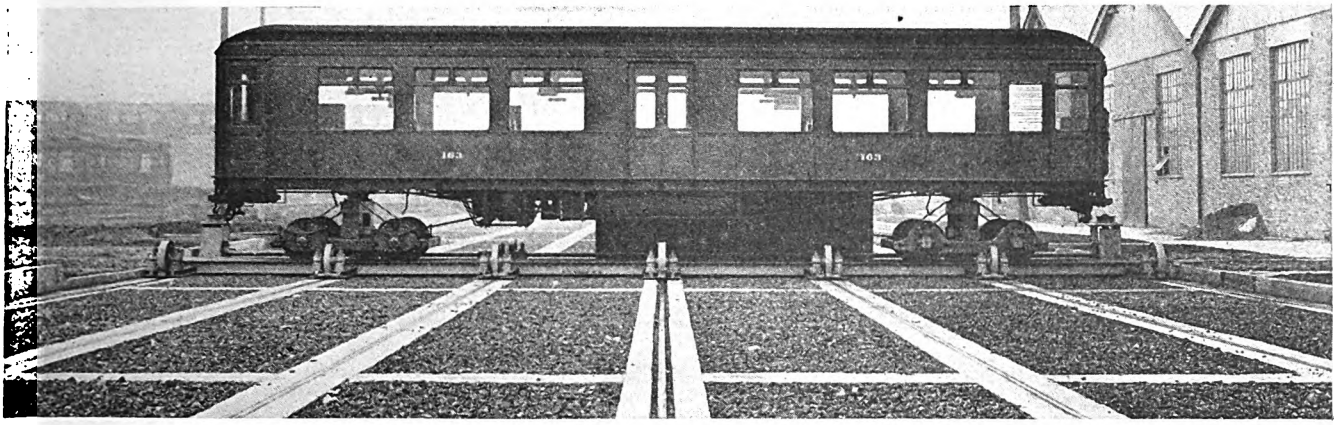


Transfer table, or traverser, used in the Acton overhaul shops of the London Underground Electric Railway. Note the neat appearance of the pit. This is characteristic of the surroundings of the shops and depots of this company Many of them have flower beds

The fifth process on the car bodies is to drop them back upon their running gear or trucks and put on the inside fittings.

It is appropriate here to say that on all cars purchased since 1924, 1,300 in number, the car journals are fitted with S.K.F. roller bearings. The journal box has a boss or flat space at the bottom under which a jack can be inserted when the car body has to be raised. These roller bearings operate in grease and will run two years, or 120,000 km. (75,000 miles), without further lubrication. The equipment engineers of the company declare that roller bearings are the greatest improvement in rolling stock made in recent years and consider their use is essential for success with the Cardan drive type of motor propulsion.

These roller bearings are cleaned once a year. At these times they are removed from their housings and dropped into a tank filled with cleansing fluid. At the bottom of this tank a group of magnets draws out any steel particles which may have got into the bearings. Roller bearings are also used for the armatures of all new motors. To prevent the return current passing from the motor frame to the wheels through the roller bearings, and hence possibly pitting them, each axle of every motor car with roller bearings is fitted with a collector ring with carbon contacts which are electrically connected to the motor frame.

In recent inside car fittings for such parts as grab handles, stanchions, etc., chromium plating is used instead of nickel. It is harder than nickel and does not tarnish. The chromium is put on the steel or brass in an ordinary plating bath and the finished plated object looks just as if it had been plated with nickel. Of course, this process is used to a considerable extent in America by automobile manufacturers both to give a hard wearing surface, as on piston pins, and for its finish and tarnish resisting qualities, as on radiators. In Germany the electric railway companies are also employing it quite generally for the parts mentioned, and several have their own plant equipments.

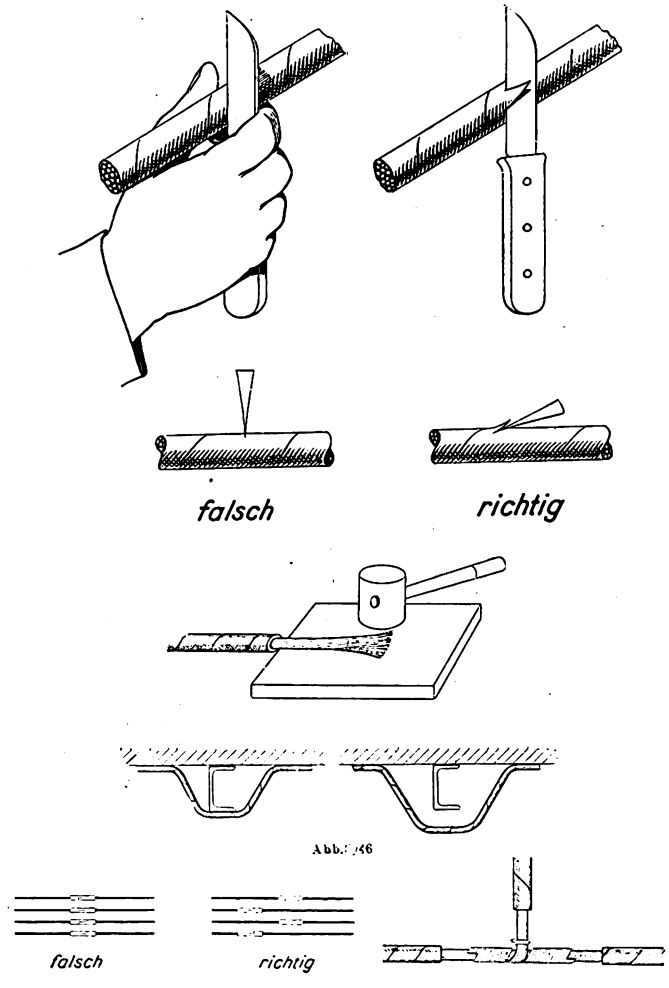
A feature of overhauling in Berlin is that every car after passing through the shop is marked with the date of its departure and the extent of the overhauling given. A typical marking, which is in small letters on the outside of the car on the lower panel, reads as follows:

Strb. Unt. H. W. Lack, N.A.G.R. 30, 1 V, 27, 0.Dy. 4.92 a.

This lettering indicates the extent of the repairs made at the main shop, their date and the type of the motor.

To encourage careful maintenance and daily inspection in the carhouses, charts are posted there from time to time to indicate the savings made in recent years. A typical chart of this kind is published. A handy guide on car equipment inspection, written by the chief engineer of the company, E. Kindler, is also put in the hands of every man engaged in this work. A typical page is reproduced.

This article began with a reference to the adoption of the conveyor system by the London Underground



An aid to better maintenance in Berlin is a hand book of instructions, prepared by the engineering and maintenance department. This page reproduced from the book shows the false and correct methods of stripping insulation and making loops and connections.

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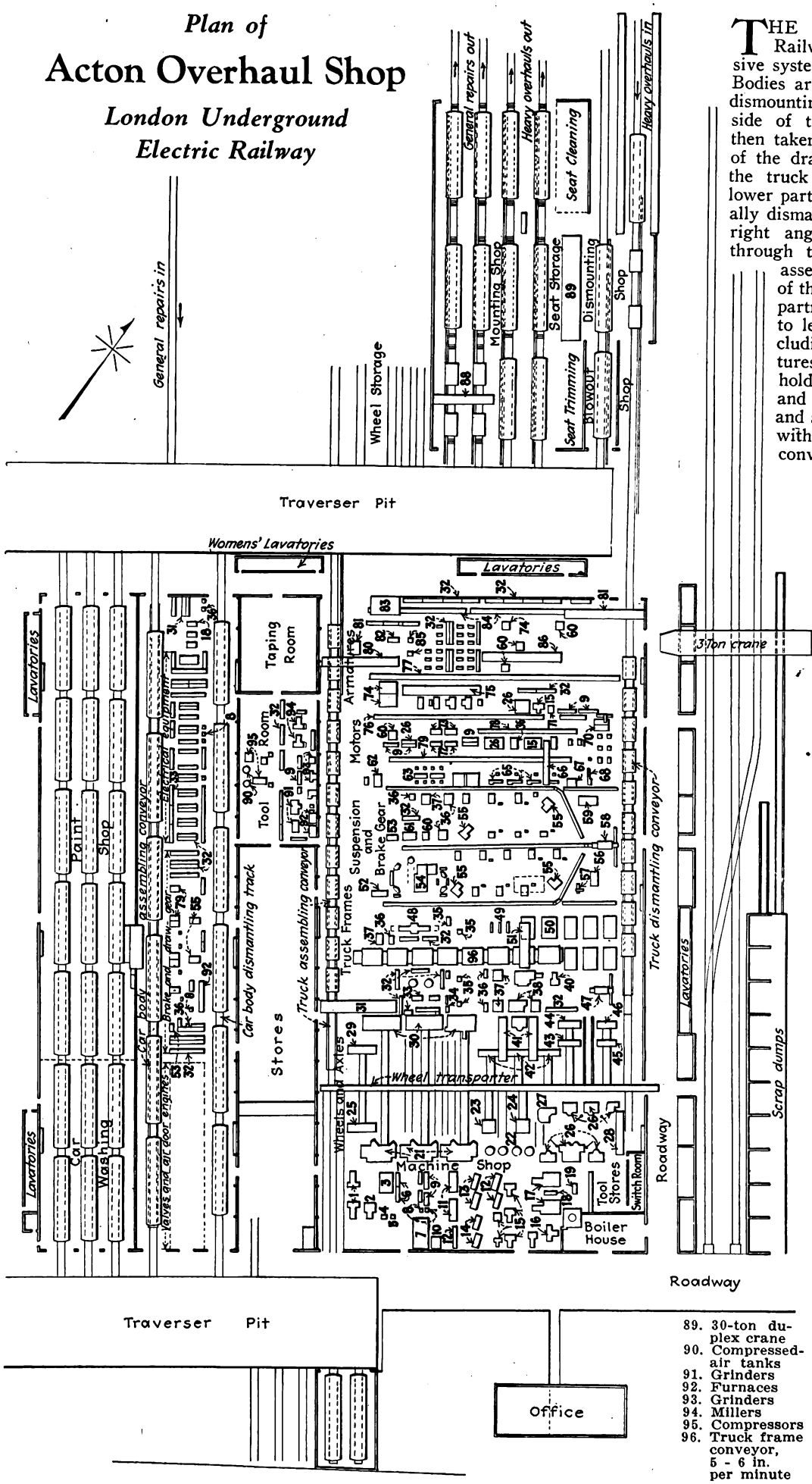
Plan of Acton Overhaul Shop

London Underground Electric Railway



THE London Underground Electric Railway has adopted the progressive system of repairs for its Acton shops. Bodies are lifted from their trucks in the dismounting shop (in the lower right hand side of the drawing). The bodies are then taken to the shop (in the upper part of the drawing). The trucks proceed on the truck dismantling conveyor (in the lower part of the drawing), and are gradually dismantled, the parts being shunted at right angles (upward in the drawing) through the different bays to the truck assemblying conveyor (in the middle of the drawing). The truck repair departments in their order, from right to left, are shoe beams, motors (including separate conveyors for armatures, motor case covers, etc., brushholders and motor cases), suspension and brake gear, truck frames, wheels and axles. The trucks are assembled with their equipment on the main conveyor, in the middle of the shop.

Key to List of Tools

1. Surface grinders
2. Slotter
3. Double shaper
4. Press
5. Gear cutter
6. Drills
7. Overhead ventilating plant
8. Grinders
9. Lathes
10. Key seater
11. 10-in. combination lathes
12. 10½-in. lathe
13. Turret lathe
14. Capstans
15. Horizontal millers
16. Vertical millers
17. Plano millers
18. Stand
19. Marking-off table
20. Benches
21. Wheel lathes
22. Electric heaters for tires
23. Rolling machine
24. Riveting machine
25. Axle journal grinder
26. Borers
27. Tire drill
28. Two-ton crane
29. Axle journal lathe
30. Wheel lathes
31. 15-ton crane
32. Benches
33. Racks
34. Die casting machine
35. Welding plant and tables
36. Drills
37. Shaper
38. Slotters
39. Plano miller
40. Horizontal miller
41. Two-ton crane
42. Wheel presses
43. Ring turning machine
44. Gas heater for tires
45. Rivet removing machine
46. Gas heater
47. Washing plant
48. Planer
49. Bolster repairs
50. Hornblock miller
51. 5-ton crane
52. Spring tester
53. Screwing machine
54. Spring furnace
55. Hammer
56. Punch and shears
57. Exhaust fan
58. Washing plant
59. Annealing oven
60. Press
61. Duplex borer
62. Automatic coil winder
63. Taping machine
64. Impregnating plant and oven
65. Field-coil winding machine
66. 3-ton crane
67. Annealing oven
68. Stripping machine
69. Motor case blowout
70. Blowout plant
71. Shaper
72. Armature white-metal plant-bearing
73. Suspension white-metal plant
74. Oven
75. 2-ton crane
76. Conveyor for motor case covers, frame heads, gear pans, suspension bearings and boxes
77. Armature transporter
78. Conveyor for brushholders, supports and leads
79. Forges
80. Three-ton crane
81. High-tension tester
82. Slotter
83. Overhead ventilating plant
84. Conveyor for shoe beams
85. Sweating
86. Two-ton crane
87. Three-ton crane
88. Five-ton crane
89. 30-ton duplex crane
90. Compressed-air tanks
91. Grinders
92. Furnaces
93. Grinders
94. Millers
95. Compressors
96. Truck frame conveyor, 5 - 6 in. per minute

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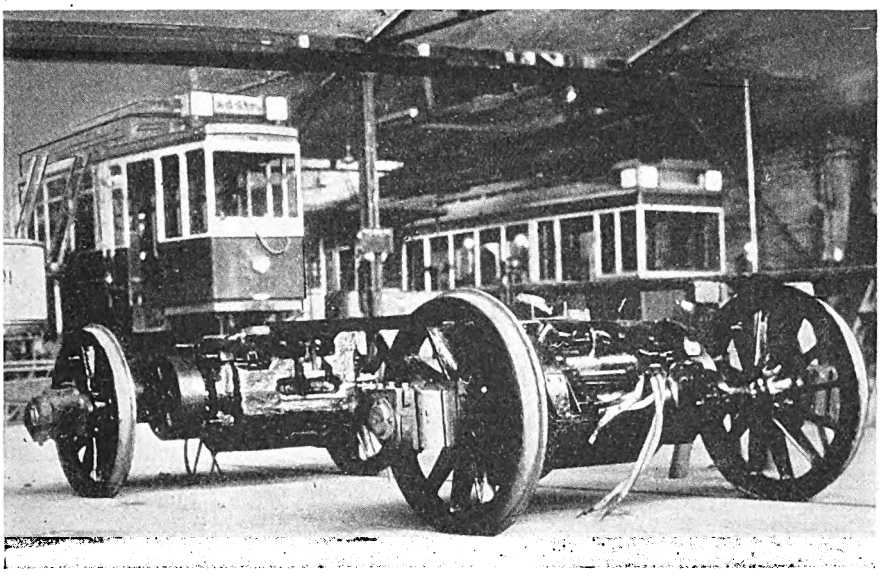
Electric Railway System. This installation is being put in the Acton shops, and it is expected that it will double the output of cars within a specified time. The same principle has been applied for bus overhaul in the shops of the London General Omnibus Company, which is controlled by the same interests. So far as is known this is the largest application to electric railway shops.

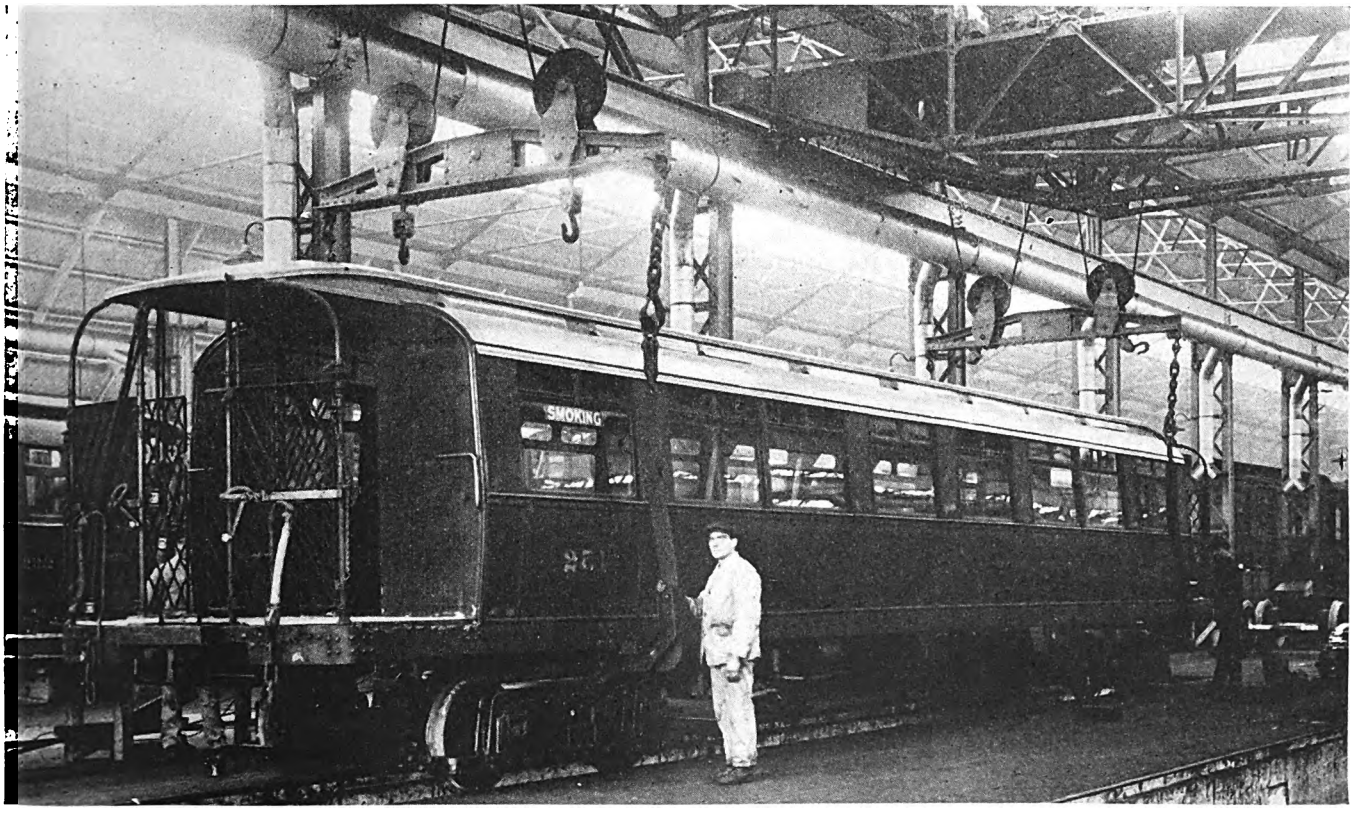
The cars for heavy overhaul enter the shops at the northeast end, shown in the lower right-hand corner of the drawing on page 306. Here the car body is lifted by the crane illustrated below. The crane is equipped with two motors connected by a shaft so that they operate at the same speed; hence, the car body will not tilt. This crane places the car body on dummy trucks which raise it about 4 ft. above its normal position. Then if it requires heavy body work it is taken to the wood shop on dummy trucks, and if it should need painting only, to the paint shop. Movements in this dismounting shop are made by a haulage chain, to which is attached a so-called "carrier," which can be clasped to the chain by a link or bar. This chain runs at a rate of about 30 ft. per minute and is about 15 in. outside of one of the rails. When the car has reached the point desired a single movement of the bar releases the car from the chain. Movement between buildings is by transfer table or traverser.



A wooden spacing bar holds the motors and wheels of the truckless car in their proper position while being taken for overhaul to the motor department in the Berlin repair shops

In the meantime the trucks with their equipment pass to the machine shop through which they move by conveyor. The speed of this conveyor is 6.7 in. per minute, so that about 6¾ hours is required by it to travel from one end of the shop to the other. As the truck and equipment are carried along on this conveyor the various parts are taken out to be shunted at right angles for repair, so that the last part is taken off the main conveyor before the end of the shop is reached.

The first of these bays at right angles to the main conveyor is devoted to motor repairs, because in some cases these may be the only repairs required to the equipment. Here there are conveyors at right angles to the



After entering the overhaul shop, the car body is lifted from the trucks by this special crane. The trucks then go to the truck shop and the body to the body shop

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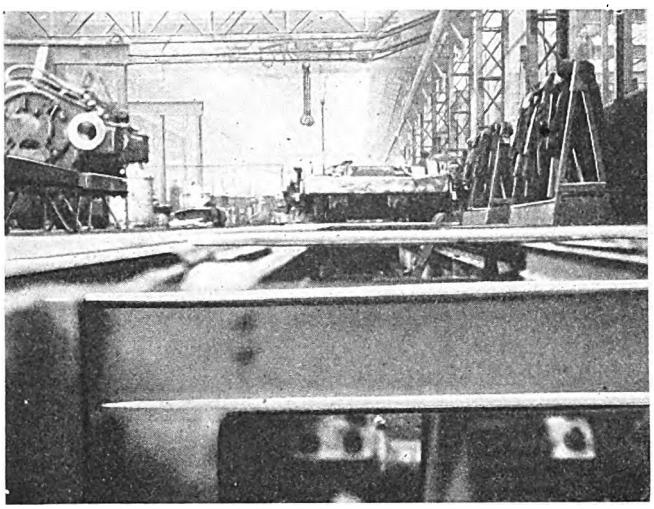

View at floor level, with part of floor removed to show driving mechanism, of truck assembly conveyor at Acton

main conveyor for dismantling and reassembling the motor parts. The motors in this department are put through in batches because the company has several types of motors. In a similar way there are other conveyors or rollerways for the suspension and brake gears, truck frames, wheels and axles. Each of these bays is equipped with machinery for the work to be done there.

As the parts emerge from their various bays they pass onto the truck assembly conveyor, which moves in the opposite direction from the dismantling conveyor; i.e., from left to right as one looks at the drawing. On this conveyor the truck is put together part by part, and toward its outer end (to the right in the drawing) the flooring on each side of the conveyor is broken away so that men can work underneath. This conveyor operates at the same speed as the incoming conveyor, or 6.7 in. per minute.

Both conveyors are made of wooden planking resting on chain links on which are mounted 5-in. diameter rollers. The conveyor operates over large sheaves at each end. As it returns upside down, the wheels are uppermost, but the chains slide along a greasy track, so that there is little friction.

If complete overhauling is not required but certain parts require attention, as when a car needs simply new motors or wheels, it is put on a special track and its defective part taken out and a new one substituted.

The car body shop operates also upon the progressive system, but the cars are moved when required by a chain instead of continuously by a conveyor. This chain, which is fitted with carrier and link like that in the dismounting shop, is located about the same distance from the rail as in that shop and operates at a speed of about 10 ft. per minute. The cars come in here on dummy trucks and after reaching their desired position are disconnected from the chain. The equipment on the car body, such as compressors, switches, brake rigging, etc., is then progressively removed and the necessary repairs are made. The car bodies are then taken to the paint shop, where there is also a progressive movement. The time for painting is three days. Certain tracks in the shop are for complete jobs and others for retouching.

The shops are not yet in full operation by this system, but the main conveyors are in, and it is expected that the entire change-over can be effected by the end of this year.

Operator Establishes Loan Fund

THROUGH R. G. Carroll, manager of the Galveston Electric Company, Galveston, Tex., it was recently announced that Stone & Webster would establish a $10,000 student loan fund for the benefit of engineering students at the Texas College of Agriculture and Mechanics. Plans and details for the loan were worked out by Messrs. Carroll, Burke and Clifford and Dean F. C. Bolton.

Loading Platforms Reduce Accidents at Allentown

BECAUSE much through automobile traffic uses the streets where the tracks of the Lehigh Valley Transit Company are located in Allentown, Pa., ten loading platforms have been built to aid passengers boarding and alighting from cars. At first they were built only 50 ft. long, because the city authorities feared that a greater length would cause traffic congestion. Later the length was increased to 100 ft. They are built of concrete and are 12 in. high. A strip of steel protects the edge of the concrete. The outer side is painted in black and white squares to increase the visibility of the platform. At the end of the platform is a concrete bumper surmounted by an electric light. According to the police department, street accidents have been reduced 80 per cent since the installation of these platforms.

Concrete loading platform at Allentown is 12 in. high and 100 ft. long

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Most breakage occurs at edge of commutator slots and is greatest on small motors. The direct cause of breakage is vibration, which causes oft-repeated movement. Remedy lies in better support for leads and freedom from abrupt bends

Methods Used to Prevent Breakage of Armature Leads

By F. W. McCloskey
Motor Engineering Department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

BREAKAGE of leads which connect the armature winding to the commutator has always been a troublesome problem in direct-current railway motors. Few, if any, of the smaller and medium-sized motors have been entirely immune from this trouble. Epidemics of broken leads have occurred under more or less mysterious circumstances difficult to explain, considering that often on other properties the same type of motors operated almost without lead breakage under similar conditions. The study of this question has therefore been one of importance and interest both to operators and manufacturers.

The breakage is usually at the edge of the slot where the leads enter the commutator. In certain designs the breakage occurs a short distance behind the commutator, where the leads make an abrupt bend. Occasionally breakage of leads occurs under the front steel band which is wound over the coil ends and leads, or still more rarely near the core where the lead leaves the coil.

Broken leads in the larger strap wound armatures are rare, and the cause in this instance does not appear to be the same as for the smaller wire. The motors most inclined to this kind of trouble are those rating from 25 hp. to 125 hp. In armatures up to about 60 hp. some 80 per cent of the failures occur in the top leads. In motors above this size the bottom leads give a greater proportion of the trouble, but in these sizes too breaks of the top leads predominate.

The direct cause of the breaking of armature leads is due, in general, to a slight movement frequently repeated, with resultant localization of stress at the bends in the lead, most particularly at the point of attachment to the commutator. A large contributing cause is that the elastic limit, ultimate strength and endurance of copper are low when subjected to repeated bending. It is probable that if an armature were kept in service long enough all the leads would break off at the commutator if any movement whatever is permitted. In this respect copper is quite unlike steel, which up to the endurance limit can be subjected to repeated stress indefinitely. Up to comparatively recent years a quite common cause of this movement of the leads was that the commutator or core was loose on its seat. Improvements in design and manufacture of modern types of railway motors have eliminated these particular causes.

The modern motor is, nevertheless, subjected to many sources of vibration, such as gear vibration, track conditions, magnetic reaction, etc., which are the principal factors in broken leads. Little is at present known about the calculation of stresses in the leads. Until more theoretical studies have been made, which may throw light on the subject, it is necessary for the motor designer to minimize the effect of these stresses and prevent their concentration at any particular points. A means has been found which has been successful to a very large degree, and in arriving at this solution the designer pursues the following line of reasoning:

Bending Stresses Distributed Over Maximum Length

If a single piece of round or rectangular wire is gripped in a vise, leaving say 5 in. extending beyond the jaws of the vise, and if the wire is bent back and forth a few times it will break at the point where the wire leaves the grip of the vise. If a similar piece of wire is reinforced at the portion gripped in the vise and to a point say $\frac{1}{4}$ in. beyond the edges of the jaws by means of copper sheet wrapped and soldered about the wire, we shall find that several times as many bends back and forth are required before the wire will break. This is for two reasons: First, the section at the former breaking point is stronger due to the added strength of the wrapper; second, because the action of bending is distributed so that it is not concentrated so much at the edge of the jaws as formerly. This results from the more gradual stepping down from the very rigid condition of the wire within the jaws, through a less rigid condition in the section $\frac{1}{4}$ in. long, to a still less rigid condition in the bare wire itself. This gives the effect of fillets as applied in a shaft where the sections vary abruptly in diameter. The fillets increase the actual strength of the shaft considerably, by distributing the bending stresses.

Phosphor bronze sleeves were first applied to armature leads in motors rating around 100 hp. and having a two-turn ribbon coil as illustrated in Fig. 3. A sleeve made from sheet phosphor bronze $\frac{1}{64}$ in. thick was slipped over the end of the wire, the proportions being such that a fairly snug fit on the wire was obtained. To assure an intimate soldered contact between the sleeve

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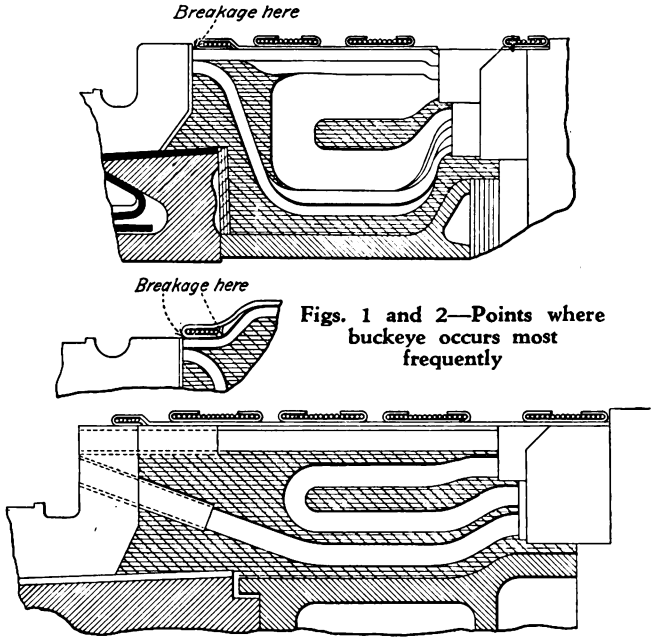
and the lead, the phosphor bronze sleeve was made from a sheet that had been tinned. The leads with the sleeve in place in the commutator slot during the soldering of the commutator become thoroughly soldered. The strength of phosphor bronze being four to five times that of copper, it is evident that the sleeve adds considerable strength to the plain copper wire. Also, the effect of a fillet is gained by stepping down more gradually from the rigid commutator to the relatively flexible lead.

This construction was put into regular production about twelve years ago on a type of motor which had previously been subject to lead breakage when not supplied with the phosphor-bronze sleeves. This feature has been added to all motors rating about 100 hp. of several different types, with good results in each case.



Figs. 1 and 2—Points where buckeye occurs most frequently

Fig. 3—Application of phosphor bronze sleeves

As previously stated, breakage of leads occurred in certain of the older designs about 1 in. behind the commutator in the top leads. In these designs the diameter of the commutator was considerably less than that of the front end of the winding, which necessitated a rather abrupt bend in the lead downward toward the commutator neck. This condition is shown in Fig. 2, and resulted in concentration of stress and more or less breakage at this location. The extent of this breakage was never as great as at the point of attachment to the commutator, but was, nevertheless, quite serious. The diameter of the commutator neck was therefore increased so that the top leads could be brought out without any appreciable drop. This accomplished the double purpose of facilitating the application of the phosphor bronze sleeves and eliminating the breakage which occurred formerly at the drop of the lead.

In the small motors, 25 to 60 hp., the sleeves have not been adopted, owing to the difficulty of applying them to the more flexible small leads. Therefore, a substitute remedy was sought which might be applied more readily. The remedy has been found in a special cement treatment of the leads, applied immediately behind the commutator neck. The process for application is as follows:

After the insulating foundation for the top leads has been completed in the usual manner, the loose sleeving on the top leads is removed to a point about $\frac{1}{4}$ in. beyond the end of the double cotton covering on the leads. Each lead is then taped with a good grade of friction tape from a point about $\frac{1}{2}$ in. behind the commutator neck to a little beyond the point to which the loose sleeving has been cut back. The leads are then laid down in one or two layers, depending upon the amount of room that is available for the leads. This varies with different designs. If two layers are required, every other lead is bent back out of the way and the remaining leads are laid down in one layer, shaping them so as to obtain compactness; that is, each lead lying snug against its neighbor. This matter of compactness is especially important in the region from 1 in. to 2 in. behind the commutator. Suitable insulation in the form of cotton webbing, untreated, is wound next over the first layer of top leads, and the second layer of top leads is then laid down. After the leads are soldered to the commutator, the armature is heated in an oven until its temperature is about 70 deg. C. and the winding is completed, with the armature hot, as follows:

1. Temporary bands are wound on the core and the rear coil ends.

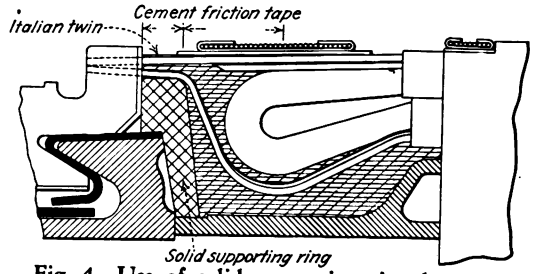


Fig. 4—Use of solid supporting ring between coil support and leads

2. The leads and end winding at the front end are drawn down by means of a $\frac{3}{8}$-in. soft rope as the armature is turned slowly in the banding lathe. To aid this operation it is sometimes necessary to tap down the leads lightly with a mallet as the rope is being wound on. The rope is then removed.

3. A special cement is applied just behind the commutator neck in the spaces between the leads, which are bare for a distance of about $\frac{1}{2}$ in. (Fig. 4.) The consistency of the cement should be about that of thin putty. The cement is worked between the leads and spread over them for a distance of about $1\frac{1}{4}$ in. behind the commutator neck. For this purpose a narrow putty knife serves very nicely. When applying the cement the armature need not be more than comfortably warm.

4. Twine is wound on in a single layer, starting at the commutator neck and ending about $1\frac{1}{4}$ in. behind the commutator. This serves to seal at the commutator neck and at the same time presses the cement firmly between the leads and retains it there during subsequent baking.

5. The armature is again heated to about 70 deg. C. and then dipped and baked.

6. Temporary bands are removed after the armature is cold and the permanent bands are applied.

7. The commutator is finished in the usual manner.

This method of attacking the broken lead problem has been tried out on a number of properties and in each case marked benefits have been obtained. Many of the armatures thus treated have been in service two or three years and the life thus far obtained is from two to five times that obtained with the same armatures treated in the ordinary manner. No failures have recurred in any of these armatures.

An important point in this treatment is to use a cement that will remain slightly flexible after baking and which

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will not crumble or crack under vibration conditions. The above cement treatment has passed the experimental stage and has been adopted as standard on all 25 and 35 hp. railway motors.

One of the conditions in an armature winding which encourages breakage of leads is the relatively large amount of insulating material in the form of tape, which ordinarily is used as a filler between the ends of the coils and the commutator. This material dries out, which in time produces a drum-like condition in the lead structure, thus promoting vibration and movement of the leads. To improve this condition a solid ring of insulating material, pressed or turned from a solid block, is used as a filler between the coil support and the leads (Fig. 4). This ring also provides a much more solid support for the leads than can be obtained with the tapings usually employed.

The ring is assembled on the front coil support prior to the pressing on of the commutator. The fit between this ring and the coil support is made quite snug so that after the armature is dipped or baked a very solid and substantial job is obtained. This construction is being applied to the smaller motors.

A construction similar to this was first tried out by the Milwaukee Electric Railway & Light Company. In this instance a similar ring was used, except that it was split. This construction has given good results and has the advantage of being readily applied in case of renewals. For new motors the solid ring is preferred as it gives a more substantial support.

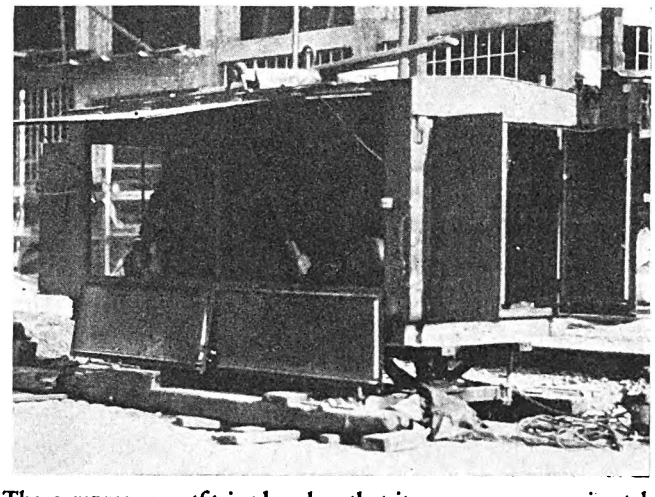
In conclusion it may be said that with the phosphor bronze sleeves as applied to the larger motors around 100 hp., and the cement treatment with solid ring construction as applied in the smaller sizes, a very substantial gain has been made in the direction of reduced maintenance and greater reliability in service.

Speedy and Economical Track Raising

BECAUSE of the ever-changing condition of the subsoil in certain sections of San Francisco it is necessary for the Market Street Railway, from time to time, to raise its tracks to a new established grade line conforming with that of the street as established by the City Engineer's office. Each year this forms a considerable part of the program of track maintenance and rebuilding of this company. That it will confront this property for some years to come is evidenced by the fact that portions of Market Street, the main thoroughfare of the city, have been raised in the last twenty years as much as 13 ft. Other streets have been raised even a greater amount.

At present the company is working on two sections of track, one on East Sixth Street, where the track is being raised 3 ft., and the other on Folsom Street south of Fourteenth, where it is being raised a maximum of 12 in., with an average raise of 8½ in. The conditions on Sixth Street developed in just fourteen years. It was in 1912 that the track was brought to grade, and now in 1926 it must be raised a maximum of 3 ft.

On Folsom Street between Fourteenth and Sixteenth a total of 2,420 ft. of single track is being raised a maximum of 12 in. As this track is of the more recent type, incorporating concrete stringers between ties and the heavy type of rail on redwood ties, particular care was exercised to save as much of the original construction as possible in order to do the job economically and speedily. On Sixth Street the track construction was not of the present standard and the entire track structure was torn down and rebuilt to the higher grade.



The compressor outfit is placed so that it can serve approximately 900 ft. of track. Air-operated concrete cutters and ballast tampers are used

Standard track construction calls for a 9-in., 106-lb.

Extensive track raising to bring it to a new grade is required periodically in San Francisco because of the sinking of the filled land

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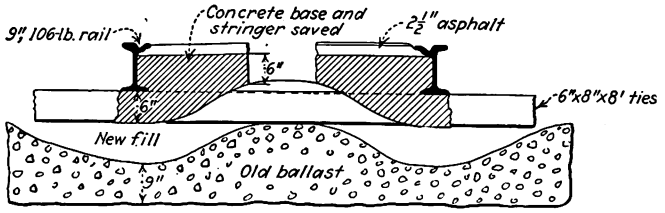
grooved girder rail carried on untreated redwood ties spaced on 2-ft. centers. This track is carried on 9-in. ballast under the tie and a transverse concrete stringer 6 in. deep poured around and under the rail and between the ties. A typical cross-section is shown in an accompanying illustration. A 2½-in. asphalt wearing surface without headers is laid on top of the concrete. This type of construction was used on Folsom Street.

Preparatory to raising the tracks, the wearing surface is removed between the outside rails and 2 ft. on either side. The device used for removing the asphalt from between the rails expedites the work and is economical.



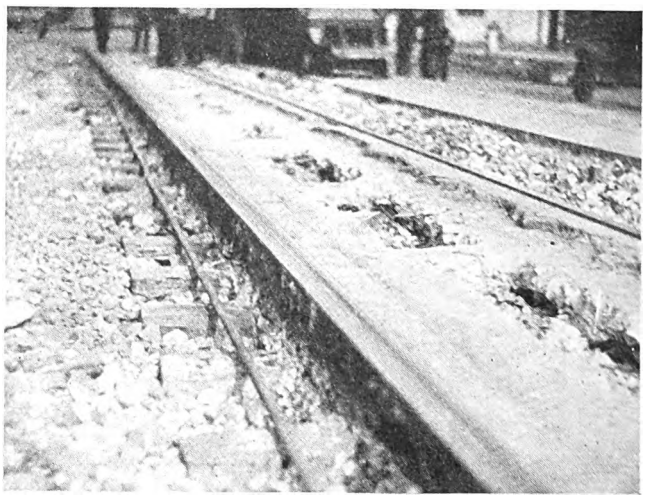
Typical cross-section of standard track used on paved street in San Francisco. The portion of concrete base and stringer saved is indicated. It also shows how the track structure is raised and the ballast added between the concrete and the original ballast

It was built several years ago. A steel plate about 3 ft. square with a sharp cutting edge in front is riveted to a tee-rail which is connected to the coupler of a motor work car. The sharp front edge of the plate rests in the track on the paving base. To the plate is attached a wood runway 5 ft. wide leading up over the end board of the car. The apparatus is on an incline of about 30 deg. with the horizontal. The lower end of the apparatus is provided with a pair of car wheels which rest on the rails and prevent the scoop from digging in too deeply when there is no paving base. The car is run ahead, forcing the sharp edge of the plate under the asphalt sheet, causing it to move up the incline into the car. It is possible to operate this car under favorable conditions at about 3 m.p.h. The remainder of the asphalt wearing surface between tracks and the outside is cut away with hand picks and shovels.

After the wearing surface is removed a trench approximately 12 in. wide is cut through the concrete base and stringer at the center of each track. Also the concrete is cut away on the outside of the rails. This exposes the ends of the ties and also a short section at the center. As the track is carried on rock ballast, it is possible to jack up the entire structure, the concrete moving intact with the rails and ties. New ballast is dumped in and around the track construction and tamped into position by pneumatic tampers. Original construction calls for 9-in. ballast under the tie at the rail. It will be seen from the accompanying illustration that with a maximum raise of 12 in. the ballast at that point will amount to 21 in. This would be the method of building up the grade where the elevation does not exceed 12 in. Beyond this, however, it would be impracticable and uneconomical to use rock ballast for the fill. Ordinary earth fill would be used, making allowance for a 9-in. ballast bed on top to carry the track. Air for operating the ballast tampers and also the concrete cutters for removing concrete in the trench and around the end of the ties is furnished by a compressor outfit. It is driven by an electric motor and the entire outfit is mounted on a framework and skids housed in and provided with a link on top, so that the crane may move it from place to place. It is set alongside the track and connected to 450 ft. of pipe so that 900 ft. of track can be tamped at one setting. Four tampers are used at each tie. Six men and a foreman tamp about 200 ft. of single track per day. A special trolley pole with a horizontal extension arm and pan makes contact with the under side of the trolley wire so that cars can pass without removal of the pole.

With the track in position at its new elevation, concrete is poured to complete the work, allowing for the 6-in. base and the 6-in. stringer under the rail. The company uses a small concrete mixer of its own for this work. However, the paving surface is laid by an outside contractor, the company finding it economical to have this work done outside. The company maintains a plant in connection with its material yard where it prepares asphalt compounds for patch repair work.

Considerable economy has been effected in track reconstruction work by saving as much of the original concrete construction as is possible. The concrete which is saved has already been referred to. Approximately $1 per lineal foot of track is saved in materials and labor, or approximately 30 per cent of the cost of replacing all concrete with new.



Concrete base and stringer are retained around each rail

The view at the left shows the double track on Sixth Street while being raised a maximum of 3 ft. The fill on this particular job was made with gravel.

As shown in the view at the right, in raising the modern track sections the concrete base and stringer are retained around each rail at a saving of approximately $1 per lineal track foot. The concrete is cut away from the end of the tie and in a trench between the rails. It is then possible to jack up the track structure and tamp in and around the ties under the rail with the air tampers connected to a compressor outfit.

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While track elevation work is carried on, temporary crossovers are located at each end so that single-track movement of traffic may be operated. These crossovers as built by the company are in three sections and may be moved by the derrick car.

Readers' Forum

Rigid Construction Will Not Solve All Track Problems

NEWARK, N. J., Aug. 3, 1927.

To the Editor:

There is one subject connected with electric railway track construction in paved streets which will probably never cease to draw fire from the adherents of one type whenever arguments are offered by those of the other type as to why the party of the first part is all wrong. I refer to the subject of so-called resilient versus the so-called rigid type of track construction, and the occasion of this letter is the abstract of the paper by A. C. Irwin of the Portland Cement Association, presented at the summer meeting of the Central Electric Railway Association, and which appeared on page 69 of the July 9 issue of the ELECTRIC RAILWAY JOURNAL.

This letter is not intended as a brief for improperly constructed wood tie track nor in favor of its use under certain exceptionally poor subsoil conditions. There are and always will be exceptions to all rules. There are times when it is necessary to choose between two evils, and naturally the lesser will be selected.

Generally speaking, however, stone-ballasted track built with pressure-treated creosoted wood ties properly spaced, with a rail suitable for the traffic and with joints welded according to recognized good practice, will give excellent results. The secret of its success lies in the proper preparation of the subgrade, selection of proper kind of stone ballast and grading of same and thorough tamping of the ballast under the ties, taking care to see that in removing surplus ballast from between the ties before placing the concrete the ballast is not disturbed below the bottom of the tie.

A source of frequent trouble is the fact that some engineers think any mixture of stone, sand and cement is good enough for a track structure. Such is not the case, and it is just as important that properly proportioned and properly mixed concrete be used in the track structure as in any other.

The next item is in the selection of the type of pavement and the details of its installation. It is quite generally admitted that the ideal type of pavement for street railway track, and the most economical in ultimate cost, is the best quality of granite that can be obtained, and it is also becoming more and more generally recognized that an asphalt mastic filler provides the best seal against the passage of surface water to the track substructure and at the same time materially reduces noise from car operation.

A track such as described above will, under ordinary subsoil conditions, give many years of satisfactory service and has the additional advantage of offering a maximum salvage value when the necessity to rehabilitate the track arises.

Mr. Irwin makes the following statement in his paper, to which the writer desires to take exception: "There is *only one reason* why railroad track gets out of surface, and that is that the foundation is not strong enough to support the loads put upon it. In other words, track construction is not given anywhere near the stability that is demanded for a bridge or a building of even a minor character. The fact that the rails of a car track become low with respect to the adjacent pavement surface *proves just one thing,* that there is an inadequate engineering structure supporting those rails."

Barring from the discussion the exceptional conditions previously admitted, railroad track also gets out of surface because the subgrade was not properly compacted in the first place, because the ballast was neither properly graded nor tamped, because surface water has been permitted to reach the subgrade and not properly drained off, because of the effect of excavations under the track by other utilities, because of settlement caused where large sewers or other underground structures under the track area frequently prove defective, and other similar conditions.

Regarding what may be proved by the fact that street railway rails sometimes become lower than the adjacent pavement, the writer has frequently seen instances of rails lower than the adjacent pavement, due to the action of frost heaving the adjacent pavement and not to any settlement of the rails. I have also seen many instances of where such adjacent pavement was originally laid higher than the street railway rails and against the protest of the street railway representatives. So it is evident that the condition cited by Mr. Irwin may prove any one of several things, rather than "just one thing."

In discussing rigid versus resilient track construction, it might be well to consider briefly what takes place in a track structure. Unless a rail is absolutely uniformly supported throughout its entire length it will deflect between supports under a wheel load. That a rail is not so uniformly supported, even in so-called rigid track, must be admitted; therefore, there is a deflection, whether appreciable, as in open track, or relatively small, as in paved track. This deflection moves along as a wave in the rail as the wheel advances. Anything that is done to interrupt or prevent this wave motion is going to create unusual stresses in some part of the track structure. If you try to restrict it entirely by building so-called rigid track (concrete beam or steel tie and concrete construction), it will sooner or later be found that ties have been deformed at the rail bearings, rail fastenings have failed or the concrete under the rail base has become pulverized. By restricting the wave motion, excessive internal stresses in the rail and its joint have been formed which usually aggravate the occurrence of rail corrugation and joint troubles and make a noisy track.

Many engineers have found out through costly experiments during the past 25 years that rigid track is not the cure-all for street railway track ills and have gone back to a type of construction with wood ties substantially along the lines indicated at the beginning of this communication. It is a well-known fact that an anvil is always mounted on a resilient base, and if this were not so the life of the anvil would be short. A track structure is subjected to very much the same kind of stresses as an anvil, and the theory which holds true for the anvil is equally good for the track structure.

HOWARD H. GEORGE,
Chairman Committee on Way and Structures, A.E.R.E.A.

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Lewis C. Mayer Wins July Prize

Anti-creeping anchors for double-track crossings receives $25 monthly prize for July in the *Electric Railway Journal's* maintenance competition. Honorable mention given to Louis T. Botto for description of "Keeping Paving in Good Condition with Little Money" and to Angus G. Scott for description of "Trolley Reel for Emergency Trucks"

THE problem of keeping steam road crossings in line is one of the most difficult experienced by electric railways. It is usually the electric railway alignment which suffers most, and the ordinary anti-creeper devices employed by steam roads do not, as a rule, solve the problem satisfactorily. The method described by Lewis C. Mayer in providing anti-creeping anchors for double-track crossings was considered as offering a real suggestion to track maintenance men which can be used on other railway properties to advantage, and this was given the $25 monthly award by the judges. The method described stood a test of three years on some crossings of the York Railways with a steam line and seems to have solved the problem satisfactorily. The design of anti-creeping anchor described should be comparatively easy to apply to any section of railroad at a reasonable expenditure.

The method for keeping paving in good condition with little money described by Louis T. Botto is a simple expedient which has produced good results at small cost. If the various kinds of defects in pavements are not repaired at the beginning, they soon become a serious problem, with the final result of making it necessary to lay new pavement. The item of paving repairs is a large one and any method of cutting this cost is a great benefit to the industry. The judges of the twelve articles published in the Maintenance Data Sheet section of the ELECTRIC RAILWAY JOURNAL for July 16, 1927, decided that honorable mention should be divided between the method described by Mr. Botto and and the item "Trolley Reel for Emergency Trucks" submitted by Angus G. Scott.

The trolley reel offers a most ingenious and practical arrangement for handling trolley wire and the braking device to provide the necessary tension in the wire while stringing is also to be commended. It should facilitate the entire operation and can be adapted to practically any city property. The usual practice of electric railways is to carry a coil of trolley wire on the side of the tower. This is very awkward to handle, and if but a few sections of wire are to be run in, the method described of carrying the wire is simple and facilitates greatly its erection.

Competition for the July prize was very close. Twelve articles were published in the Maintenance Data Sheet section of ELECTRIC RAILWAY JOURNAL for July 16, 1927. Additional items appear in the following pages. One of these will be awarded the $25 monthly prize for August. With this installment 42 of the items submitted in the maintenance contest have been published. There still remain more than 60. These will be published as fast as space permits. All are being turned over to the judges and an early decision will be reached in awarding the capital prizes of $200, $100 and $50, the winners of which are to be announced in the annual convention issue of the ELECTRIC RAILWAY JOURNAL, to be published Sept. 17, 1927.

The contest is still open for articles to be submitted for the monthly prizes. These may be sent in any time up to April 30, 1928. Full information regarding the rules of the contest was given in the April 16, 1927, issue of ELECTRIC RAILWAY JOURNAL, pages 700 and 701, and condensed rules and instructions for the contest have been published many times since then. Contestants should read the rules carefully in order that they may comply with all conditions.

Lewis C. Mayer

THE WINNER of the July prize, Lewis C. Mayer, has been chief engineer of the York Railways, York, Pa., since 1903 and has had the added duties of vice-president since 1909. This railway operates 85 miles of city and suburban electric railway and Mr. Mayer has full charge of the location, design, construction and maintenance of the track, overhead lines, central power stations, substation buildings, carhouses, shops and yards.

His experience on track construction work began in 1892 with the Pittsburgh division of the Baltimore & Ohio Railroad. For six years he was rodman, transitman and draftsman in general maintenance work of this railroad. Then he served on relocation and construction work for the Pittsburgh & Western Railway, and in 1899 began similar work for the Tennessee Central Railway. Mr. Mayer's electric railway experience began in 1901 as assistant engineer to R. B. McKinnon, practicing engineer on location, design and construction of city, suburban and interurban electric railways. Mr. Mayer received his education in the public schools of Baltimore, where he was born, and later at the University of Kansas.

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Electric Railway Journal Maintenance Data Sheet

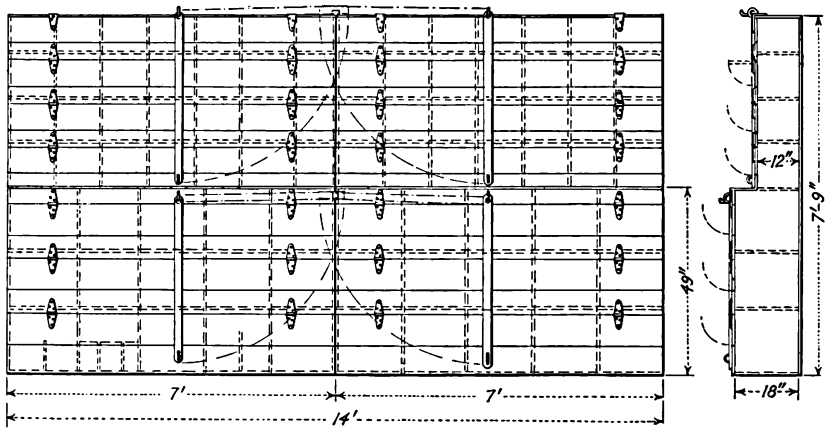
ROLLING STOCK—MACHINE SHOP—4

Bins for Pipe Fittings*

By J. B. Blaiklock
Master Mechanic Washington Railway & Electric Company

IN ORDER to give the workmen ready access to all pipe fittings and at the same time have them stored neatly the Washington Railway & Electric Company, Washington, D. C., has installed wooden bins at the pipe bench, as shown in the accompanying sketch. The bins are 12 in. x 10 in. x 10 in. on the upper section and 12 in. x 18 in. x 15 in. on the lower section.

Fittings are arranged horizontally by types, each different size being kept in a separate bin. Where the fittings are small the bin is divided into two sections by a small partition. The size and kind of fitting are marked plainly on the outside of the lid of the bin. Lids are hinged at the top and are locked shut by means of an iron bar 1½ in. x ⅜ in. This bar is hinged at the top and locks into a staple at the bottom with a padlock. The bar can be rotated and held open in a horizontal position by means of a small iron bracket which is fastened to the top of the bin with the ends of the bars resting on the bracket.



Parts of bin for pipe fittings as used by the Washington Railway & Electric Company

*Submitted in Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

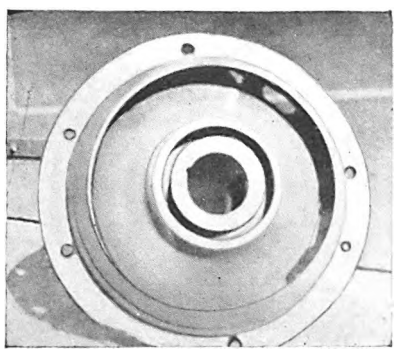
ROLLING STOCK—ELECTRICAL—21

Building Up and Remachining Armature Bearing Housings*

By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

SOME time ago we experienced difficulty with worn bearing fits in GE-258C motor pinion end armature bearing housings. As this type of motor is provided with ball bearings, it was necessary to replace the frame head or devise some way of bringing the bearing fits back to the manufacturer's standards. An attempt was made first to build up the bearing fit in the frame head by electric arc welding and then remachine it. As the amount of wear was small, it was found that a good job of machining could not be obtained, as the metal was too thin.

Bearing fits in frame heads were then counterbored to a diameter



Armature bearing housing built up by arc welding and remachined

⅛ in. larger than standard and the frame head at the bearing fit was heated with a large gasoline blow torch so as to get all oil and other impurities out of the metal. The bearing fit in the frame head was then built up by electric arc welding, making certain to add sufficient metal so that a smooth job of machining could be obtained.

The results were satisfactory and this practice is now being followed for all our box frame motors, which include GE-201G, 203A, 247B and 258C. All bearing fits are kept to manufacturer's standard and considerable expense of replacing frame heads is prevented.

*Submitted in Electric Railway Journal *Prize Contest.*

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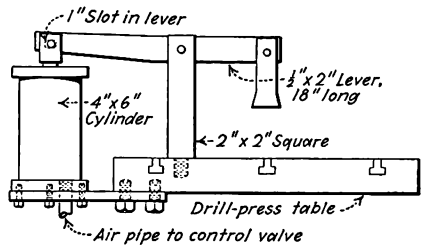
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MACHINE SHOP—5

Air Clamp for Drill Press*

BY CHARLIE HERMS
General Foreman Fifteenth and L Streets Shop, San Diego Electric Railway, San Diego, Cal.

AN AIR clamping attachment has been added to the table of a 22-in. drill press in the shop of the San Diego Electric Railway which has produced a saving of at least 10 per cent in drilling time as compared with the previous method used. Previous to the installation of this clamping attachment bolts and C clamps were used for holding the work. The air clamp is instantaneous and positive in operation and work does not slip. Accidents are prevented with the new device, since the operator is protected, whereas with the old method when drilling odds and ends for miscellaneous jobs the operator was frequently tempted to hold some small part with his hand. This sometimes resulted in an accident.



Air-operated drill press clamp as used in the shops of the San Diego Electric Railway

We use two shapes for the holding jaws. One is flat for holding flat surfaces and the other a hollow jaw for holding round stock. The clamping mechanism is not pivoted to the drill press table, since the table is adjustable to the drill and, therefore, the whole assembly acts as a unit. A 4-in. x 6-in. cylinder is fastened to one side of the drill press table. The piston of the cylinder acts through a lever arm to furnish the desired clamping pressure.

For controlling the air a General Electric Company's type "S" straight air valve is mounted alongside the air cylinder on the drill press table. The air connection from the shop supply is made by means of a flexible hose and carries 80 lb. of air.

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—22

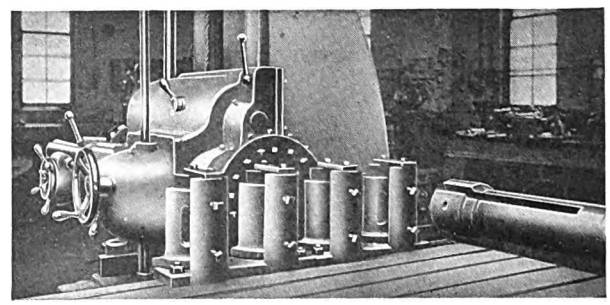
Inserted Tool Milling Cutter for Finishing Axle Bearings*

BY EQUIPMENT DEPARTMENT
Georgia Power Company, Atlanta, Ga.

DUE to a decrease in the size of wheels used from 33 in. to 26 in. and to an added amount of equipment, our axle bearing work increased beyond the capacity of the shaper used for finishing. Axle bearings operating with 26-in. wheel equipment have shorter life than have those with 33-in. wheels due to the higher accelerating speed and the increased axle speed.

To take care of the increased work we designed and built a multi-tool milling cutter and jig for use with a horizontal boring mill. Eighteen tool steel cutters are inserted through a disc and are held in place by set screws. The use of this large number of cutting tools allows increased speed with less work per tool.

The jig for holding the bearings consists of a cast-iron frame bolted to the table of the boring mill. Axle bearings are slipped into the jig against a vertical leg having a radius of the bearing. Set screws in the back of the frame are tightened against the back of bearings so as to clamp them securely. Four half bearings are faced at one time. After the carriage has run out in one direction it is reversed so as to mill another set of bearings on its return.



Set-up for finishing axle bearings on horizontal boring mill with inserted tool milling cutter

A complete bearing, that is two halves, were faced on the shaper in 30 minutes. This includes the time for setting up. It requires but eight minutes on the boring mill with the new method, which is a saving of 22 minutes, or 73.4 per cent increased production.

*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.

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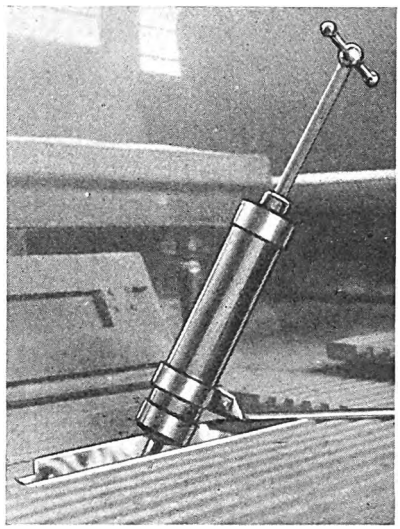
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—13

Grease Gun for Gear Lubrication*

By C. W. Wood
Master Mechanic Virginia Public Service Company, Hampton, Va.

GREASING of gears is no longer guesswork in the shop of the Virginia Public Service Company. A grease gun similar to the Alemite gun, but larger, is used. This is made of a piece of 3-in. iron pipe, fitted with caps on each end. One cap is drilled and tapped for a §-in. screw and the other for a ¾-in. pipe. The screw has a "T" shaped handle and cup leather plunger.



Gun in position for greasing gears through car floor

The gun holds several pounds of grease, so that it is possible to grease a large number of gears with each filling. After ascertaining the number of turns per pound, the exact quantity of grease desired may be inserted with ease. The gun is fitted with a bracket which rests on the car floor and is held in position by the foot of the operator. The accompanying illustration shows it in position.

*Submitted in Electric Railway Journal Prize Contest.

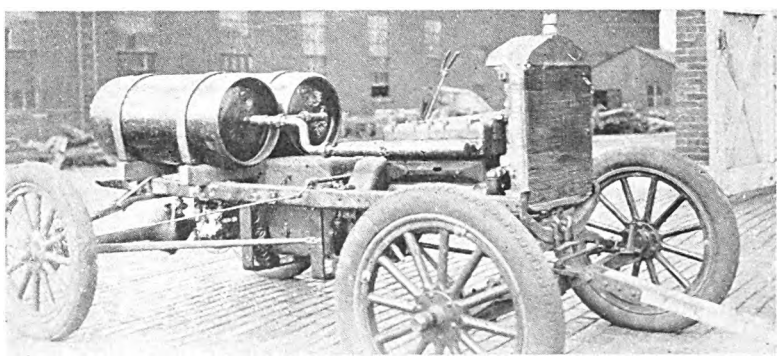
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—7

Compressor Made from Roadster Engine*

By N. E. Ferguson
Superintendent Railway Circuits West Penn Railways, Pittsburgh, Pa.

DUE to the rough country in which track repairs are made on the lines of the West Penn Railways, an air compressor of extreme portability was required. From an obsolete type 5½-hp. 600-volt compressor motor and a scrap Ford roadster equipment was constructed that would furnish an air delivery of 40 cu.ft. per minute which is about one-third that of heavy-duty commercial compressors.



Ford engine used as part of electrically driven compressor

The engine of the roadster was left in its position on the chassis with the fan assembly and radiator for cooling purposes, but the body, transmission gears and magneto were removed together with the camshaft and exhaust valves. Check valves were installed in the exhaust ports and these were connected to a common manifold, which in turn was connected directly to two air compressor tanks.

The head of the Ford motor was removed and was filled to a close clearance with Babbitt metal in order to increase the compression. The 5½-hp. compressor motor was connected directly to the crankshaft of the Ford engine. This motor operated the Ford engine at 750 r.p.m. and was governed by an automatic device that connects or disconnects it from the trolley as the pressure falls and rises.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

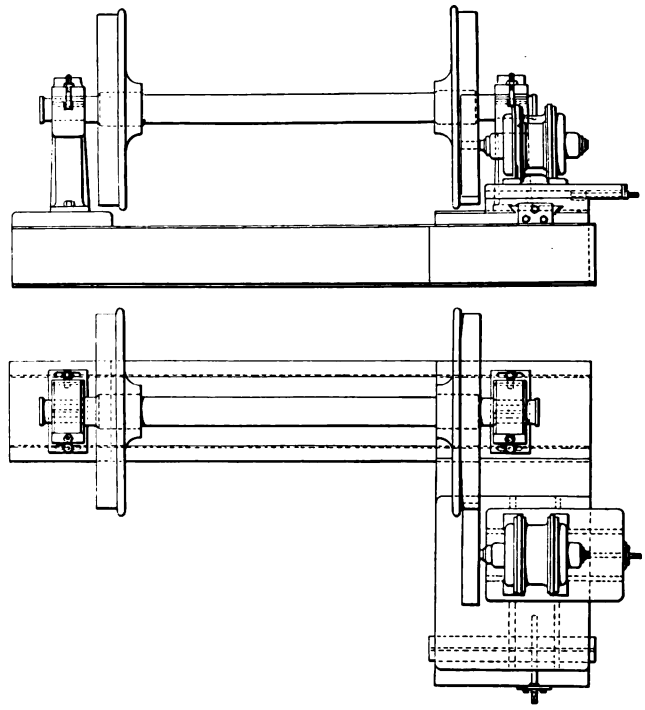
ROLLING STOCK—TRUCKS—14

Grinding and Welding Wheels at the Same Time*

By J. A. Duffy
Superintendent of Equipment Monongahela West Penn Public Service Company, Fairmont, W. Va.

BY MEANS of the special machine shown in the accompanying illustration steel wheels are ground while the automatic electric welder is in operation building up the flanges. By this arrangement one man can grind wheels, weld them with the automatic head and at the same time do hand welding. This method of grinding and welding at the same time eliminates the wheel lathe and speeds up the work considerably. A saving of about three hours per pair of wheels in machinist's time has resulted.

The grinding wheel is the width of the tread of the steel wheel, and while welding up the flanges on one wheel the opposite wheel is being ground. The special shaped grinding wheel shapes the flange properly. A variable speed motor is used to drive the wheels. The speed is 900, 1,200 and 1,800 r.p.m. connected to a speed gear reduction box which gives 5, 7 and 13 in. of periphery speed per minute. The machine and gear reduction box were made in our shop.



Machine arranged to hold a pair of wheels while building up flanges and grinding

*Submitted in Electric Railway Journal Prize Contest.

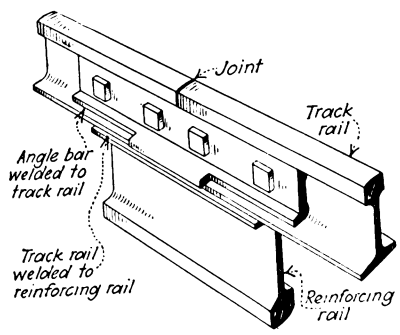
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—8

Scrap Rail Used to Reinforce Joints*

By Louis T. Botto
Superintendent Maintenance of Way San Antonio Public Service Company, San Antonio, Tex.

DURING the past year the maintenance of way department of the San Antonio Public Service Company has rebuilt 3½ miles of gravel ballast track. A rail joint made of an 18-in. length of scrap rail and an old pair of 60-lb. angle bars cut out at the end to make up the joint has proved particularly beneficial as well as cheap. The scrap rail was inverted, placed immediately under the joint and welded to the running rail, which in turn was welded to the angle bars.



Joints on track reinforced by using old rail

Prior to the use of this method joints in track required raising after each heavy rain. This was very expensive from a maintenance standpoint. Since the installation of the new joints no more work has been done on them and the track has held up well.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—9

Circuit Breaker and Hand Brake Provide Car-Backing-Up Device*

By L. Tait
Manager London Street Railway, London, Ont.

DUE to increasing auto traffic and because the London Street Railway, London, Ont., turns cars at Y's on several of its lines, some plan to back up single-end safety cars from the rear was desirable. The plan adopted includes the installation of a circuit breaker and hand brake at the rear of the car. A National Brake Company's Peacock staffless brake was placed between the back cross seat and the small seat on the side of the car so that no seating space was lost. The circuit breaker was installed directly above the hand brake on the side of the car.

Wiring between the front of the car and the rear circuit breaker is carried through the roof and along the top of the car in conduit. A knife switch on a slate base inclosed in a wooden box is placed on the side of the car to the left of the controller. This switch is connected at the top terminal to the front circuit breaker and the bottom terminal to the controller. The bottom terminal also has a wire connection through the conduit to the circuit breaker at the rear. The accompanying diagram shows the connections.

To operate a car from the rear end the knife switch is opened and the controller handle is placed in the first running position, the deadman release being hooked down, and the reverse handle in position for backward movement. The car can then be operated from the rear by closing the circuit breaker with the left hand and operating the hand brake with the right hand.

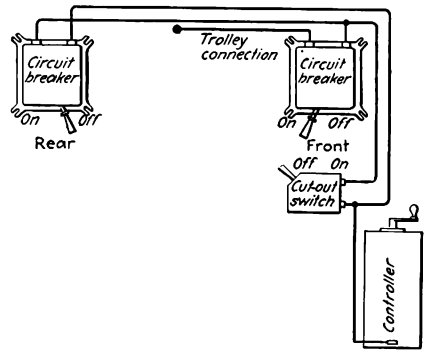


Diagram of circuit breaker and cut-out switch for back movement of single-end car

*Submitted in Electric Railway Journal Prize Contest.

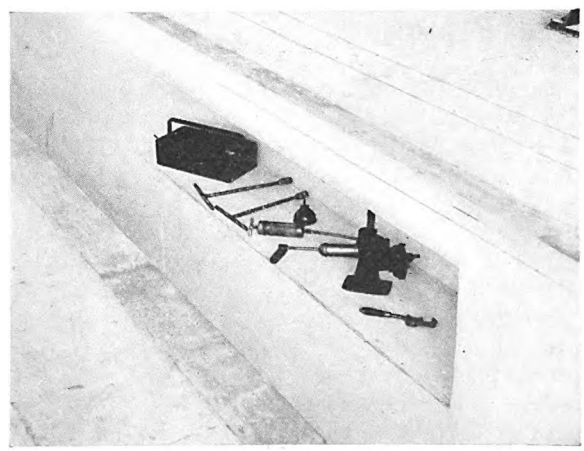
Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—5

Recess Provided in Bus Pit for Tools*

By C. B. Lindsey
Superintendent of Automotive Equipment Los Angeles Railway, Los Angeles, Cal.

PROVISION of a recess in the side wall of depressed pits which are a feature of the new automotive repair shop of the Los Angeles Railway is of great convenience. Mechanics place all tools used in doing any repair job on buses or other automotive equipment in these recesses. Formerly many tool boxes, grease guns, etc., were damaged when, inadvertently, they were left on the edge of the pit, where the bus wheels ran over them.



Recess in wall of bus pits for workmen's tools

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

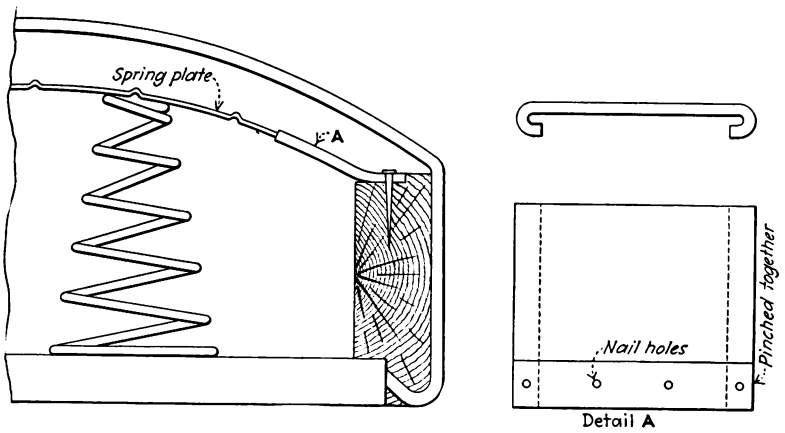
ROLLING STOCK—MISCELLANEOUS—10

Repairing Rattan-Covered Seat Springs*

By Tom Standard
Seat Repairman Omaha & Council Bluffs Street Railway, Omaha, Neb.

RATTAN-COVERED street car seat cushions have given trouble on lines of the Omaha & Council Bluffs Street Railway, as the flat spring plates break near the ends. When this occurs the seat becomes hard riding and the broken spring plates gouge holes in the rattan covering.

In the method of repairs used in the shops of the railway the roughly broken end of the spring plate is first cut square. A square piece of sheet steel which has been previously shaped to fit over the spring plate is slipped over the squared end, while the other end of the sheet steel is nailed to the seat frame. The spring plate is thus spliced and a sliding joint is provided.



Method used in repairing broken seat spring plates

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—6

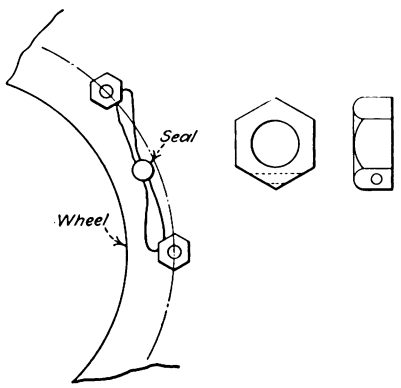
Simple Method of Keeping Accurate Bus Tire Records*

By Glenn S. Reeves
Assistant Master Mechanic Omaha & Council Bluffs Street Railway, Omaha, Neb.

SEALING of wheels is used for keeping bus tire records in the bus department of the Omaha & Council Bluffs Street Railway. Mistakes are eliminated in reporting the numbers of the tires removed and applied and the wheel location and the speedometer reading is given, which data are usually taken at the time tires are changed. Responsibility for reporting tire changes correctly is not divided and there are no conflicts in tire data when the tire mileage reports are made out.

A seal is put on the wheel which must be broken before the tire can be removed. When a seal is found broken the tire number on this wheel is recorded on the daily bus report. In the case of a dual rear wheel both tire numbers are reported.

The night inspector each night checks each wheel for broken seals. His report goes to the office clerk, who then records the change on the office tire record cards which show where each tire was before the change was made. If a report shows a tire of a different number on this wheel the clerk knows which tire has been removed and which tire has replaced it.



Method of sealing bus tires as used by the Omaha & Council Bluffs Street Railway

*Submitted in Electric Railway Journal Prize Contest.

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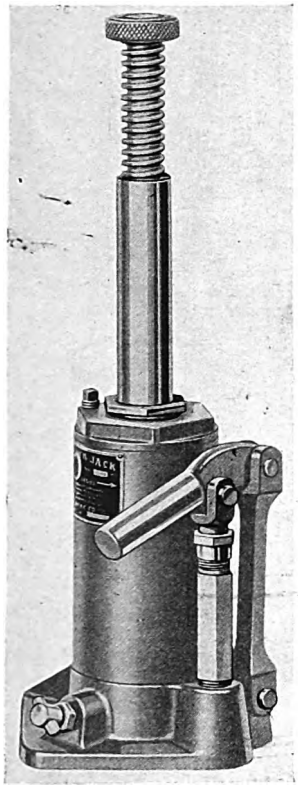
Hydraulic Oil Power Jacks Improved

HYDRAULIC oil power jacks, improved and standardized after five years of testing, are being introduced by the Blackhawk Manufacturing Company, Milwaukee, Wis. Improvements provide a simplicity of the operating mechanism with lifting power far beyond rated capacity. A twin check valve unit is located below the pump in an accessible position where removal for cleaning or replacement requires but a moment. A long bayonet-grip handle holds and places the jack at long range. Short strokes raise the ram with positive lift and hold it in position. Lowering is done automatically with the control release valve, the speed being governed by the operator. The handle is used to open the release valve for lowering, to control the drop and to withdraw the jack. It can be used in a horizontal



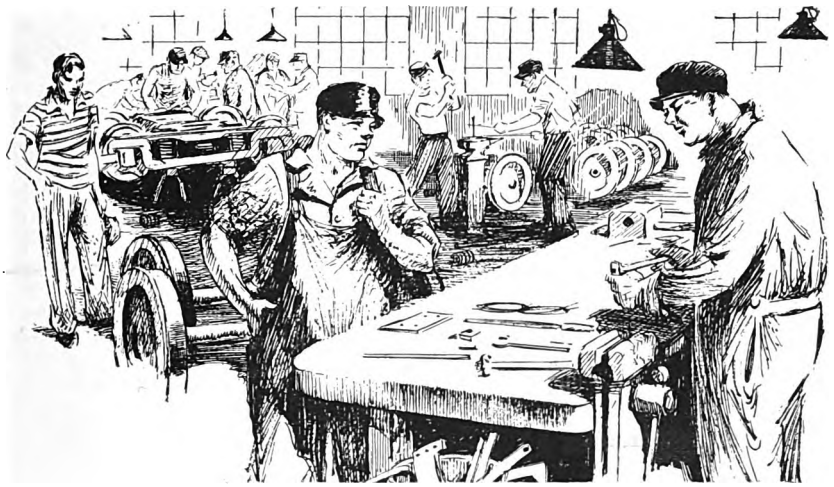
This jack has a capacity of 7 tons and a lift of 5¼ in. It weighs 15 lb.

position for forcing operations provided the jack is operated with the pump side down.

The complete line of Blackhawk hydraulic oil power jacks includes ten models in nine capacities. The automotive models embrace single and double lift models, light and heavy duty, low and high built jacks and floor-lift jacks.

Dick Prescott Awaits Developm ents

and Shorty Green Does Some Thinking



DICK PRESCOTT, assistant superintendent in the Consolidated Railway & Light Company's shop, had decisively won the first skirmish with the disgruntled men in the truck shop. He felt that he had used good judgment in meeting the situation openly by calling for a showdown from the ringleaders before the other men. He had, of course, taken chances in following that procedure. But when none of the men answered his challenge to accept individual responsibility for the disaffection, he knew that he had won a strong moral victory, which would have an immediate effect on the rank and file of the workmen in the shop.

Every man, no matter how limited his judgment, instinctively recognizes and admires a good sport. That the young assistant superintendent, even though somewhat lacking in experience, was a "square shooter," as the men would say, was quickly evident to every one of them after Dick had confronted the entire group. Even Shorty Green, henchman of Pete Welcher, the envious shop inspector, who had sworn to "show up" the young assistant superintendent, began to feel some doubts after Dick had dared him to step out of the crowd and state his grievances. Shorty had only seen Dick in the shop as he went his rounds and had never spoken to him. He had accepted without question and without personal knowledge Steve's appraisal of Dick as an upstart and a four-flusher. But now, as Shorty soberly reflected the morning's incidents, he realized that the assistant superintendent was a far different individual than Pete Welcher had pictured him.

"That guy ain't no dub," reflected Shorty Green. "He won't stand no foolin' and all that, but he'd give a bird a square deal. I'm kind of sick of listenin' to Steve's line of guff anyhow. Dat guy's goin' to get fired if he don't watch his step, and what good is it goin' to do to stick my head in a sling? I've been ridin' for a fall and not knowin' it."

While Shorty Green was thus indulging in unpleasant reverie, Dick Prescott, back in his office, felt none too comfortable. Of course he had won a temporary victory, but he knew that the matter was not settled, and he wondered how far the dissatisfaction penetrated among the men and just what was the explanation for the morning's outbreak. The thought of personal jealousy because of his own rapid progress did not enter his mind. Dick felt that he had worked hard for his advancement and that every one in the shop would recognize that favoritism or "pull" had nothing to do with his progress.

Thus the morning wore away without particular incident, and as the noon hour approached, Dick wondered what would happen. He had invited the men to select a committee of three to call on him with their grievances.

It was only a few minutes before noon when Shorty Green walked over toward big Pete Thompson, the man who had suggested they go back to work.

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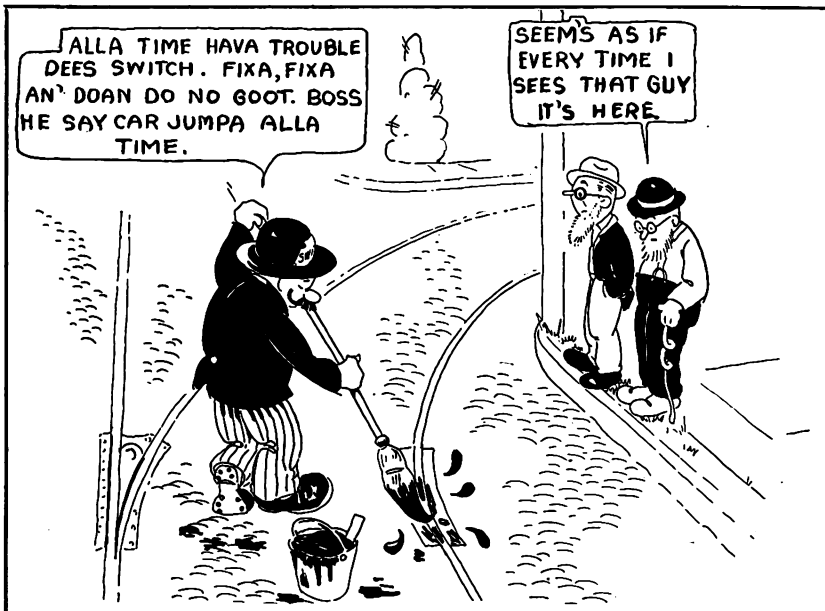
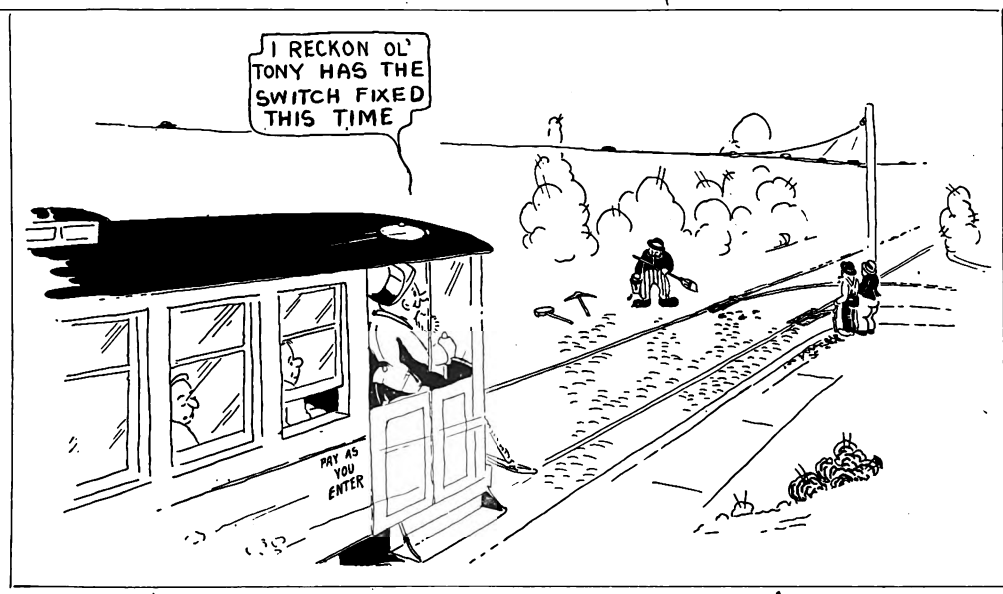


Adventures of Old Man Trouble

on the Hicksville Railway

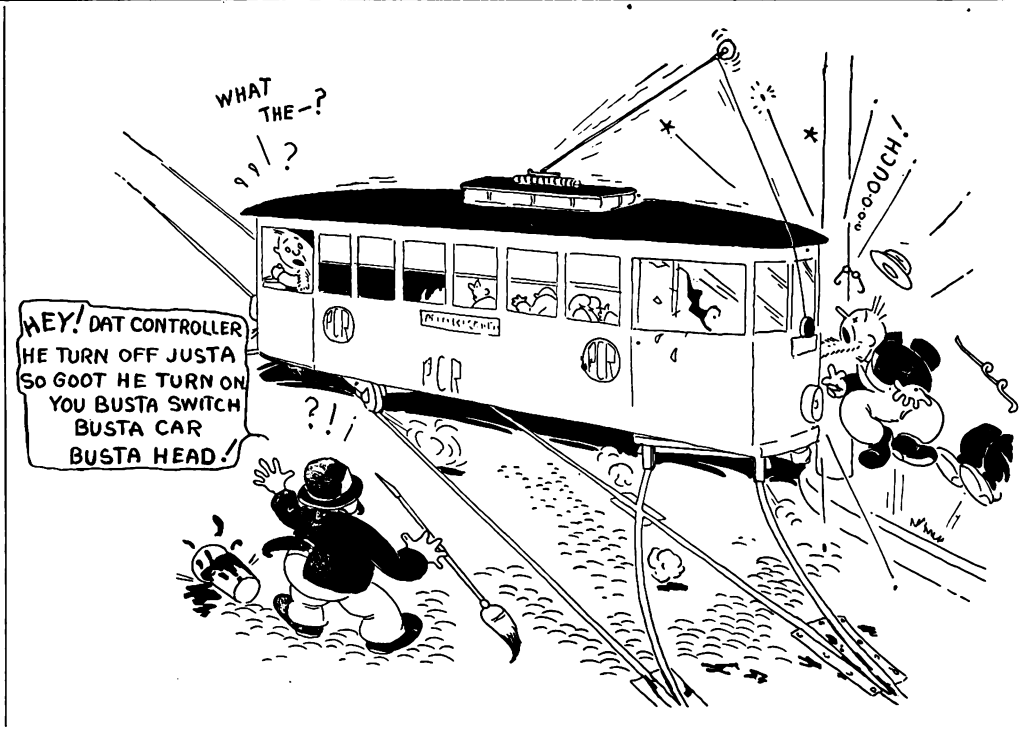
Even though switches are maintained in time

Only a reckless motorman tries to cross on "Nine"



Disastrous traffic tie-ups can be traced both to careless maintenance of switches and to careless operation of cars. Regardless of how well special work is maintained, a careless motorman can do much damage to this expensive construction and to the car he is operating. Slower speeds across switches will reduce switch maintenance, reduce tie-ups and increase safety.

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.



J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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Association Activities

Attainable Average Speeds in City and Interurban Service*

By Dr. Friedrich Lademann
Operating Manager Berlin Street Railways

THE increasing surface congestion of traffic demands the greatest attention toward higher running speeds from the rail-bound vehicle. Factors that affect such running speed, regardless of layovers, are:

Character of special work, their curves and radii; elevation or lack of elevation at curves; possibility of parked reservations for trackways only; use of electric car-controlled or tower-controlled switches instead of hand, etc. The influence of track on speed has not received sufficient attention in the past. Its effect can hardly be overestimated.

On the other hand, the influence of stop spacing has been long appreciated. The answers to the data sheet reveal that the average stop spacing on 79 street railways is 375 m. (1,230 ft.) and on seventeen interurban railways 2,700 m. (8,856 ft.). The stop spacing on street railways could hardly be increased without lowering their value for short-haul riding.

Owing to the interference of foreign vehicles, particularly on busy streets, it is desirable to shorten passenger interchange time at stops by means of safety isles. A very favorable change has been made at Spittelmarkt, Berlin (a heavy traffic intersection), due to arrangements which permit simultaneous passenger interchange of several electric trains at different platforms.

The data sheet also developed that the average length of stop ranges from ten to 30 seconds. Berlin averages only fifteen seconds with its 3,000 stops, but efforts will be made to reduce the time still further.

Schedule speed in Germany is affected also by governmental regulations which fix the maximum free running speed as 30 km. (18.6 miles) per hour. The street railway, however, has within its own control such delays as are due to poorly arranged headways and the type of car or train used. Each operator must find for himself the correct relation between the speedier motor car and the cheaper trailer.

Last, but not least, speed is also affected by the character of car design and equipment. Rapidity of passenger interchange may be defined as a function of car capacity, the order of in-and-out movements, seat layout, center or end platforms, width of doors, heights of steps, joint or separate passages for entrance and exit, character of stop and start signals, etc. This class of items has made considerable progress in recent years, and their betterment can do much to accelerate traffic movement.

The type of current collector, rolling or sliding, also enters because trolley derailments must be considered a factor in the speed problem.

All the conditions mentioned heretofore lie within the control of the operator and are capable of improvement by him to a certain extent. Other causes of delay are less controllable because they are due to the use of the streets by other vehicles, to street traffic signals and to various governmental regulations.

Since the public always prefers the fastest vehicle, the question of speed cannot be separated from that of competition. The least that the street railway car can do to win out against the motor bus is to equal the latter in speed.

Finally, the higher the speed the less the requirements in personnel and rolling stock.

There are a number of possible measures to be taken to secure higher speeds. These may be classified as "operating" and "regulatory," as follows:

1. Rerouting to decrease congestion at the heaviest points.
2. Parked reservations for street railways.
3. Limitation of stopping places and use of safety isles for passenger interchange, preferably in tandem. It is suggested in this connection that stops on main streets should not be directly at the intersections, but several train lengths back, from which locations the trains are better able to start with the "Go" signal.
4. Raise permissible maximum free running speed.
5. Analyze time-tables to secure most favorable headways on track used jointly by several routes.
6. Analyze service to determine most favorable operating combinations of single motor cars or of trains with trailers.
7. Improve car design.
8. Raise trolley voltage; increase rates of acceleration and retardation.
9. Improve the skill of the operating personnel.
10. Educate the public toward more skillful use of the facilities.

Regulatory Measures for Improving Speed

1. Retain the right of way for street cars.
2. Secure police regulations compelling other vehicles to halt on approaching a street railway stop in use. The present Berlin regulation merely calls for a 1 m. (3.28 ft.) detour or clearance from a standing car. The author recommends the full-stop practice of the United States.
3. Adjustment of traffic control signals to the conditions of street railway operation.

It has been reported here that the original use of synchronous signals in the United States had lowered street railway schedule speeds by 20 per cent, but this had been overcome by the co-ordinated system in which allowance was made for variations in the traffic of intersecting streets and for the customary speed of trolley cars.

About half a year ago the synchronous system installed on Potsdamer and Leipziger Streets, Berlin, caused a 30 per cent speed reduction in trolley cars. After fourteen days of this, change was made to a co-ordinated system based on a speed of 20 km. (12.4 miles) an hour. Not only did this restore the original schedules, but it made an increase possible. About 20 per cent of the automobile traffic left these main streets to use highways without traffic signal control, thereby affording further relief.

The number of automotive vehicles in Berlin has increased from 10,000 in 1925 to 50,000 in 1927.

Range of Speed on Routes of Berlin

In conclusion, the variation of speeds on various Berlin routes may be cited as examples of how outside conditions may control. The 89 routes in the city show a range of 11.8 to 17.4 km. (7.3 to 10.8 miles) per hour, exclusive of layovers. One route, a downtown belt, has the

*Abstract of paper presented before the Copenhagen convention of the Internationaler Strassenbahn- und Kleinbahnverein, June 22-24, 1927.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Sept. 1-3 — **National Electrical Manufacturers Association, Policies Division, meeting, Association Island, N. Y.**

***Sept. 1-4*—Tenth Annual Conference on Human Relations in Industry, Silver Bay on Lake George, N. Y.**

***Sept. 7-9*—American Society of Mechanical Engineers, Machine Shop Practice Division, first national meeting, Mason Laboratory, Yale University, New Haven, Conn.**

***Sept. 8-9*—Central Electric Railway Master Mechanics Association, Hotel La Salle, South Bend, Ind.**

Sept. 13-15 — **International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting, Book-Cadillac Hotel, Detroit, Mich.**

***Sept. 26-30*—National Safety Council, annual congress, Hotel Stevens, Chicago, Ill.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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lowest speed, although equipped in the most up-to-date manner. Another has the maximum speed, despite old equipment, because it is operated under suburban conditions.

Owing to the effort made along the lines indicated in the paper, Berlin's speeds had gone up 20 per cent in recent years. Nuremberg and several other cities had enjoyed like success. The minimum speed for cities of more than 1,000,000 inhabitants should be 14 km. (8.68 miles) per hour. Cities of that size either have or will have motor bus operation, so that the street railway cannot afford to be slow. Incidentally, it may be said that the Berlin motor buses average only 0.3 km. (0.186 mile) higher speed than the cars. "Speed" must be the watchword of the street railway which wants to retain its primacy in city service.

Decreasing the Cost of Way Upkeep*

By Nicolai Hansen
Chief Engineer Copenhagen Tramways

THE importance of way upkeep can be measured by the fact that it equals 30 to 40 per cent of the total operating expenses. At Copenhagen this includes the obligation to pave between the rails and for 0.628 m. (2 ft.) on each side thereof. The character of paving is determined by the city. At present 42 per cent of the 185 km. (114.7 miles) single track is in asphalt or granite block on concrete base.

The main resource left to the way engineer is to find means for reducing the upkeep cost of these undesired constructions. Improvement of drainage, as by means of tile laid under the space between the rails, is of first importance, aside from caring for the run-off of the water that collects in the groove of the rail.

At Copenhagen water which seeps through the granite block and concrete paving is led to a sub-base of broken stone which is pitched toward the central tile drain. About 2.5 cm. (1 in.) of asphalt composition is poured around the rails. Pumping of the rails is minimized by installing two foundation bolts clamped to the rail base at intervals of 2.5 m. (8.2 ft.).

Changes which have reduced Copenhagen way maintenance costs are as follows:

The substitution of electric service cars for horse vehicles for 25 per cent of the material conveyed.

The use of Thode's automotive corrugation grinders in place of hand filing.

The installation, since 1923, of pneumatic hammers for breaking up concrete. With two hammers and three men this outfit does the work formerly requiring eight men.

Replacement, since 1923, of worn rail of 42 kg. (92.4 lb.) Phoenix section 25-B by sections 102-104 and 102a-104a standardized by the German Street Railway Association. These are stronger, cost less and require smaller stores investment because of quicker delivery. In a pinch, standard rails can be bought from or sold to other railways.

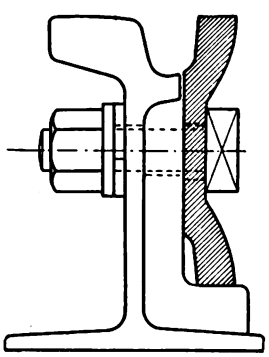
Thermit rail welding, in use since 1912, is considered ideal.

Standardization Permits More Manganese Special Work

In Copenhagen track on curves equals 15 per cent of the total. The special work comprises about 600 switches and 1,400 intersections. The maintenance of this special work amounts to 35 per cent of the total way cost.

Manganese special track work undoubtedly gives 2½ to three times the life of ordinary built-up work, but the cost of patterns for individual pieces is too high; in fact, it amounts to between one-third and one-half the entire cost. The economical application of manganese special work has therefore to be confined to busy intersections in expensive paving.

It follows that more extended use of manganese must depend on standardization. In this respect Copenhagen has made good progress. The 1,400 intersections have been divided into five classes. In Class I are 250 inserts for which only one pattern is needed; in Class II, involving curves and branch-offs, there are 448 inserts for which 48 patterns were required. It was practicable to standardize 80 per cent of the pieces in this group. In Class III 36 pieces called for thirteen patterns, but 64 can be handled with three patterns. In Class IV there are 268 pieces capable of standardization but used in service for which built-up work would be satisfactory. Class V, with 300 inserts in a diversity of branch-offs, was not readily standardized.



Copenhagen method of providing alloy steel guard for rail on curves

In general, where feasible, the use of standardized manganese has saved 25 to 40 per cent, the maximum saving occurring in asphalt.

The use of a portable electric welder to prolong the life of special work one to two years costs only 10 to 20 per cent of the replacement price of the special work.

The life of curves had been increased 100 to 200 per cent by using a guard rail of "Tornado" steel in which the lip of the running rail is first cut off, as illustrated. This construction has also saved 25 per cent of the paving expense because cheaper material can be used. The life of a guard rail of alloy steel exceeds that of the Phoenix 25-B running rail.

"In Situ" Rail Hardening Value in Doubt

The Sandberg "In situ" rail hardening process had been applied to about 4,000 m. (13,120 ft.) of Copenhagen track. The work was done by the railway forces with the equipment of the manufacturer. The latter guaranteed to make good within three months any damage to track or thermit welds.

On an average, three to four men in the four-hour night shift were able to harden about 8.5 m. (27.9 ft.) of track in an hour, the work being chiefly in concrete with asphalt paving except for wood filler block. The rails were either Phoenix 25-B or German Street Railway Association standard section No. 4.

To avoid breaks at the welds, in view of Copenhagen temperature range, the manufacturer suggested that no hardening be attempted for a short space on each side of a rail joint. The railway feared that this would result in soft spots or dishing, but so far this effect has been only faintly noticeable.

The tests proved that "In situ" hardening must not be attempted until the hard skin due to the rolling of the rail at the mills has worn off, and only if the thermit welds are perfect. On a 150-m. (492-ft.) stretch where defects were present 50 per cent of the welds broke. Only four broke on the remaining 675 m. (2,214 ft.), and of these two were defective before hardening began. There were also a few cases of minor cracks after the hardening process.

There were five rail breaks, three of which were due to faulty hardening. The cause of the other two breaks is unknown.

Backfire of the hardening flame is indicated by the frequent appearance of dark transverse stripes. These are sometimes accompanied by hairline cracks which are likely to develop into ruptures later. Many little transverse cracks are noted, particularly in the groove. These tend to spread and join, whereupon they may cause a light shelling. It is doubtful whether these cracks deepen.

The hardened portion may shell or peel in flakes on the head, or in shards or strips on the groove. One rail may be defective in this way while the adjoining length is free. Corrugation has not followed hardening. The track also seems to be less noisy than untreated rail.

Measurement of wear has been too scattered to be conclusive, but the management believes that resistance to wear is raised 90 to 100 per cent. However, the "In situ" process subjects the rail to a certain risk. As far as Copenhagen results go, there is no strong temptation to continue the work.

Abstract of paper read before the Copenhagen convention of the Internationaler Strassenbahn- und Kleinbahnverein (International Street and Interurban Railway Association), June 22-24, 1927.

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During 1926 the Copenhagen management ordered 2 km. (1.24 miles) of German *standard* section No. 102, surface-*sorbitized rail*, chiefly for curves on which the lip of the inner rail has been cut off for use with "Tornado" guard rail. The rest of this sorbitized rail is for straight track at places where wear is severe because of frequent stops.

Two-Day Meeting for C.E.R.A. Master Mechanics

SEPT. 8 and 9 the next meeting of the Central Electric Railway Master Mechanics Association will be held at the Hotel La Salle in South Bend, Ind. The first day will be occupied with a discussion of reports and other business of the association, and the second day, Friday, will be taken up with an inspection of the South Shore Railway shops. A special car will take the party to Chicago for this inspection.

N.E.M.A. Policies Division Meets Sept. 1-3

THE program of the coming meeting of the Policies Division of the National Electrical Manufacturers Association at Association Island, Sept. 1-3, will center around three subjects: economics, commercial development, and competitive relations.

Addresses will be delivered by Prof. Thomas N. Carver of Harvard University; Magnus Alexander, president of the National Industrial Conference Board; C. L. Collens, W. E. Sprackling, Leonard Kebler and W. G. Merritt.

American Association News

More Foreman-Conference Registrants

REGISTRATIONS for the training course for foreman-conference leaders to be held at Cleveland, Oct. 3 to 8, continue to come in. In addition to the list of twelve men published in the Aug. 6 issue the following names have been received:

W. H. Becker, instructor Pittsburgh Railways.

D. D. Brimhall, supervisor Utah Light & Traction Company.

R. Z. Burns, superintendent of school, Pittsburgh Railways.

W. E. Ford, superintendent road construction Pittsburgh Railways.

H. R. Horton, mechanical engineer Pittsburgh Railways.

T. J. Madden, instructor Pittsburgh Railways.

Mack E. Murphy, instructor Pittsburgh Railways.

E. B. Stover, assistant to assistant general manager Chicago, South Shore & South Bend Railroad.

E. H. Tingley, secretary National Association of Foremen.

The Cleveland Railway also will have several representatives in the course.

Luncheon Conferences Announced

FOURTEEN "Round Table Luncheon Conferences," each devoted to a subject of major interest, and each limited to an attendance of 50, will be a feature of this year's convention at Cleveland. The luncheons will be strictly informal, with no set speeches or papers. Only cross-table questions, expressions of opinion and exchange of practical experience will be included.

This will be an unusual opportunity to find out what other operating men have done, what they think about any particular problem, and an opportunity to give others the benefit of experience accumulated in successfully working out the subject problem. There will be an opportunity for younger and older executives and small-property and big-property executives to get acquainted and to profit by a better understanding of common and peculiar problems and advice on how to tackle them. The leaders of the industry have promised to be in attendance at the luncheons. An executive especially qualified on the subject will act as sponsor at each conference.

The Round Table Luncheon Conferences will begin at 1 p.m. and continue until 2:30, or as long as interest holds attention for those who do not have other afternoon engagements. Affiliated association meetings will not start until 3 p.m.

Those who wish to attend should send check for tickets desired, at the rate of $2 for each luncheon, to J. W. Welsh, executive secretary.

Choose Your Luncheon

TUESDAY AT HOLLENDEN HOTEL

No. 1—Traffic Regulation
No. 2—Taxes
No. 3—The Motor Bus
No. 4—The Trend in Franchises
No. 5—Developing Sales Instinct in Platform Employees
No. 6—Advertising—to Increase Riding; to Improve Public Relations

WEDNESDAY AT CLEVELAND HOTEL

No. 7—Cars—What Is Being Done and Results
No. 8—The Problem of Financing
No. 9—Public Relations
No. 10—Bringing City Service Up to Date
No. 11—The Valuation Question
No. 12—Trend of Fares
No. 13—Employee Relations (a closed meeting)

THURSDAY AT STATLER HOTEL

No. 14—Opportunities and Prospects for the Interurban

President Proctor Appeals to Claims Men

PRESIDENT PROCTOR is endeavoring to secure good attendance of claims men at the Cleveland convention. Accordingly he has written the following appeal for publication in ELECTRIC RAILWAY JOURNAL:

"This year we convene at Cleveland, Ohio, Oct. 3. I wonder how many claim agents other than the 'Old Guard' have seriously considered the advisability of attending the convention; not only attending themselves but bringing their chief surgeons and attorneys.

"Our program has been arranged by outstanding men in our field and contains subjects of great interest to claim agents, surgeons and attorneys. The papers and discussions will be both interesting and instructive. Much new blood has been injected. Many new faces will appear on the floor. One special feature will be an informal luncheon and round-table discussion, Wednesday, Oct. 5, at which all attending will be asked to bring up any subject in which the speaker is interested.

"The joint meeting of the Traffic and Transportation Association and Claims Association on Oct. 4 will be of interest to both, as subjects of mutual interest will be discussed. Your officials will endeavor to make the 1927 convention a record breaker, both as to attendance and interest. We need your help and think we can help you.

"Your absence and the old excuse of lack of interest on the part of your manager will not do. When you have failed to attend, was it not on account of a lack of interest on your part? Your manager cannot be expected to be interested unless you interest him; until you show him where the company will get a return on the investment. Of course, he is not interested merely to give you a vacation at the company's expense. It is up to you to show him the benefit to be derived from the meeting, rubbing elbows and discussing your problems with men who have had the same troubles as yourself, men who can give you a new slant on things, who can give you new ideas, who will send you back better equipped to tackle your job and cut down your per cent of gross earnings expended for claims. To make this convention what it should be a large attendance of its members is necessary.

"There will be no advance publication of papers. That makes your attendance all the more necessary. Otherwise, you will know nothing of the proceedings until the minutes are published. Furthermore, the personal contact is necessary if we are to derive any benefit the one from the other.

"Now I beg you to be with us this year. Help us by your presence and participation in the proceedings. We, on our part, will do our best to help you. Make your reservations early. There will be a big crowd. Here's hoping to see you all in Cleveland.

"C. B. PROCTOR,
"President American Electric Railway Claims Association."

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News of the Industry

Higher Fares to Be Sought in Ottawa

The Ottawa Electric Railway, Ottawa, Canada, has formally notified the city that it proposes to make application for an increase in fares for the five years beginning Aug. 14, 1928. Instead of a 5-cent fare, as now provided in the agreement, the company proposes a 7-cent fare or four tickets for 25 cents for adults, from 6 o'clock in the morning until midnight. For children, instead of the 3-cent fare, the company proposes a 4-cent fare or seven tickets for a quarter. No change is suggested for the after midnight fares, 10 cents cash.

Under the agreement with the city, the company was required to give notice of any application for increased fares before Aug. 14 this year. The application will then be made to the Dominion Board of Railway Commissioners. The agreement, as regards fare, provided 5 cents for the first five years, and for the second five years any increase would have to be approved by the Railway Commissioners.

Back in 1923 the city called into consultation Robert M. Feustel to investigate the railway problem. In his report to the Council, Mr. Fuestel recommended a number of extensions to existing lines, opening up new districts, and also prepared an estimate of earnings in the years immediately ahead. The company's franchise was extended upon the understanding that it would carry out the suggested improvements. This was agreed to, although at the time no reference was made to an increase in fares to take care of these extensions, a 5-cent rate continuing to the present.

During the past year or two, the railway has spent more than $2,000,000 in carrying out its part of the program. It is now claimed by the city, however, that proposed improvements are not up to schedule and there is evidently a concerted move to make the company grant further concessions before extending the agreement. The company, on the other hand, claims that it cannot carry out this program without an increase in fares.

Franchise Negotiations in Akron Likely

Negotiations will be started soon regarding a new railway franchise for the Northern Ohio Power & Light Company. The principal matter to be decided will be the rate of fare. The present rate is 7 cents, four tokens for 25 cents or seventeen tickets for $1, with free transfers. Company officials have indicated they will ask an increased fare to bring the rates in Akron to a parity with those in other cities. Whether higher fares will be asked will depend largely upon the company's ability to keep down operating costs of its combined railway and bus system, it was intimated. The question of improvements and extensions demanded by the city also will play a part in determining what the fare shall be under the proposed new agreement.

A. C. Blinn, vice-president and general manager of the company, says he anticipated no trouble in framing a new agreement satisfactory to the company and the city. Mr. Blinn said:

> The N.O.P. is three years ahead of its schedule expansion in the power and light department. We are so far ahead of the city's normal demand for electric current that we are able to meet almost any emergency here, making our service in this field practically perfect.

Rock Island Fare Increase Still Opposed

The city of Rock Island, Ill., will continue to oppose the proposed increase in fares by the Tri-City Railway on the Illinois lines, according to members of the City Council. City Attorney R. R. Reynolds, who represented the city when the Illinois Commerce Commission met July 28 at Chicago to take up the petition of the railway, gave a brief report of the hearing, which was postponed until Sept. 7. This is to permit examination of the exhibits introduced into the testimony pertinent to operation deficits of the company.

One-Man Cars an Issue in Washington

William McK. Clayton on Aug. 15 challenged the right of the Public Utilities Commission of the District of Columbia, under the law which created it, to permit the electric railways to operate one-man cars in the District without charging less fare than on cars manned by two trainmen. He appeared before the commission to make a last plea in behalf of the Federation of Citizens' Associations in opposition to the reported decision of the commission, all but promulgated, to permit the Washington Railway & Electric Company to buy 30 one-man cars to replace thirteen old ones and seventeen old two-man cars. Mr. Clayton is chairman of the public utilities committee of the federation.

Chairman John W. Childress, of the commission, said it was not admitted that one-man car service was inferior to the two-man type of conveyance. He also said that so much had been said at the semi-public hearing on Aug. 15 that he thought the commission would throw the whole question open again.

Providence Company Pleads for Abandonment of Freight Service

The United Electric Railways, Providence, R. I., has petitioned the Public Utilities Commission for authority to abandon trolley freight service. Some of the firms that would be adversely affected have retained counsel to oppose the petition. It is claimed that a decision favorable to the railway will handicap certain manufacturers.

Instruction Classes in Salt Lake City

Training classes for railway operators were held recently by the Utah Light & Traction Company, Salt Lake City, Utah, to demonstrate and instruct the trainmen on the proper operation and care of the new cars. These classes were in charge of one of the company's supervisors, who has made a study of the new equipment. The classes were shown the workings by means of large blackboard drawings and were instructed after a close study was made of the cars while in operation. A miniature car was also used for demonstration purposes, this car being a perfect model of one of the cars.

Interurban Rate Increase for Gary Railways

A 33⅓ per cent increase in rates for commutation tickets on the interurban line of the Gary Railways between Gary and Valparaiso, Ind., has been authorized by the Indiana Public Service Commission. The order specifies a new ten-ride bearer ticket at the rate of $4 and cancels the former tariff providing for the sale of 25-ride tickets for $7.50. The new rate became effective on Aug. 19.

In its petition for the higher fares, the company pointed to the heavy operating losses suffered on this line due to automobile competition. The line serves a large number of summer resorts in the vicinity of Valparaiso.

Baltimore Fare Hearing Expected Early in September

The hearing on the application made to the Maryland Public Service Commission by the United Railways & Electric Company, Baltimore, for increased emergency fare pending the hearing of the company's application for a 10-cent fare probably will open on Sept. 1. It has been announced that the commission will take up the emergency application as soon as it can clear its docket of other emergency cases. Both sides are now busily engaged in preparing the data that will be submitted to the commission.

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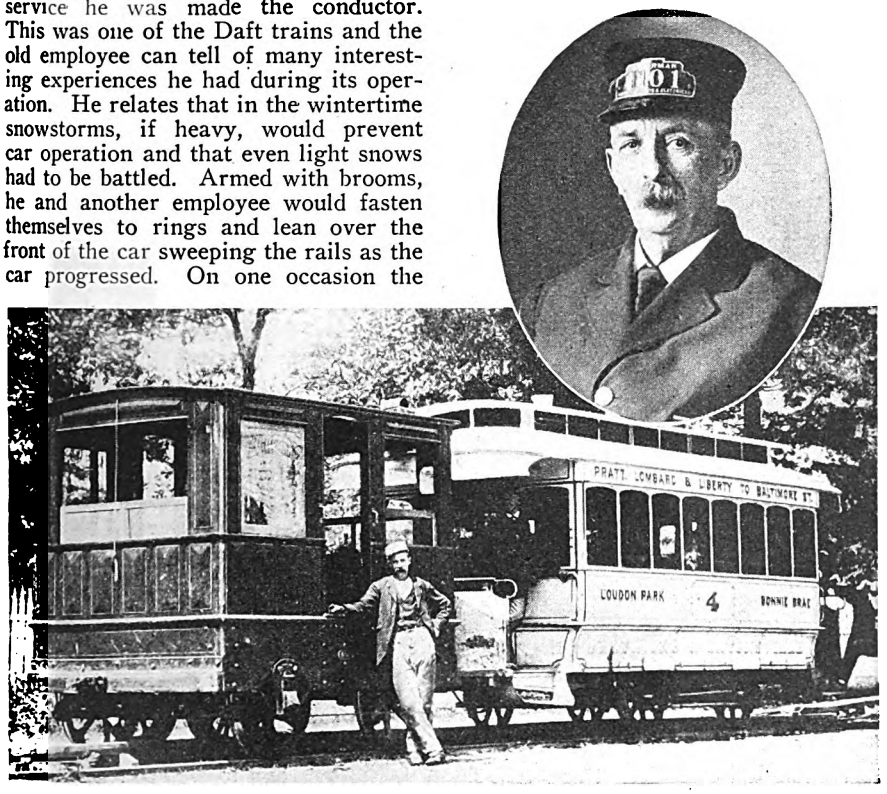
Fifty-Year Man Honored at Baltimore

Joseph Evoy, conductor of the first commercially operated electric street car in America, is still in the employ of the United Railways & Electric Company, Baltimore, Md. He was honored on July 13 by C. D. Emmons, president of the company, who paid high tribute to the old employee and presented him with a gold medal set with diamonds and inscribed "Fifty-Year Man."

Mr. Evoy was conductor on the Baltimore & Hampden line, a third-rail system that was started on Aug. 10, 1885. He went with the company, however, on July 13, 1877, as groom and caretaker of sixteen horses used to draw the street cars. He received several promotions and when the first commercially operated electric car was put into service he was made the conductor. This was one of the Daft trains and the old employee can tell of many interesting experiences he had during its operation. He relates that in the wintertime snowstorms, if heavy, would prevent car operation and that even light snows had to be battled. Armed with brooms, he and another employee would fasten themselves to rings and lean over the front of the car sweeping the rails as the car progressed. On one occasion the president of the company saw this performance and questioned the men's safety. Evoy's sweeping partner relieved the executive's mind with this reply, "How the hell can we get run over? If we fall off here the car will stop."



Operator of line started in Baltimore in 1885 honored

New Jersey Board Approves Ordinance

The Board of Public Utility Commissioners of New Jersey approved on July 14 an ordinance of the town of Phillipsburg, N. J., on application of the Phillipsburg Transit Company. The ordinance adopted by the town on May 25 grants to the transit company a franchise to operate cars upon certain streets of the town for a period of 25 years.

A section of the ordinance concerning stopping of cars upon the approach of fire engines was not approved for the regulation appeared to be against the mandate of the traffic act of New Jersey as to municipal legislation.

The section prescribing certain details of service was deemed "reasonable" and was approved since the board is vested with authority to order electric railways to provide safe, adequate and proper service.

Changes Sought in Salt Lake City to Reduce Costs

The Utah Light & Traction Company, Salt Lake City, Utah, has applied to the Public Utilities Commission of Utah for permission to substitute bus service on certain sections of its street car lines in Salt Lake City and outlying districts, the abandonment of one line and the rerouting of another line to permit partial abandonment. If permission is given to substitute buses service will be provided, according to the application, to take care of the entire requirements of the company's patrons in these localities, at the same rates as have been in effect for street car service, with no change in zone termini. Discontinuance of the company's Mill Creek bus line is also asked, because of lack of patronage. Where abandonment of certain sections of line is proposed, it is stated that this service is no longer required because of the proximity of other lines.

These changes, the management states, have been requested with the idea in mind of reducing operating costs and at the same time providing adequate service to meet the requirements.

$190,000 Improvement Budget for Wheeling Traction

The Wheeling Traction Company, Wheeling, W. Va., will spend this year approximately $190,000 in Martins Ferry and Bridgeport, Ohio, just across the river from Wheeling, where a method of co-operation has been worked out to the mutual advantage of both the city and the company. In Bridgeport, through the co-operation of the state, the county, city of Bridgeport and the company, Main Street is to be reconstructed from the Wheeling-Belmont bridge to the Brookside line. This is the National Pike.

In Martins Ferry work is already far along on the Marietta-East Liverpool Highway. This is a stretch of 11,900 ft. and if the weather permits this work will be finished this year. It is also planned to reconstruct the track on Hanover Street between Fourth and Fifth Streets, a project made possible through the co-operation of the city of Martins Ferry and the company under an arrangement by which both parties gain.

The general principle was recognized in the Martins Ferry and Bridgeport work that conditions under which railways operate with respect to their responsibilities for paving are not the same as in the past.

Southern Against Piedmont & Northern Extension

A series of objections to the application of the Piedmont & Northern Railway for permission to extend the electric railway from Spartanburg, S. C., to Gastonia, N. C., and from Charlotte to Winston-Salem, both in North Carolina, have been placed before the Interstate Commerce Commission by the Southern Railway. Approximately 128 miles of new construction is contemplated by the Piedmont & Northern. The objections of the Southern were incorporated in the brief placed before the commission to supplement the oral argument. As a primary ground of opposition to the Piedmont extension, the Southern's brief declared that the Duke Power Company, the estate of the late J. B. Duke, and a series of affiliated power and utilities corporations controlled the Piedmont system. All of these affiliated corporations co-operated to bring about an artificial control of traffic, the brief continued, by reason of their own requirements for coal and for intershipment of other commodities. The brief says:

The Piedmont & Northern as now constructed has been a predatory enterprise from the time of its construction. The proposed line would closely parallel the lines of the Southern Railway and would depend for traffic upon that which could be taken away from existing lines. The construction and operations proposed would deprive the Southern Railway of more than $10,000,000 gross revenue in the first year and larger amounts in subsequent years, and would impair the ability of the Southern Railway to serve the public.

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North Shore Line Issues Book on Service Ideals to Employees

One of the first volumes of practice for personal service to patrons ever issued by an electric railroad has been distributed recently to employees of the Chicago, North Shore & Milwaukee Railroad. This book, containing in concise form the best methods of handling customer situations, was compiled from suggestions made by employees of the Illinois road during conferences in connection with the service improvement program now being conducted. It is a new departure in the field of public service and is expected to be of invaluable assistance in promoting better relations with the public.

Indiana Interurban Under Three-Cent Mileage Rate

The basic passenger rate of the Chicago, South Bend & Northern Indiana Railway was 3 cents a mile beginning on Aug. 8, instead of 2½ cents. The new rate, authorized by the Indiana Public Service Commission, puts practically all interurban lines in Indiana under the 3-cent rate. Until a year ago the Chicago, South Bend & Northern Indiana Railway also was charging this rate, but the rate was lowered to combat bus competition. It has failed, however, to draw sufficient patronage to make the passenger department pay. The sale of books, containing $5 worth of transportation for $3.75, will be continued, and commutation books at the rate of 1⅞ cents a mile which can be used by the entire family also will be sold.

Advertising Invites Riders in Evansville

"Ride the street cars and save the difference," a slogan adopted by Frank J. Haas, vice-president and general manager of the Southern Indiana Gas & Electric Company, Evansville, Ind., has proved most effective advertising for the company. In spite of the fact that the number of automobiles in Evansville has steadily increased during the past year or two, the traffic on the city lines also has held up exceptionally well. Mr. Haas says he has observed during the past few years that among the best patrons of the street cars are people who own automobiles.

Annual "No-Accident" Get-Together in Salt Lake City

Thirty-one trainmen were guests of the management of the Utah Light & Traction Company recently at the annual "No-Accident" dinner, held at the Newhouse Hotel, Salt Lake City, Utah. The guests were all trainmen who have qualified by having no accidents during the preceding year. F. E. Hansen, head of the claims department, acting as toastmaster, impressed upon the men the necessity of carrying out the "safety first" idea to the utmost. A number of the men made short talks, relating incidents occurring in the daily routine of their duties. The keynote of the meeting was the emphasis laid on a satisfactory mental attitude on the part of the trainmen in the successful prevention of accidents.

Virginia Railway Fares to Be Cut

Extensive reductions in fares between Washington and Alexandria and Washington and Fairfax have been announced by the Mount Vernon, Alexandria & Washington Railway and the Arlington & Fairfax Railway, the two companies now operating the lines of the old Washington-Virginia Railway. The reductions also apply to intermediate stations on both lines and to the Mount Vernon, Alexandria and Washington Railway's line to Mount Vernon.

The reductions will become effective on the Mount Vernon line on Aug. 22, and on the Fairfax line the first week in September, at the expiration of the 30-day period from the date of the filing of the reductions with the Interstate Commerce Commission and the Virginia State Commerce Commission at Richmond, unless they should be protested.

The most drastic cut is in the round-trip rate between Washington and Alexandria. This has been reduced to 25 cents. The straight fare rate will be 20 cents. The rate was formerly 24 cents straight and 40 cents for the round trip. The 25-cent round-trip rate applies to all stations between Washington and Alexandria except those to which the straight fare is only 10 cents. The round-trip rate to these stations is 20 cents.

On both lines the fares have been reduced from 3 cents a mile to approximately 2½ cents a mile, except the Alexandria - Washington round - trip rate, which represents a reduction of about 40 per cent. The new rate to Mount Vernon is 45 cents straight.

The new rates on the Mount Vernon line run from the south end of the Highway Bridge and on the Fairfax line from Rosslyn, Va., over Key Bridge.

At the same time the reductions were made public the two companies announced that they had increased the wages of their conductors and motormen 2 cents an hour. These increases become effective with the new rates.

Additional cars have been put in operation between Washington and Alexandria, the cars now running every 20 minutes. The new policy of the companies as outlined by M. E. Church, president of the Fairfax line, and J. W. Rich, general manager of the Mount Vernon line, is to speed up operation and reduce fares as much as possible over the more congested parts of the lines, principally between Washington and Alexandria.

The successor companies began operation on Aug. 1. They are directed entirely by Virginia men.

Wage Scale Continued in Worcester

The Worcester Consolidated Street Railway, Worcester, Mass., has announced an agreement with the employees which continues for another year, effective Oct. 31, the existing wage scale, which has been in force since 1925. The wage scale gives two-man crews 68 cents an hour and one-man operators 76 cents an hour. Carhouse employees and other workers have a varied scale which has been in effect for the past two years.

The union has initiated a move whereby uniformed employees can go on a six-day week by sacrificing the day's pay for the seventh day. In the case of two-man crews the difference between the six-day-a-week and the seven-day-a-week schedule is $6.04. The plan is similar to that adopted by the Boston Elevated Railway.

The committee representing the employees of the Worcester Consolidated Street Railway sought to have the present wage scale renewed for two more years. Officials of the company were satisfied to have it renewed for one year.

Illinois Traction System Service Made Still More Attractive

New train schedules on the Illinois Traction System, main division, effective recently, contain a number of additions and refinements to the passenger service that appeal to the traveler in the Illinois Traction System territory.

The "Illini," a sleeping car train connecting Champaign, Decatur and St. Louis, is now operated on a nightly schedule instead of alternate nights as previously.

A new parlor-buffet car is added to the de luxe service on the main division, leaving Springfield each noon at 12:07 o'clock and arriving in St. Louis at 3:20 p.m. This car is attached to the "Tangerine Flier" and has been reconstructed and redecorated at the Decatur shops so that it harmonizes with the tangerine color treatment of these popular fast trains.

In addition to this parlor-buffet car there is, of course, the regular parlor and diner service provided by the "Capitol Limited," operated daily between Peoria and St. Louis. There is no change in the schedules of either the "Capital Limited" or The "Owl," sleeping car trains connecting St. Louis, Springfield and Peoria, except that the running time of the latter is lessened by a few minutes.

There are several slight changes in the running time of other trains that permit of improved connections by trains of the Illinois Traction with steam railways at junction points.

An intensive advertising campaign has been planned and is being carried out by the company for the popularizing of these improved passenger trains with the public.

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"For the Joy of the Working" on J. M. Symington

He could not be painted "wart and all" as there are no warts—not even the faint vestiges of the wounds he received in the World War. Instead, an arresting profile, aquiline nose, arched brow, keen eye, cigarette and chevron are the conspicuous concomitants of James M. Symington, Public Service Railway official, as he appeared to the world in the Aug. 13 issue of the *Saturday Evening Post*. Whether this subject was querulous, garrulous or just plain docile, the artist, Joseph Cummings Chase, author of "The Adventure of Being Painted," does not make plain. Speaking generally, he states that the male of the species comes to the ordeal of being painted with the frank admission that the sooner finished the better.

To the reader of the *Saturday Evening Post*, whose wandering eye must light on Mr. Symington after a tender glance at "The Kingsford Children" and a lingering look at "Mrs. Torok," it should be told that he is well known in the railway field. He entered the employ of the Public Service Railway in July, 1916, as a cadet engineer, following his graduation from Yale University. Late in November, 1925, he was appointed division manager of the Essex division and prior to that promotion he had been assistant to the general superintendent. For meritorious services during the World War he was cited, later receiving an honorable discharge.

Celebrate Rehabilitated System in Rockford

The Rockford, Beloit & Janesville Interurban Railway made an event of the first run of its new cars on the rehabilitated system and a group of Rockford, Ill., officials and newspaper men were aboard the "Winnebago" when it made the initial trip from Rockford to Janesville. Al Olson, for 26 years in service of the Janesville division, was motorman for the trip. Motion pictures were taken of the party as it left Rockford and W. H. Dougherty, Janesville attorney for the system, was host at a dinner for 31 at his cabin on the Rock River. A. P. Lewis, superintendent for the Rockford Public Service Company; C. C. Shockley, passenger and freight agent; John Lewan of the General Electric Company and W. G. Bracken, superintendent of the Roscoe Electric Company, were among the officials on the trip.

Aurora-Elgin Rate Boost Effective

Passenger commutation rates, ranging from 15 to 20 per cent higher than former fares, were put in effect on Aug. 1 by the Chicago, Aurora & Elgin Railroad.

The company was authorized several months ago by the Illinois Commerce Commission to increase commuters' rates after evidence had been presented that operating costs had climbed 110 per cent since 1914, compared with a gain in fares of only 24 per cent.

Men Who Move Cars in Pittsburgh

The Pittsburgh Railways, Pittsburgh, Pa., has a corps of men to expedite the movement of its cars. At a recent luncheon held in the Chamber of Commerce the members of this traffic department got together for the first time in the history of the company, to see what they looked like in their brand new whipcord uniforms and caps, with their black ties and shoes, and to hear short addresses made by Vice-President Thomas Fitzgerald, General Manager W. T. Rossell, Superintendent of Transportation J. M. Loftis and Commercial Manager William H. Boyce. A. J. Fink, superintendent of traffic and schedules, presided. All of the speakers sought to impress the traffic "movers" with the necessity of co-operating with the motormen and conductors to the end that the best of service might be provided for the patrons of the company. The uniform was adopted at the instance of the men themselves and patterned along lines they selected.

Buffalo Believes in Signs

The International Railway, Buffalo, N. Y., is focusing public attention on its track improvements and repaving by placing signs at all points where men are working. Such signs read: "Danger, Men Working, I.R.C. Repairing Tracks and Repaving."

SEEKS TEN-CENT RATE.—The Kansas City, Kaw Valley & Western Railroad applied recently for authority to raise the rates for city fares in Lawrence to 10 cents. The interurban company's line runs from the eastern edge of North Lawrence to the downtown district.

FREE RIDES CONTINUED.—By a vote of six to three, the City Council of Seattle, Wash., has decided to continue the policy of free rides on the cars for policemen and firemen both on and off duty. The repealing bill, drawn last year, was taken from the files by Councilman Oliver T. Erickson.

PRICE FOR POWER SET.—The Utility Commission of Kingston, Ont., and the Kingston, Portsmouth & Cataraqui Electric Railway, operating in that city, have reached an agreement as to the price to be paid for power during the life of the railway franchise. The railway had threatened to close its service if terms could not be arranged suitable to the company.

TAKES PUBLIC INTO CONFIDENCE.—So that commuters would not be discommoded by the change the Cincinnati Street Railway, Cincinnati, Ohio, resorted to a regular referendum in making a decision relative to changing the leaving time on one of its interurban runs to Milford, Ohio. The vote was limited to the one run affected, and it resulted in a decisive majority in favor of the five-minute change. The car was scheduled to leave Government Square, the center of downtown Cincinnati, at 5:10 p.m. By check, J. R. Ong, transportation engineer, found that a five-minute earlier leaving time would result in an improvement. This car, which runs express to the city limits, would be placed just ahead of a local city car and would be able to make better time.

Members of sartorially correct crew that speeds traffic in Pittsburgh

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Recent Bus Developments

Five-Cent Bus Route Over Delaware River Suspends

The Delaware River Bridge plaza-to-plaza bus service operated by the Penn-Jersey Rapid Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, will be discontinued after midnight on Aug. 21, according to an announcement by J. A. Queeney, vice-president of the subsidiary.

In a letter to Joseph K. Costello, general manager of the Delaware River Bridge, Mr. Queeney stated that the bus line between the Philadelphia and Camden plazas had been operated as an experimental venture and the increase in tolls did not warrant its continuance.

For the month of July, 1927, the gross revenue was $5,809. Bridge tolls, because of the increase effective July 1, amounted to $4,531, or 78 per cent of the entire gross revenue.

The short line began operation under the administration of former Mayor Victor King of Camden, following his threat to establish a municipal bus route between the two plazas for a 5-cent fare, unless a private transportation company made such provision.

The Philadelphia Rapid Transit Company has applied for permission to build trolley tracks on the bridge for the operation of a short line at a 5-cent fare, paying the Bridge Commission ½ cent for each passenger. The project will be delayed until January owing to the failure of the State of New Jersey to appropriate the necessary funds for that state's share of the construction costs.

Buses Between New Rochelle and Stamford

Twenty-five double-truck interurban cars operated by the New York & Stamford Railway between New Rochelle and Stamford, Conn., were replaced on Aug. 18 with 50 motor coaches. A twenty-minute headway by bus will be maintained between Atlantic Square, Stamford, and Deane Place, New Rochelle, with ten-minute service during rush hours. The fare is to be reduced; instead of eight zones each with a 7-cent fare, there will be five 10-cent zones.

For several years the New York & Stamford Railway has been in the hands of Receiver L. S. Miller, president of the New York, Westchester & Boston Railroad and of the County Transportation Company. The latter company, which operates a system of bus lines, took up the franchise of the New York & Stamford Railway when the substitution of buses for trolleys was first considered.

Since the inception of the New York & Stamford Railway this system has taken over the old Consolidated Railroad, operating between the Byram River at Port Chester, N. Y., and the Mianus River at Riverside, Conn., the Larchmont Horse Railway, operating in the village of Larchmont, and the Port Chester Street Railway, which also operated horse-drawn cars over the streets of that village.

Buses in Lake Charles

Electric cars of the Louisiana Electric Company, Inc., made their last run recently in Lake Charles, La. Buses have replaced them, serving sections which had not been touched by the railway lines. This company was formerly known as the Lake Charles Electric Company, Inc. It acquired the property of the Lake Charles Railway, Light & Water Works Company and is controlled by the Eastern Texas Electric Company of Delaware. It operated 7 miles of line.

Buffalo Interurban Bus Line Project

The Buffalo & Williamsville Railway, which operates a single-track interurban line between the Main Street city line at Buffalo and the village of Williamsville, has given a 90-day option on its property to a committee of five Williamsville and Snyder business men. If the committee carries out its present plans the line will be scrapped and a new interurban bus company will be formed to give transportation to residents of Williamsville and Snyder up to the Buffalo city line. Justice Ouchle has outlined to the town board of Amherst a comprehensive plan of bus service for rural residential communities north of the Buffalo city line. Application already has been made to the Public Service Commission for permission to establish a bus line between Williamsville and Buffalo, but no application has yet been made for the abandonment of the Buffalo & Williamsville Railway.

Application Stirs Ire of Texas Independents

Sixteen bus lines of Fort Worth and Dallas are opposing the application of the Northern Texas Traction Company, now pending before the Texas Railroad Commission, for a permit to establish and operate a bus line between these two cities, which are situated 30 miles apart. The opposing bus lines already render adequate service between the two terminals, it is asserted. The Northern Texas Traction Company operates an electric interurban railway between Fort Worth and Dallas. The competition of the bus lines has made it necessary for the company to put on its own buses as a supplementary service to the interurban line, it is explained.

More Buses in Massachusetts Suburban Service

The Springfield Street Railway, Springfield, Mass., announced that it would discontinue railway service on the Palmer-Worcester line on Aug. 14. Patrons of the line were informed that hourly bus service would go into effect on Aug. 15, connections for Worcester being made at Southbridge. Transportation of mail matter by the street railway company will be discontinued between Palmer and Brimfield when the electrics are taken off. This stretch of about 40 miles is the longest yet to be converted from trolley to bus service by the Springfield and the Worcester Consolidated, which are under one control. Schedules will be arranged in co-operation with other intercity bus lines to avoid conflict.

Injunction Against New York Awards Denied

The application for an injunction to restrain the city from carrying out the award of a bus franchise for Manhattan, Brooklyn and Queens to the Equitable Coach Company and to prevent Mayor Walker from signing the franchise voted by the Board of Estimate, brought by Stewart Browne, president of the United Real Estate Owners' Association, has been denied by Supreme Court Justice Curtis A. Peters.

Immediately after receiving word officially of Justice Peters' decision, Mayor Walker signed the franchise. The Mayor several days ago signed the contracts for the Surface Transportation Corporation, a subsidiary of the Third Avenue Railway, for the bus franchise in the Bronx and of the Tompkins Bus Corporation for the bus franchise in Richmond.

Although Mayor Walker had signed the franchise contract, Mr. Browne said that he intended to appeal from Justice Peters' decision, and had served a notice of appeal on the Corporation Counsel. He said:

> We did not receive notice of the decision until after 3:30, the time at which I am informed Mayor Walker signed the franchise. We will ask the court for a stay in the morning. I suppose the Mayor by signing the franchise contract has complicated matters. I am not enough of a lawyer to say.

Justice Peters held that Mr. Browne had failed to prove his charge that Mayor Walker had denied a public hearing on the Equitable Company's amended application for a franchise and said the preponderance of the evidence was that the Mayor had not, as alleged by Mr. Browne, called the item on the Board of Estimate calendar in "a low tone of voice." Justice Peters also ruled that Mr. Browne had failed to prove that the offer of the Equitable company was less favorable to the city than the offers of other companies, and that in any event he had not made any charge of fraud against the Mayor and other city officials, who were vested with a certain amount of discretion.

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Individual routes in the franchise granted to the Equitable company are still subject to approval by the Transit Commission in the hearing on the application which the company will have to make for certificates of convenience and necessity, and it is understood that the Brooklyn-Manhatttan Transit Corporation will oppose certain routes in Brooklyn on the ground that they would compete with existing surface lines.

Applies for Bus Permit in Millville

The Millville Traction Company has applied to the City Commission of Millville, N. J., for permission to discontinue service and to substitute buses with a similar schedule and rate of fare. The company asserts that thousands of dollars have been lost annually in maintaining railway service, and that while fares have been doubled wages and costs of upkeep have advanced also, and with one-man cars the heavy losses continued. Bus lines and private automobiles have almost depleted the ranks of trolley riders. The commission laid the application over.

Right to Substitute Bus Service Secured in Lincoln

Following a dispute with the City Council at Lincoln, Neb., which sought to compel it to contract to assist forever in the maintenance of a portion of a viaduct, the Lincoln Traction Company won out. By the payment of $3,200 to repave that portion occupied by tracks of the Lincoln, Capital Beach & Milford, which it operated, the company has secured permission to substitute a bus service. The Beach Railroad had asked the State Railway Commission to permit it to take up the tracks. It said it owed the Lincoln Traction Company several thousand dollars, had no money to pay it, no cars to run itself, and wanted to quit.

The commission called in the City Council, suggested it withdraw an ultimatum that would stop all bus service to the Beach and suburb of Lakeview, and then issued an order allowing the abandonment of the track, contingent on the payment of the $3,200 and the substitution of adequate bus service. The money was paid, the tracks will soon come up and buses will do all the work.

The company has been authorized by the State Railway Commission to abandon the use of street cars in giving service between midnight and 6 o'clock in the morning. The railway is required by the commission to substitute a bus service of similar adequacy and to extend it so as to give service hourly between the city and the Burlington roundhouse and stockyards, 3 miles west. The commission held that this arrangement might bring enough traffic for the company to break even on the entire owl service.

Bus Line to Care for Traffic

The Chattanooga Traction Company, Chattanooga, Tenn., seeks to discontinue passenger service on its Red Bank branch from the Signal Mountain lines, according to petitions filed recently with the Railroad and Public Utilities Commission. The railway company would contract with F. S. Wingate, bus line operator, to care adequately for the passenger service on his bus line. The bus lines parallel the traction line and makes it unprofitable to continue the service, the petition sets out. The freight service to the manufacturing concerns in that section will be continued, the petition declares.

Capital Traction to Operate Parlor Car Coach Line

Permission to establish a new 25-cent parlor car coach line from Cleveland Park to the downtown section was asked by the Capital Traction Company, Washington, D. C., in a recent letter to the Public Utilities Commission.

Parlor car rights with a special rate of fare were sought by this company several years ago, when it started the coach line which runs from Chevy Chase to the Capitol.

The recent application for another parlor car line is somewhat similar to the request made by the company in December, 1925, but which was refused by the former Utilities Commission. For a part of the distance the new route would cross the path of the original parlor car line and would issue free transfers to it. The new line would be operated on a twenty-minute schedule, with extra service as required.

J. H. Hanna, president, said that experience had shown that the operation of service of this character did not seriously compete with parallel street car or bus lines operated at a lower fare; that the character of the territory through which either of the proposed routes would operate was of such a nature as would prove exceedingly attractive for a high-grade parlor car bus line.

Buses May Succeed Cars on Montrose Line

Engineers of the Public Service Railway, Newark, N. J., are making a survey of the Montrose line, which operates between the Erie Railroad station in West Orange through Orange Valley to the Lackawanna Railroad station in South Orange, to determine whether the line has outlived its usefulness. No trolleys have been operated over the route since a recent storm, considerable damage having been done by washouts. If it is found that continued operation of the line is impracticable a move will be made by the Public Service to substitute buses which have been serving the territory. The Montrose line was built in 1897 by the South Orange & Maplewood Traction Company. It was taken over by the North Jersey Street Railway in 1906 and leased to the Public Service when the North Jersey lines were taken over. Before the line can be abandoned or buses substituted for the trolleys the Public Service Railway will have to obtain the consent of the stockholders of the old companies.

Chicago Surface Lines Starts Feeder Bus Service

Entering the field of motor coach operation for the first time, the Chicago Surface Lines on Aug. 11 established a new bus line on Diversey Parkway, Chicago, in co-ordination with the street car service. The new line extends from Laramie Avenue some 1½ miles east to Crawford Avenue, where connection is made with the Diversey car line terminating there. The 7-cent fare charged on the buses includes transfer privileges to street cars operating to all parts of the city.

The application of the Chicago Surface Lines for a bus certificate has been before the Illinois Commerce Commission for more than a year, but an order was issued only a short time ago. Objections to such a grant have been filed from time to time by the Chicago Motor Coach Company and the final order is now being appealed by the coach company.

Three new street car type twin coaches were purchased of the Frank R. Fageol Company by the Chicago Surface Lines and are now in operation on the new bus route. Two additional coaches of the same type are now on order and will be assigned to this service when delivered next fall. The present schedule calls for a six-minute headway.

NEW LINE PLANNED.—The Eastern Massachusetts Street Railway has been granted permission by the City Councils of Lawrence and Lowell, Mass., to operate a bus line via Shawsheen Village and Tewksbury. No opposition is expected when these towns vote on the matter.

BUSES WOULD RUN OVER ABANDONED LINE. — The United Traction Company, Albany, N. Y., has asked permission to abandon certain lines on Fifteenth Street in Troy. The Capitol District Transportation Company, its subsidiary, would serve the abandoned portions if the certificate is granted.

BUSES MUST CARRY FIRE EXTINGUISHERS.—Following the ruin of one or more buses by fire in Tennessee an order was issued recently by E. M. Gillenwaters, Commissioner of Labor and State Fire Marshal, stating that all buses operating in the State of Tennessee must be equipped with fire extinguishes "that the lives of their patrons may be safeguarded and at the same time should a fire occur, that the class of conveyance might be saved." Failure to comply with the rule will subject the violator to a fine of from $10 to $50 for each and every offense.

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Financial *and* Corporate

Brooklyn Company to Appeal Commission's Bond Order

Appeal will be taken by the New York Rapid Transit Corporation from the decision of the New York Transit Commission in barring its application for permission to issue $20,000,000 in bonds to be sold to the Brooklyn-Manhattan Transit Company for $16,000,000. The Transit Commission in denying the application of the Rapid Transit Company held that the sale of the bonds to the B.-M. T., which is the parent company, was among other things prejudicial to the interests of the city of New York because of the city's partnership with the company in the routes on which the cars are to be used.

The Rapid Transit Corporation proposed to issue the bonds in order to comply with the Transit Commission's order directing the purchase of a number of new steel cars. Compliance with this order will be held up by litigation over the bond issue.

Under the rules of the commission the company has thirty days in which to decide if it will obey an order or take the matter to court. It was said, unofficially, that the New York Rapid Transit Corporation had decided to challenge the commission's denial of the bond issue application on the grounds that the commission had not made reasonable objection.

Omaha Bonds to Be Extended

A proposal of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the extension of its 5 per cent bonds, due Jan. 1, 1928, for three years, the bonds to bear interest at 6 per cent for the period of extension, has been approved by the bondholders' protective committee. In a formal announcement the committee sets forth that "under present conditions and pending the obtaining of a new franchise upon satisfactory terms from the city of Omaha, the company is unable to pay or refinance its bonds at maturity, Jan. 1, 1928." Recommendation is made by the committee that bondholders deposit their bonds with the New York Trust Company, New York, or with the Omaha National Bank, Omaha, depositories.

Railway Traffic on Increase in Richmond

While the number of bus riders of the Virginia Electric & Power Company, Richmond, Va., decreased nearly 40,000 from June to July, the number of railway passengers showed a gain, and the total number of riders for the month of July was 2,581,830, compared with 2,544,000 in June, according to a statement issued by Thomas P. Walker, vice-president, at Norfolk. In July there were 1,945,147 street car riders, compared with 1,870,000 in June, and 636,000 bus riders, compared with 673,000 in June. Of the July riders, 15 per cent of the total paid the cash fare of 10 cents, 58 per cent bought tokens at the rate of 8⅓ cents, 25 per cent bought weekly commutation passes, riding for an average of 4½ cents, and 2 per cent used school and excursion tickets. An average of approximately 3,900 passes are sold weekly, and a check by the company shows that each pass is used on an average of a little better than five times a day, or 26 rides a week. In July 394,000 street car transfers and 104,986 bus transfers were given free.

Another Move in Akron Tax Suit

Temporary restraining orders from the U. S. District Court have been served on county treasurers of Summit, Portage, Medina, Stark and Tuscarawas Counties preventing the collection of 1926 tax claims against the Northern Ohio Power & Light Company, Akron, Ohio. The court's order will remain in effect until a final hearing is held. Approximately $500,000 is involved. Company officials state they will fight the 1926 tax valuation in nearly every county of Ohio in which the company operates. Assessments are on the average 35 per cent too high, they say.

The significant points at issue were discussed in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 9, 1926, page 88. At that time discrimination was charged by the company and uniformity sought in the method of assessment.

St. Louis Sale Confirmed

Court sanctions disposal of United Railways' property to the reorganization committee—Objections by city rejected

FEDERAL JUDGE FARIS on Aug. 17 approved the sale of the United Railways, St. Louis, Mo., to the reorganization committee, rejecting the city's objections, and gave the municipality four months to elect whether it will settle the mill tax judgment of $2,396,321 on the basis of one-third cash or the alternative offer of two-thirds preferred stock of the company. The court allowed the city interest only to the date of the receivership in 1919, or $35,545, making the total claim $2,431,867. The city may be limited to the cash offer, as legally under its charter it cannot hold stock in private corporations.

Judge Faris held the offer to the city was fair when compared with the settlement made with stockholders of the old company. He figures preferred stockholders get $21.75 on each $100 of their claim and common stockholders only 75 cents compared to the offer of $33.33 cash or twice that in stock offered the city. As a member of the Missouri Supreme Court Judge Faris once gave a minority opinion ruling against the validity of the mill tax. This was later sustained by the United States Supreme Court. Shortly thereafter the company went into the hands of receivers.

In discussing the financial difficulties of the company Judge Faris said that its troubles were due largely to overtaxation, citing that no other corporation or individual in Missouri has such a tax burden. He stated any suggestion of a return to the 5-cent fare is not even respectable nonsense, pointing out that while fares have advanced from 5 to 7½ and 8 cents the expenditures for wages, equipment and materials by the company in the same period advanced 81 per cent. The city probably will appeal to the United States Circuit Court of Appeals.

The agreement for the settlement of unsecured claims against the United Railways, St. Louis, Mo., was attacked in a brief filed with United States District Judge Faris on Aug. 15 by Associate City Counselor Dolan on behalf of the city of St. Louis. The city objected to the sale unless it is paid in full a claim of approximately $3,500,000 in delinquent mill tax with interest to date. The brief held that from every point of view the offer of the reorganization committee for the railway properties failed to measure up to the standard demanded by the United States Supreme Court because it did not give precedence to full claims of the creditor over every interest of the stockholder. It drew a comparison between the offer made by the reorganization committee to holders of preferred stock in the United Railways and to the holders of unsecured claims. The city was placed in the latter class.

Steam Roads to Acquire Central California Traction

The Interstate Commerce Commission on Aug. 16 authorized the Southern Pacific Company to acquire by capital stock purchase the control of the Central California Traction Company, a 55-mile electric road through the fruit growing region, extending from Sacramento to Stockton, Cal. The permission was conditioned upon the Southern Pacific's admitting either the Western Pacific or the Santa Fe, or both, to participation equally in joint control of the acquired carrier. The commission denied the application of the Western Pacific to build a branch line from Villinger to Lodi, 11 miles, in San Joaquin County, to furnish transportation in the same manner.

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The Southern Pacific and the Santa Fe each asked the commission for authority to acquire exclusive control of the electric railway, which is owned by Herbert Fleishhacker, San Francisco. The price of the line was understood to be $3,000,000. In its decision the commission said that the railroads in seeking exclusive control had not in mind the financial building up of the short line itself, but that the joint control provision would fulfill this purpose. Because of the arrangement on the Central California Traction System the necessity of the Western Pacific to build was eliminated.

Sale of Washington-Virginia Road Confirmed

Justice Jennings Bailey in Equity Court has signed a decree confirming the sale of the District of Columbia assets of the Washington-Virginia Railway and the subsidiaries of this line. This decree conforms with a similar document which has been confirmed by Judge Brent at Fairfax, Va., which affects the Virginia holdings of the company.

The assets of the Mount Vernon line, which runs through Alexandria, were sold to a committee of bondholders for $300,000 and the assets of the Falls Church line were sold to a committee of bondholders for $150,000. The rolling stock of these lines brought $125,000—making a total of $575,000.

The new Mount Vernon, Alexandria & Washington Railway will operate the Mount Vernon line and the new Arlington & Fairfax Railway will operate the Falls Church line. Both are expected to use the Washington terminal at Twelfth Street and Pennsylvania Avenue northwest.

Miss Bessie W. Allender, a bondholder, objected to the confirmation of the sale, but Judge Bailey ruled that if the commission made any errors in lining up the assets of either subsidiary line for sale, the matter should be taken up with the State or the federal courts in Virginia, as the local courts have no jurisdiction over any Virginia trackage, even though some of it runs through a federal reservation at Arlington.

On July 26 the State Corporation Commission granted a charter to the Mount Vernon, Alexandria & Washington Railway. The company, which is a reorganization of the Mount Vernon division of the former Washington & Virginia Railway, has a capital of 5,000 shares of no par stock. The officers of the new company are: Gardner L. Boothe, Alexandria, president; Lewis H. Parson, Philadelphia, vice-president; Harrison Emhardt, Alexandria, secretary; George E. Warfield, Alexandria, treasurer. The board of directors is composed of these officers and the following: William G. Baker, Baltimore; J. W. Rich, Washington; Samuel F. Steele, Philadelphia.

The Arlington & Fairfax Railway, which was recently formed by the citizens of Arlington and Fairfax Counties to purchase the Falls Church division of the Washington-Virginia Railway, will take over the railroad at once. According to President M. E. Church, the board of directors of the new company has filed with the Interstate Commerce Commission a schedule of fares showing a material decrease in the present fare. Commutation patrons of the road still will benefit by the Highway Bridge ½-cent refund, but the trouble occasioned by the refund will be eliminated. This will be calculated in the new rates, which become effective 30 days after filing. Temporarily there will be no change in the operation of the road.

News from Maine

THE Biddeford & Saco Railroad, Biddeford, Me., paid its regular semi-annual dividend of $1.50 a share on its common stock on Aug. 1. This marks the twentieth year in which this road, operating on a 5-cent fare system, has forwarded dividends to its shareholders. Operating 8.5 miles of line, the railway connects Biddeford, Saco and Old Orchard.

Key System-Southern Pacific Compact Unlikely

Although the Railroad Commission of California, in a recent report indicated the economies that might be expected from a pooling of the interests of the Key System Transit Company and the Southern Pacific Company at Oakland, Cal., it is understood that the arrangement has been discounted by officials as an early eventuality, and the Key System, under its new management, which represents security holders direct, proposes to proceed on its own initiative and without regard to the Southern Pacific Company.

Maine Lines to Cease Operation

The York Utilities Company at midnight Sept. 6 will cease operation of its Sanford-Biddeford railway line, Town House-Kennebunkport line and Town House - Kennebunkport - Cape Porpoise bus line. These lines have been discontinued because of lack of patronage. Application has been made for a permit to run a bus line between Kennebunkport and Biddeford via Kennebunk.

The York Utilities Company, successor of the Atlantic Shore Railway, formerly operated a large system in York County, Me., running over the border into Portsmouth and Dover, N. H. These lines have been discontinued little by little until now there remains fewer than 5 miles of line in Sanford where there is a very good passenger business and also a large amount of interchange freight.

The management plans to replace all of the old cars with Birney cars and is now moving the shops from Town House, where they have been located since 1907, to Sanford. Extensive changes are being made in the carhouse at Sanford, including much concrete work and the installation of a modern heating system. The company has moved its general offices from Town House, Kennebunk, to Sanford, Me.

Would Free Manchester and Derry Property from Tax

The New Hampshire Public Service Commission has recommended in a certification to the State Tax Commission that the Manchester & Nashua Street Railway, Manchester, N. H., and the Chester & Derry Railroad, Derry, be exempt from taxation for the year 1927. The company, it is said, failed to pay operating expenses for the year 1926, and no better results are thus far anticipated for 1927. Action was taken as allowed by the state laws.

Receiver Sought for Pennsylvania Line

The Pennsylvania & Maryland Street Railway, Elk Lick, Pa., more recently known as the Meyersdale Electric Light, Heat & Power Company, which has been carrying passengers, mail and freight for a quarter century between Meyersdale and Salisbury, has discontinued service. Bondholders of the corporation have asked Judge John A. Berkey of the Somerset County Court for the appointment of a receiver. The line extended a distance of 12.5 miles.

Earnings Increase in Evansville

Transportation earnings of the Southern Indiana Gas & Electric Company, Evansville, Ind., for the year ended Dec. 31, 1926, were $811,317, against $779,718 for the year previous. In the annual report to the stockholders B. C. Cobb, president, states that the gross revenue of the company did not decrease because of slight increases in rates of fare charged from time to time. The number of revenue passengers decreased 462,426 over the previous year. This falling off in the past five years was due to increased use of private automobiles. Comparative figures showing revenue passengers carried since 1923 follows:

1922	13,318,196
1923	13,935,605
1924	12,931,255
1925	12,030,431
1926	11,568,005

To improve further the transportation service in the city of Evansville the company placed in operation thirteen modern light-weight, noiseless cars with features of the newest type. Ten buses of modern type to supplement the city railway service were also placed in

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operation. Of the $754,379 expended during the year for additions and improvements 50 per cent was used in the transportation department.

During the year the company's funded indebtedness was reduced by the redemption at 104 per cent on Oct. 1 of first lien and refunding mortgage gold bonds, series A, 7½ per cent, of which there were $853,300 outstanding. These bonds were due on April 1, 1941, but on account of their high interest rate it was deemed advisable to retire them and in due course to issue bonds bearing a lower interest rate. A total of $578,400 of preferred stock was sold on the customer-ownership plan by employees to 667 individuals in 1926.

Orders Line Between Bradford and Salamanca Scrapped

Supreme Court Justice Thomas H. Noonan has issued an order authorizing Frederick W. Kruse, Olean, former judge of the appellate division and receiver for the Olean, Bradford & Salamanca Railway, Olean, to discontinue operations of the interurban line between Bradford, Pa., and Salamanca, N. Y., and scrap the properties. There was practically no opposition to the application which was made some time ago by the receiver. Justice Noonan, the receiver, and representatives of various interests affected by the order will hold a series of conferences to discuss methods of carrying out the order authorizing the scrapping of the road which extends a distance of 85 miles.

RENTAL DIVIDEND DECLARED. — Directors of the Interborough Rapid Transit Company, New York, N. Y., declared on Aug. 3 a rental dividend of $1.25 on the Manhattan Railway's 5 per cent modified guaranteed stock on account of accumulations in the year ended June 30. This clears up all accumulations on the stock. The full 5 per cent has been paid for the last two years.

BOND SALE TO MEET CAPITAL EXPENDITURES.—The Key System Transit Company, Oakland, Cal., has been authorized by the Railroad Commission in a supplemental order to use the proceeds from the sale of $228,935 of bonds to reimburse its treasury for capital expenditures.

EQUIPMENT ISSUE APPROVED. — The Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has been authorized by the Public Service Commission of Indiana to issue $710,000, par value, of equipment trust certificates for the purchase of new cars and equipment. The original plan was to have the certificates mature over a period of ten years, with interest varying from 4½ to 5½ per cent.

SUSPENSION AUTHORIZED. — Discontinuance of local electric railway service in Watertown, Wis., by the Milwaukee Electric Railway & Light Company has been approved by an order of the Wisconsin Railroad Commission.

Personal Items

Changes in North Shore Accounting Department

Reorganization of the accounting department of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has been effected in an order issued by C. R. Mahan, comptroller, and approved by Charles E. Thompson, vice-president. The changes are as follows:

William W. O'Toole, formerly auditor, has been appointed general auditor, with jurisdiction over the disbursement accounts, freight accounts, passenger accounts, capital expenditures, general bookkeeping and joint facility accounts divisions.

Robert E. Keefe is appointed auditor of disbursement accounts, with jurisdiction over all receipts and disbursements.

The title of William J. McNanly, Jr., is changed from auditor of merchandise despatch accounts to auditor of freight accounts.

Lambert J. Wertzler, formerly assistant auditor of passenger accounts, has been appointed auditor of passenger accounts for both railroad and motor coach lines.

The title of Philip M. Cornes is changed from valuation engineer to auditor of capital expenditures.

The title of Mitchell M. Boyer, engineer auditor, is changed to joint facility accountant.

Lee Abegg is appointed chief clerk, auditor of disbursement accounts division, succeeding Mr. Keefe.

New Hampshire Elections Announced

At the recent annual meeting of the Chester & Derry Railway Association, Derry, N. H., H. L. Grinnell was elected vice-president and A. H. Wikaub secretary.

Henry R. Hayes Slated for Head of Investment Bankers' Body

Henry R. Hayes of Stone & Webster and Blodgett, Inc., is slated to succeed Pliny Jewell of Coffin & Burr, Inc., Boston, as president of the Investment Bankers Association of America. Mr. Hayes, who has been active in the association for several years, is now a vice-president and a member of the business conduct committee. The association will meet on Sept. 24 in Seattle and will adopt a new constitution and by-laws. Mr. Hayes was for several years chairman of the committee on finance of the American Electric Railway Association.

W. B. RENSHAW, assistant district engineer of the Westinghouse Air Brake Company at Wilmerding, has been advanced to the position of representative for the Westinghouse Traction Brake Company, maintaining his headquarters at Wilmerding. Mr. Renshaw entered the employ of the Air Brake Company in 1913. After filling various positions in the shop and experimental department, he was transferred to the commercial engineering department in 1922. He was appointed assistant district engineer in 1925.

N. M. FORSYTHE has been appointed representative of the automotive division of the Westinghouse Air Brake Company, with headquarters at Pittsburgh. After he was graduated from the University of Michigan Mr. Forsythe entered the service of the company as inspector in the automotive division at St. Louis, which position he held until his new appointment.

HOWARD ELLIOTT, chairman of the Northern Pacific Railway and at one time operating head of the New York, New Haven & Hartford Railroad, owning the Connecticut Company, received the honorary degree of Doctor of Laws at Carleton College, Northfield, Minn., on June 13. He was graduated from Harvard in 1881 and is now president of the board of overseers of Harvard. Mr. Elliott received honorary degrees from Middlebury College in Vermont in 1916 and Trinity College at Hartford in 1924.

H. B. GARDNER has been appointed assistant to the resident vice-president of the Westinghouse Air Brake Company at New York. Mr. Gardner was graduated from Union College, Schenectady, N. Y., as a mechanical engineer in 1916. He served several years with the Locomotive Stoker Company in mechanical and commercial activities and entered the employ of the Westinghouse Air Brake Company in 1923 as representative. In 1926 Mr. Gardner was made vice-president of the Westinghouse Friction Draft Gear Company with headquarters at Chicago. He leaves this position to accept the new appointment in the parent organization.

J. F. CRAIG, for four years representative of the Westinghouse Air Brake Company at New York, has been promoted to the position of assistant Eastern manager. Mr. Craig was graduated from Cornell University with the mechanical engineering class of 1912. He entered the experimental department of the Westinghouse Air Brake Company in 1913, but left the employ of the company in 1916 for a time, engaging in engineering work and serving in the army during the World War. He re-entered the service of the Air Brake Company in 1920 as special engineer, with headquarters at Pittsburgh, and was transferred to the New York office as representative in 1923, which position he held until the time of his recent promotion.

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OBITUARY

Judge E. H. Gary

Chairman of United States Steel Corporation served as executive 25 years—Built up huge industry

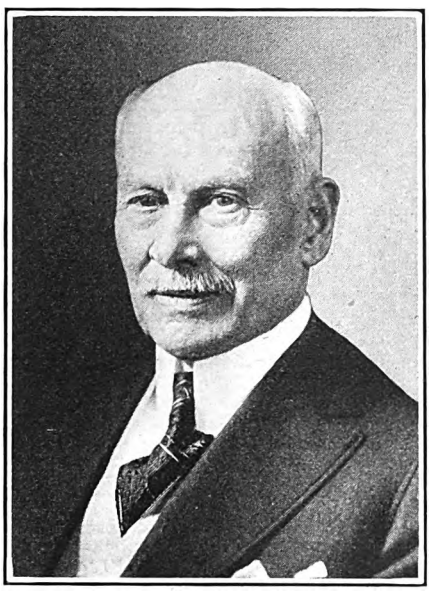
JUDGE ELBERT H. GARY, chairman of the board of directors of the United States Steel Corporation and one of the outstanding leaders of American industry for many years, died early on Aug. 15 at his home in New York. He was in his 81st year.

The history of a man like Judge Gary is more than a record of dates and places, arranged chronologically. Naturally the press is filled with encomiums well deserved. It is always so in the case of a national figure. It does seem, however, that the accomplishments of the man were best characterized by President Coolidge when he said that Judge Gary stood "foremost among those who find the great private enterprises of our country an opportunity for public service as well as a medium for financial profit." As the president indicated, Judge Gary upheld the best ideals of commerce and industry and proved that success is attained in largest measure through adherence to the highest standards of American business.

One thing more than any other about the man stood out in bold relief. That was his optimism. Critics of Judge Gary were wont to chide him for this, not realizing that it was one of the man's greatest assets. No man is without limitations and free from idiosyncrasies, but in the case of Judge Gary they were so insignificant as to be quite negligible. Of course, the man was in the limelight. It could not be otherwise. He was not impervious to public opinion, but he did have fixed policies and he adhered to them. Neither the bellowing of the economic firebrand nor the bulldozing of the financial fanatic could move him. He had a very pronounced code of business ethics, succinctly stated as a matter of public record, and when the clamor grew strong for greater participation on the part of the stockholders in the prosperity of his company, he stood out against that clamor until he was convinced that the course of action upon which he entered was fully justified. He was concerned for his stockholders, not the speculators, and the employees were numbered by the thousands among the stockholders.

It would be easy to go on piling incident upon incident. It certainly was no small accomplishment that where others proved vulnerable to attack, the chairman of the United States Steel Corporation could show that instead of injuring his competitors, he had stabilized the steel market. In so doing he made others sharers, sometimes in spite of themselves, in a position of security such as organized Germany did not attain and the adventurous steel manufacturers of Britain never even approached. One of the last things that Judge Gary did was to prepare for *Coal Age*, a McGraw-Hill publication, an article in which he recounted the progress of his company since 1906 in safeguarding its employees from accidental death. The critics to the contrary, his concern was ever for the rank and file, but there was nothing maudlin about that concern.

The Bacons and others may have achieved fame by working sedulously in seclusion, but it is not possible for the master of modern business quite to do that. And are the achievements of the industrialist or the financier any less far reaching than those of the savant when it is considered that in the hands of men such as Judge Gary the economic destiny of thousands rests at the moment and for the future? The work of the engineer and the industrialist is our heritage no less than is the heritage handed down by the savant. A money motive does not necessarily mean the thing is mercenary. Often the reward is second to the joy of accomplishment. It is incompatible to accord the cross of merit to the creative artist and to deny it to the industrialist of the type of Judge Gary. Each may work sincerely in his own field. Let us not measure one man in terms of another.



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Elbert H. Gary

Judge Gary rose to be head of the United States Steel Corporation by reason of his legal as well as his business ability. As general counsel for and director of the Illinois Steel Company in 1899 he was in charge of the organization of the Federal Steel Company, formed by an amalgamation of the Illinois and other steel companies. In these negotiations he had his first contact with the elder J. P. Morgan, whose financial support was being sought in the merger. Judge Gary was picked by Mr. Morgan and his associates to head the merger after he had shown his ability as an organizer and an executive.

Judge Gary has always been credited with having first visualized the larger possibilities of the steel industry, and with having outlined these possibilities to Mr. Morgan. Then when it became known that Andrew Carnegie wished to withdraw from the steel industry and devote his vast fortune and the rest of his life to philanthropies and world peace, Judge Gary found more ready support for his plans. He hoped to organize a corporation that would be able to compete with the steel industries of Germany and Great Britain, then dominating the international market. He won Mr. Morgan's support for the proposed steel merger.

Elbert Henry Gary was born on Oct. 8, 1846, on the farm of his father, near Wheaton, Ill. He was educated in the public schools of Wheaton, at Wheaton College and at the University of Chicago, where he received a degree of LL. B. in 1867. He was admitted to the Illinois bar in 1867 and in 1882 he was admitted to the bar of the United States Supreme Court. He entered politics as a young man and his fellow-townsmen conceded that he was a young man of promise when they elected him for three terms as president of the town of Wheaton. When the town became an incorporated city he was elected its first Mayor. Afterward he served two terms as County Judge of Dupage County, Ill., and acquired the title of Judge. Judge Gary went to Chicago, where he practiced law for twenty-five years. He was president of the Chicago Bar Association from 1893 to 1894.

Willard F. Graves

Willard F. Graves, chief engineer of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., and third vice-president of the American Electric Railway Engineering Association, died suddenly in that city on Aug. 16.

Mr. Graves's railway interests were diffused throughout the United States and Canada. Before his affiliation with the Indiana property late in 1923 he was for nine years chief engineer of the Montreal Tramways. His career began as assistant engineer of construction on the South Side Elevated Railway in Chicago, now a part of the Chicago Elevated Railways system. During that period he had charge of the reconstruction work and at the expiration of that assignment he was engaged as superintendent of track in the reconstruction and maintenance of the tracks of the Chicago City Railway.

Among his many accomplishments is the part he played in the track valuation work of the Detroit United Railway and subsequently of the Halifax Tramways & Power Company and the Quebec Railway, Light, Heat & Power Company. This valuation work was undertaken while Mr. Graves was chief engineer of the Montreal Tramways.

His association activities were referred to in detail in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 1, 1923.

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Manufactures *and the* Markets

Big Bus Tool and Parts Display Scheduled for Cleveland

Plans have been perfected by the A.E.R.A. exhibit committee looking to a large exhibit at Cleveland by the manufacturers of automotive tools and parts in the section devoted to buses and trucks. The assignment of 15,606 square feet of floor space has already been made for this type of display and according to Fred Dell, director of exhibits, there are only three spaces unsold in the section.

Preliminary announcements of the manufacturers as to the nature of their exhibits include grinding machines, power driven machine tools and reamers, hydraulic jacks, all styles of brakes for buses and trucks, crank case oil reclaiming outfits, spray paint equipment, high pressure guns, socket wrenches, magnetos, spark plugs, abrasives, engine bearing brake linings, service jacks, transmission clutches and controls, and malleable iron fittings for use in bus and truck construction.

15,606 Sq.Ft. of Space

Will be occupied at the Cleveland Exhibit by

Automotive Tool and Parts Manufacturers

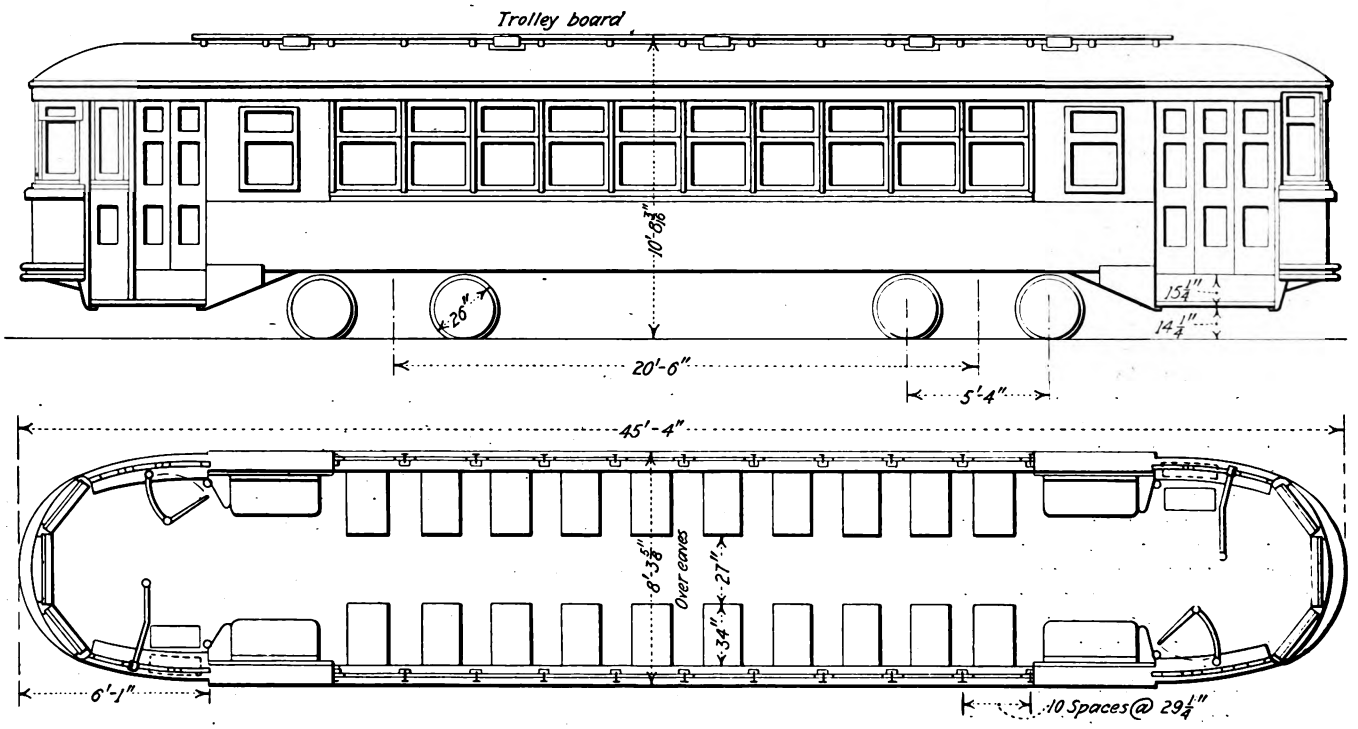
Everything from a nut to a crankcase and oil reclaiming outfit will be shown. There will be hundreds of kinks to remove kinks.

This Is a Formal Invitation to Your Bus Maintenance Man

Work on New Orleans Cars Progresses

Twenty new cars ordered last year are expected to be delivered to the New Orleans Public Service, Inc., New Orleans, La., within the next 90 days. The cars will be shipped by the St. Louis Car Company and the Perley A. Thomas Car Company. They are all

Forty All-Steel Cars Ordered by Georgia Power Company



F. L. Butler, vice-president Georgia Power Company, Atlanta, Ga., reports the placing of a car order for 40 one-man, passenger, city type, double-end units, each with a seating capacity of 48 passengers. The contract, awarded in April to the Cincinnati Car Company, Cincinnati, Ohio, calls for delivery in August and September. All-steel construction has been specified and the cars will have an over-all length of 46 ft. 4 in. Ten of the units are to be equipped with Timken roller bearings. A natural cherry interior trim and a painting scheme of green and cream colors have been chosen. Preliminary specifications follow:

Number of units	40
Type of unit	One-man, motor, passenger, city, double end, double truck
Number of seats	48
Builder of car body	Cincinnati Car Company
Date of order	April, 1927
Date of delivery	August-September, 1927
Weights: Car body	16,660 lb.
Trucks	10,700 lb.
Equipment	9,640 lb.
Total	37,000 lb.
Bolster centers	20 ft. 6 in.
Length over all	46 ft. 4 in.
Length over body posts	33 ft. 2 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3½ in.
Height, rail to trolley base	11 ft. 8 in.
Window post spacing	29¼ in.
Body	All steel
Roof	Arch
Air brakes	Westinghouse safety devices
Armature bearings	Plain
Axles	A. E. R. A. specifications E-5-24
Car signal system	Electric Service Supply
Compressors	Westinghouse DH-16
Conduit	Flexible
Control	K-75 and No. 98 cut-out switch
Curtain fixtures	Curtain Supplies Company
Curtain material	Pantasote
Destination signs	Keystone
Door mechanism	National Pneumatic
Doors	Sliding
Energy-saving device	Economy meters
Floor covering	Rubber tiling
Gears and pinions	Tool Steel, long and short addendum
Glass	Plate in vestibule, D. S. A. in car
Hand brakes	Peacock staffless
Hand straps	Rico retrieving type
Heat-insulating material	1-in. cork insulation
Heaters	Consolidated No. 321 Thermostat control
Headlights	20 cars Crouse-Hinds, 20 cars Golden Glow
Headlining	3-16-in. Haskelite three-ply veneer
Interior trim	Cherry
Journal bearings	Ten cars Timken roller bearings, 30 cars plain
Journal boxes	Brill and Timken
Lamp fixtures	Electric Service Supply Company
Motors	Four G.E. 265-A, inside hung
Painting scheme	Green and cream
Registers	Ohmer
Roof material	Poplar
Safety car devices	Westinghouse and National Pneumatic door interlock
Sash fixtures	Curtain Supplies Company
Seats	Hale & Kilburn
Seat spacing	29½ in.
Seating material	Canvas lined, cane panels
Slack adjusters	American, Form E
Steps	Stationary
Step treads	Kass
Trolley catchers	O.B. No. 13,141
Trolley base	O.B., Form 4, Timken bearing
Trolley wheels	Moccasin 6-in., 1¼-in. axle
Trucks	Brill 177 E-1
Ventilators	Nichols-Lintern Type C
Wheels, type	Cast chilled, diameter 26-in.
Wheelguards	H-B

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modern steel cars with a seating capacity of 52 passengers and are equipped with four motors. They are also fitted with the latest safety devices and treadle-operated doors designed for one-man or two-man operation.

Johnson Fare Boxes for Albany

Bertrand T. Fay, assistant to the vice-president of the United Traction Company and the Capitol District Transportation Company, recently announced that 247 Johnson automatic fare boxes had been ordered for the United Traction Company and 80 for the Capitol District Transportation Company.

Consider the Purchasing Agent

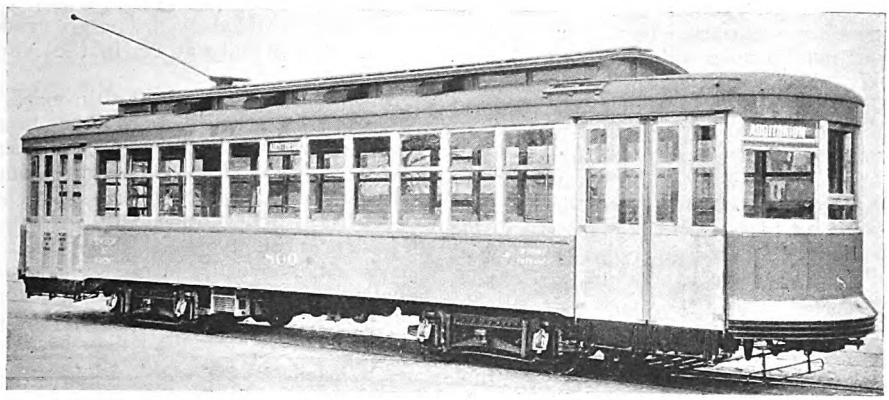
"The Functions of the Purchasing Agent" is the title of the seventh Business Organization Series issued by the Policyholders Service Bureau of the Metropolitan Life Insurance Company, New York, N. Y. The material for the booklet, which is illustrated with purchasing organization charts of various companies, was gathered from the experiences of 30 organizations throughout the country. In the foreword W. L. Chandler, secretary of the National Association of Purchasing Agents, Inc., said that more and more it was being realized the profits of the next few years would to a considerable extent be in proportion to the intelligence which was displayed in purchasing, a matter that included consideration of the rate of turnover of materials and finished products.

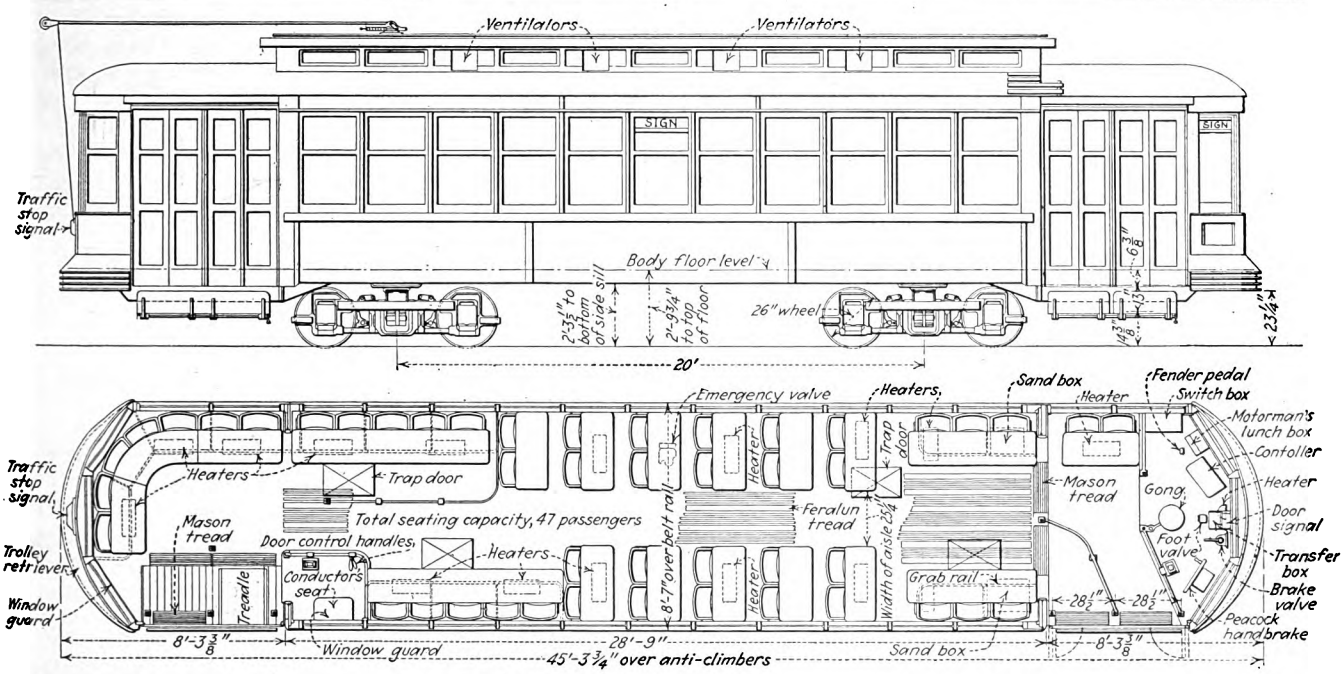
Indiana Coal Strike May End

It is rumored that most of the large union coal mines in southern Indiana will resume operations before the first of September. The strike, which started on the first of April, has caused a large decrease in freight business for the traction companies of the district.

Coal haulage is a big item in the course of a year and traction companies will welcome the reopening of the mines.

Twenty One-Man, Two-Man Cars Ordered by Ottawa Company





Twenty one-man, two-man city type units will shortly be added to the rolling stock of the Ottawa Electric Railway, Ottawa, Ont. Major F. D. Burpee, vice-president and manager of the Canadian Utility, has just announced specifications for the order, which was placed with the Ottawa Car Manufacturing Company, of the railway company's home city. The cars, with a seating capacity of 47 passengers, will be all steel, and 45 ft. 3¾ in. long. Delivery is expected within two months.

Official specifications are as follows:

Number of units	20
Type of unit	One-man, two-man, motor, passenger, city, single-end, double-truck
Builder of car body	Ottawa Car Manufacturing Company
Date of order	Feb. 1, 1927
Date of delivery	August and September
Weights:	
Car body	19,000 lb.
Trucks	11,400 lb.
Equipment	7,700 lb.
Total	38,100 lb.
Bolster centers	20 ft. 0 in.
Length over all	45 ft. 3¾ in.
Length over body posts	28 ft. 9 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	11 ft. 6½ in.
Window post spacing	2 ft. 6 in.
Body	All steel
Roof	Monitor
Air brakes	Westinghouse, safety car type
Armature bearings	Plain
Car signal system	Consolidated
Compressors	Westinghouse
Conduit	Metal
Control	K
Couplers	Hovey
Destination signs	Keystone
Door mechanism	National Pneumatic
Doors	End, folding
Fare boxes	Cleveland No. 5
Finish	Lacquer
Gears and pinions	Nuttall
Glass	Non-shatterable in door; sash, 21 oz.
Hand brakes	National
Heat-insulating material	Cork
Heaters	Consolidated
Headlights	Special
Headlining	Agasote
Interior trim	Birch, stained
Journal bearings	Plain
Journal boxes	Canadian Car & Foundry, 3¾ in. x 7
Lamp fixtures	Benjamin
Motors	Westinghouse No. 510-A2, inside hung
Painting scheme	Red and cream
Roof material	8-oz. duck
Safety car devices	Westinghouse
Sash fixtures	Metal
Seats	Cross
Seat spacing	30 in.
Seating material	Leather
Slack adjusters	Westinghouse
Steps	Folding
Step treads	Mason
Trolley catchers	Earl
Trolley base	Nuttall
Trucks	Canadian Car & Foundry
Ventilators	Nichols-Lintern
Wheels, type	A.E.R.E.A., 26 in.
Special devices	Treadle, National Pneumatic equipment

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Metal Prices Weaken Both Here and Abroad

Prices for all of the major non-ferrous metals were lower on Aug. 17 than they were on Aug. 10. The change is not great either in lead or zinc; and although copper is quotationally off 17.5 points in the domestic market, it is significant that the sales were exceptionally small and the principal producers are uniformly out of the market. Prices in London are generally down.

Second-hands and custom smelters for the most part have done what little business was transacted in a very dull copper market during the week ended Aug. 17. The larger selling agencies realized 13⅜c. in Connecticut on Aug. 11 and 13.50c. at high freight-rate points as late as Aug. 13. Occasional sales have been made at 13.30 and 13.25c. Valley, since then. Prices on Aug. 17 were as high as 13.125c., Valley, and as low as 13.125c. in the so-called Middle West. The export price continues at 13.65c. c.i.f.

Though no change has been made in the American Smelting & Refining Co.'s contract price for New York lead, which remains at 6.75c., the market is distinctly weaker. This tendency has manifested itself particularly in the West, where dealers and small producers have cut the prices asked by the leading interests. Over Aug. 16 and 17, one of the principal producers was firm at 6.40c., St. Louis, though other sellers were willing to accept orders at 6.35c., and in one direction, 6.30c. might have been done. In the East, though, the usual contract lead went out at the Smelting company's price. September and October metal was available at from 5 to 10 points concession, though the actual business done was not large.

Zinc has been quiet during the week, with only a slight easing in the price from 6.375 to 6.35c. Despite the fact that producers of concentrates in the Joplin district maintain that $44 per ton is the minimum price at which they can realize any profit, and the further fact that the price is still under that figure, output has been creeping up and is now around 14,000 tons per week. This is not calculated to help the market for slab zinc; but aside from this the situation seems balanced. High grade is quoted nominally at 8c. in the New York district.

Most of the activity in the tin market during the week ended Aug. 17 has been between dealers, but there have been only one or two days when the total tonnage reached good proportions. The price has reacted somewhat, reaching 63¾c. for prompt Straits on Aug. 17, but is still above the level reached last month. There is but little premium on prompt delivery over September. October is about ¼c. less than near-by, and November about ½c. less.

ROLLING STOCK

ARKANSAS POWER & LIGHT COMPANY, Little Rock, Ark., is in the market for two flat cars.

BOSTON ELEVATED RAILWAY, Boston, Mass., has placed an order with the Laconia Car Company, which was the lowest of half a dozen bidders, for ten No. 5 cars of the one-man, two-man type for use in South Boston, where they will replace the old box cars. The price to be paid is about $12,000 each. This order was forecast in the JOURNAL for Aug. 6.

ILLINOIS TRACTION SYSTEM, Springfield, Ill., has placed orders for 200 composite gondolas and 50 composite gondola bodies with the American Car & Foundry Company.

RICHMOND-ASHLAND RAILWAY, Richmond, Va., is reported as being in the market for two interurban cars. This company operates a high-speed service between the Old Dominion's capital and Ashland, a suburb 16 miles north of the city.

TRENTON & MERCER COUNTY TRACTION CORPORATION, Trenton, N. J., has been authorized by the Board of Public Utility Commissioners to offer $18,000 in notes to pay in part for the purchase of snow-fighting equipment.

NORTHERN TEXAS TRACTION COMPANY, Fort Worth, Tex., will supplement its service in Fort Worth with five new 21-passenger buses. Four buses of this kind already are in service in this city. A request for a permit to operate buses between Fort Worth and Dallas is now before the Texas Railroad Commission.

CAPITOL DISTRICT TRANSPORTATION COMPANY, bus-operating subsidiary of United Traction Company, Albany, N. Y., has asked the Public Service Commission of New York for approval of the purchase of twenty Mack buses.

PUBLIC SERVICE TRANSPORTATION COMPANY, a subsidiary of Public Service Corporation of New Jersey, has placed orders for fifty new gas-mechanical buses. Twenty of the new buses will be supplied by the American Car & Foundry Company; twenty by the Yellow Truck & Coach Manufacturing Company and ten by the White Company.

TRADE NOTES

W. W. WIXSON of the Bonney Forge & Tool Works, Allentown, Pa., has been appointed district sales manager of the central district. Mr. Wixson has long been connected with the company.

EARLE GEAR & MACHINE COMPANY, Philadelphia, Pa., anounces the opening of a New York district office at 95 Liberty Street, New York City. C. N. Walsh and George E. Barrett are in charge. The company also maintains a district office at 110 State Street, Boston, Mass., in charge of W. H. Allen.

O'FALLON COMPANY, 1418-24 Arcade Building, St. Louis, Mo., has been appointed direct sales representative of the Hyatt Roller Bearing Company, Newark, N. J. The O'Fallon Company will handle exclusively the Hyatt railroad journal box and roller bearings for steam railroad and electric railway use. The territory to be covered is the central southwest territory. The new representative will handle all solicitation and sales work from its St. Louis sales office.

ELECTRIC RAILWAY MATERIAL PRICES—AUG. 16, 1927

Metals—New York

Copper, electrolytic, cents per lb.	12.875
Lead, cents per lb.	6.70
Nickel, cents per lb.	35.00
Zinc, cents per lb.	6.713
Tin, Straits, cents per lb.	64.25
Aluminum, 98 or 99 per cent, cents per lb.	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.325
Somerset mine run, Boston	1.85
Pittsburgh mine run, Pittsburgh	2.02
Franklin, Ill., screenings, Chicago	‡
Central, Ill., screenings, Chicago	‡
Kansas screenings, Kansas City	2.675

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb.	2.85
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.90
Steel bars, cents per lb.	1.80
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb.	3.00
Sheet iron, galvanized (24 gage), cents per lb.	3.85
Galvanized barbed wire, cents per lb.	3.25
Galvanized wire, ordinary, cents per lb.	2.40

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	12–17.50
Colored	7–14

‡ Quotations withdrawn because of strike.

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.5
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal.	$0.64
Putty, 100 lb. tins, cents per lb.	5.25–5.50

Wire—New York

Copper wire, cents per lb.	15.25
Rubber-covered wire, No. 14, per 1,000 ft.	5.55
Weatherproof wire base, cents per lb.	5.20–5.70

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.00
Light copper, cents per lb.	9.50
Heavy yellow brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	3.875
Lead, cents per lb. (heavy)	5.50
Steel car axles, Chicago, net ton	$18.25
Cast iron car wheels, Chicago, gross ton	14.75
Rails (short), Chicago, gross ton	16.25
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.75

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
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CHARLES GORDON, *Editor*

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Newspaper Comment Favorable to Electric Railways Grows

PUBLICITY of a kind favorable to the electric railways continues to pile up in an unending stream in the daily press and in many of the magazines. This symposium is characterized by an intelligent discussion of what electric railways are trying to do. The New York *Times,* for instance, commented recently on the statement made by Lucius S. Storrs, managing director of the American Electric Railway Association, to the effect that during the past ten years more electric railway track has been built than abandoned; that there are many more cars in use today than there were a few years ago, and that cities like Des Moines, Akron and Bridgeport have gone back to trolleys after experimenting with buses. The *Times* even referred to the recent parade in Kansas City of refurbished cars, painted in gay colors and equipped with "noise absorbers," and ended with a plea to the effect that the alleged slowness of the trolley car was not an indictment of that vehicle, but only went to show that there are some conditions to which it is not well adapted.

Comment along similar lines was also contained in recent issues of the Cincinnati *Enquirer,* the Jacksonville-Florida *Times Union,* the Kansas City *Star* and the Louisville *Courier-Journal,* the last of which, reproduced in the JOURNAL for July 16, page 121, was particularly pertinent. In addition, the electric railways are more and more being made the subject of constructive criticism in the financial journals, notably the *Times Annalist,* the *Financial World* and the *Magazine of Wall Street,* and have come in for more and more attention on the part of writers dealing with the subjects of advertising and selling. Only recently J. C. Royle, a New York financial writer, said that the electric railways of the United States are spending $1,000,000 a day in extensions, improvements, betterment and new equipment. That fact was not new to the electric railway industry, but it was a point new to the clientele to whom Mr. Royle addressed his remarks. Its reiteration must necessarily be helpful. He was not content merely to set down the facts, but said that the record of expenditures made by the electric railways was one of the most conclusive answers to their future in this country. As he interpreted these figures, they gave evidence that the corporations themselves are confident of the ability of the roads to make money. They indicated to him that the financiers of the country agreed with the operators to the extent of being willing to underwrite the new financing necessary, and that the investing public saw sufficient safety and profit to buy the securities offered.

Not the least significant appreciation, of course, is the recognition of the excellent work in publicity and advertising by the electric railways noted in recent feature articles, notably in *Printers' Ink.* These dealt with the advertising program of the railways in Cincinnati and in Montreal. In still another article in *Printers' Ink* a writer discussed the disposition of the gross sum being spent by the public utilities for advertising. It is true that he referred more particularly to expenditures being made by the gas companies, but he did give full credit for the effective work by the electric railways. Among other companies that have conducted similar newspaper campaigns recently are the Boston Elevated Railway, United Railways & Electric Company, Baltimore; Chicago Rapid Transit Company and the Chicago, North Shore & Milwaukee Railroad.

It is very interesting to note that these programs of publicity and advertising were looked upon not so long ago by many in the industry as a last or a forlorn hope, but that they have now come to be accepted by all the progressive companies as absolutely essential to the proper conduct of their business. It may be many years before the merchandising and advertising efforts of the electric railways are as well organized as those of most mercantile businesses, but the electric railways have made rapid strides along these lines, considering that they were among the last of the major industries in this country properly to appraise the value of publicity and of the truism "It Pays to Advertise."

Training Should Have a Definite Objective

PROGRESSIVE railway executives are coming more and more to believe that it is desirable to secure young engineers and train them for positions of responsibility in the transportation industry. The idea is not new, as certain electric railways have had specialized training of college men for a number of years, but it is gaining ground all the time. The actual training of the young engineers presents no very serious problems. Since they were selected because of their interest in and adaptability for transportation work, the laying out of an apprentice course for these men is largely a matter of detail, with the thought in mind of giving them an inclusive picture of the workings of the entire organization. The day for specialization in a particular line of work will come soon enough—suffice it for the present that the student become familiar with the wheels which keep the tokens dropping in the fare boxes. But after that, what? The question remains as to just what is to be done with these earnest young college graduates after they have gone through the mill and are no longer cadets.

It is the height of folly to spend thousands of dollars in conducting such a course unless there is fair assurance that the best if not all the cadet engineers will remain with the company upon the completion of their training period. Obviously the company is giving all and receiving nothing during this course. From "green" college graduates, equipped with a mass of theoretical knowledge but with little or no practical training, the cadets are converted into engineers with a fair working

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knowledge of electric railway practice. At the end of the course their services will have a market value and there will be other companies quick to seize upon the erstwhile cadets and thus to profit by the knowledge which they have absorbed, unless the railway which gave the course has succeeded in painting a sufficiently promising future in its own fold.

Working in close touch with department heads, the director of the cadet course should aim to have definitely in mind specific jobs for his charges when they have completed their period of training. In some instances it might be well to choose the ultimate occupations of the engineer graduates according to the subjects of specialization during college courses. A civil engineering graduate would be a promising candidate for maintenance of way work, while electrical and mechanical graduates may be similarly allocated to activities with which they are familiar. While the enrollment each year in the cadet course may be selected to some extent according to requirements for engineering talent in various technical departments, the transportation department offers a broad opportunity for young engineers irrespective of their particular specialties. The main thing is to discover the bent of the individual during this course of training and see that he has a fair chance to do the kind of work he likes after its completion.

One Contented Passenger Is Worth Six Comely Ones

SOME few years ago, when the theory was advanced that riding the street car would cure insomnia, public acceptance of the idea, though negligible, was quiet in its reception and response. Later, when the quasi-scientists declared that vibration of the trolley car promoted better hearing, doubt and denial became more articulate. More recently another strain has been put on normal credulity with the announcement that the trolley is an aid to pulchritude—that a beautifying "current" enters the bodies of the passengers. From many quarters comes the loud cry—Bunk! Hokum!

In the ensuing discussion whether a daily ride in an electric-propelled conveyance enhances beauty and pep one comment ascribed to a Chicago railway official seems peculiarly pertinent: "It seems to me that 'L' riding should be the ideal cure for an ingrowing grouch. We've tried to demonstrate it many times. But there doesn't seem to be enough escaping electricity." Curing an ingrowing grouch or developing contented passengers by selling a real service seems to come more nearly within the province of railway merchandising than promoting the use of railway cars as beauty parlors.

A daily ride on an electric railway line will never serve as an instrument of beauty until it first injects into the rider the serum of contentment, satisfaction and pride in himself and in his public utility. Clean, freshly painted vehicles running on regular schedules with courteous and efficient crews are a more potent influence in the beautifying of passengers than all the electric currents running through the human body. In the last analysis a smiling passenger is a comely one, and all the mystic powers of stray electricity can't convert a disgusted and disgruntled rider into a thing of beauty. Beauty within will not beguile all men, though its expression is evident to the discerning eye. One of its alluring features is contentment. If more beautiful women are seen riding on the street cars today than in former times, an opinion held by some observers, the welcome change is directly attributable to the positive and concerted efforts on the part of far-seeing railway managers whose code for selling transportation recognized the rights of the rider to travel comfortably, conveniently and quickly.

The prophecy for electricity preventing milk from souring may yet be realized, but it will never convert a dour passenger into a satisfied customer. That's the job for a transportation salesman, not an electrical wizard.

Union Takes Its Fellows to Task in Unusually Frank Statement

SOUND reasons are advanced by the Amalgamated Association at Chicago in a protest against the general tenor of resolutions pertaining to the local franchise situation adopted by the Chicago Federation of Labor. In short, the organized railway men call into question the wisdom and justice of the federation's continuing to attack the local railways, particularly as no practical constructive alternative suggestion has been advanced. The Amalgamated was moved to do this in the best interests of the more than 20,000 union employees of the companies and in justice to employers who have had contract relations with the union for more than 25 years.

The protest of the men characterizes the trade union as an opportunist movement. It then says that it is only natural to expect that the railways when seeking franchises will try to get the best legislative deal they can, "just as our unions get the best conditions we can when negotiating contracts with them." If the public needs to be protected the Amalgamated would put the problem up to the elected representatives of the citizens. Incidentally, the primary lesson is read to its fellow federationists by the Amalgamated that the railway workers can hope to profit only as the railway for which they work profits.

In the wording of its protest the Amalgamated Association acknowledges that the management is merely the agent of the trinity of the public, the investor and the employee. The document sees the electric railway executives striving earnestly to operate on a legitimate business basis, and it says so to the apparent confusion of its less sober thinking affiliated labor body. Of course, the companies have their objectives, among them co-ordination, but that does not necessarily imply the preservation of an entirely selfish viewpoint. The Amalgamated asks for the industry by which its members gain their livelihood only the same fair play and consideration shown by the federation to other union industries. That certainly is reasonable.

Perhaps more than anything else does the present document serve to make plain the reason for the opposition to unionism so often publicly expressed. There is no quarrel with unionism, *per se*. Its tenets are good, but too often, far too often, unionism is insincere and destructive in its purpose. The present instance of the federation's position is certainly a striking case in point. The very fact that the Amalgamated found it necessary to take the stand it did emphasizes how the tenets and practices of unionism often part company.

The statement of the Amalgamated of its position in the matter is a rebuke of one union by another well deserved. It could not have been administered half so well

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by any other agency. But above that, and far more important, is the generous recognition by the union of the mutuality of interest existing between employer and employee, the acknowledgment made of the accomplishments of the Chicago railway management and the tone appreciative of the economic hardships of the industry of which the men are a part. Truly, the statement of the union is in many respects an unusual document.

Sale of Oklahoma Railway Significant

GREATER import than appears on its face attaches to the recent purchase of the controlling interests in the Oklahoma Railway from the Southwest Securities Company by H. B. Wright and his associates. First, the consummation of the deal is a tribute to the successful management of the company by the receivers and to plans laid carefully by the late John W. Shartel, who before his death in April, 1926, mapped out a campaign for restoring the railway to prosperity. Second, it confirms the fact that increasing attention is being paid to the electric railway on the part of bankers convinced of the possibilities of the securities of these companies when intensively conducted.

It is a great work that has been done in Oklahoma City in restoring this road. The facts about its purchase substantiate this, but the most tangible record of evidence is furnished by the results of operation during the last few years. It is expected that the net income of the property this year will be about $200,000. This compares with $50,000 last year and with earnings in 1925 that failed by $20,500 to meet operating expenses, interest and taxes. Of this record the receivers may well be proud. It shows what intelligent application of modern ideas will do toward the restoration of a property that a few years ago gave very little evidence of attaining so soon the degree of relative prosperity which has evidently been reached. There have been many other similar cases in the past showing the growing appreciation on the part of bankers of the potential possibilities of roads similarly situated, but the latest one is unusually significant because of the trials and tribulations which beset this particular railway.

Europe Offers Suggestions on Hiring and Housing Transportation Employees

THOSE who are unacquainted with European electric railway practice should find much of interest in the series of articles on that topic now appearing in the JOURNAL. Fundamentally, the character of equipment used abroad is very much like that in America, the resemblance being closer in the case of electric railways than with the steam railroads. The problem facing railway managements on the two continents also is the same, namely, first to attract passengers and then to carry each of them safely, comfortably and quickly to his journey's end.

In working out this problem many European companies have developed methods which are different from those followed in this country. Some are necessarily so, because the circumstances here and abroad are not the same; others constitute simply another way, sometimes a shorter way, of reaching the same goal. It is these latter methods particularly which may offer suggestions of a practical nature to American railway and bus operators.

The article in this week's issue relates to the engagement of transportation employees and their relation to the operating property after they have joined its forces. In some respects, particularly in connection with psychological examinations of this class of employee, several of the European electric railway systems have made marked progress. Their records also indicate that definite benefits follow examinations devised to test such applicants for the special qualities required of motormen and bus drivers.

The extensive housing program conducted in Berlin probably is less susceptible of application in this country. As the Berlin Street Railway is owned by the city and as municipal housing undertakings are not uncommon in Europe, it has proved practical in Berlin to carry on electric railway housing to a very large scale. Nevertheless, as the article explains, some rather extensive buildings of this kind have been erected by private companies also.

The practicability of similar plans under American conditions is open to question. It may be argued that the average transportation employee here would prefer to select the locality of his home himself, even if it meant living in quarters not so desirable. But if such extensive housing plans seem somewhat too ambitious, it may be that the method followed by a great many European roads of having certain responsible officers live near large operating carhouses is not out of the question. There are precedents, of course, among professionals, notably physicians and clergymen, whose homes adjoin or form part of the building in which they perform their duties. In such cases, the opportunity of occupying a parsonage or rectory or having living quarters in a hospital where one has to work is considered a privilege. Why should it not be the same in connection with electric railway operation?

Celtic Courtesy on a New York Street Car

IT OCCURRED on a 42d Street crosstown car of the Third Avenue Railway, New York. Two friends had boarded, the first of whom dropped fare for both in the farebox. The second did not notice this and therefore dropped a third nickel for himself.

Thereupon passenger No. 1 expostulated with passenger No. 2 on his unwarranted generosity in giving the railway double pay. That third nickel was deemed as lost to them forever, since neither passenger expected the conductor to violate the rule against fishing in the farebox or handling any money intended to pay fare.

But they reckoned without the Celtic wit of the conductor. He had heard their colloquy about the extra nickel, but had offered no remarks. He just bided his time. A minute or two later when a patron of obliging mien came along he must have been accosted with: "Don't drop your nickel in the box. Please give it to that chap over there. He overpaid." And the patron of the obliging mien did so!

Here is a case where a nimble mind leaped over the barriers of formal, though necessary, regulations. The Third Avenue Railway System is to be congratulated on having a man of this type. Here's wishing the company many more of them, whether they are selected by intelligence tests or by shrewd employment directors who disbelieve Shakespeare's statement that "There's no art to find the mind's construction in the face."

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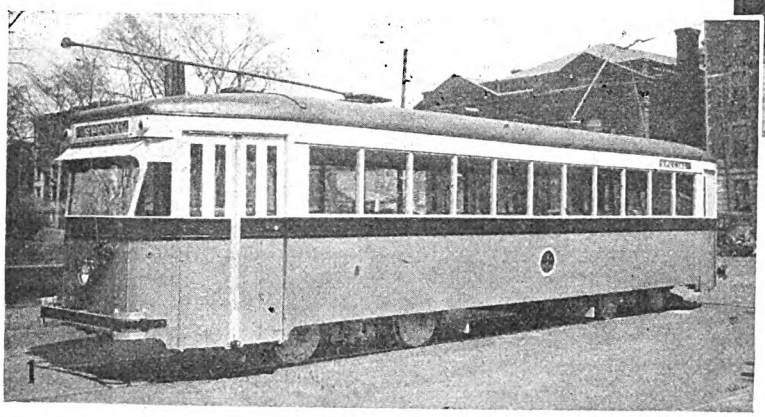
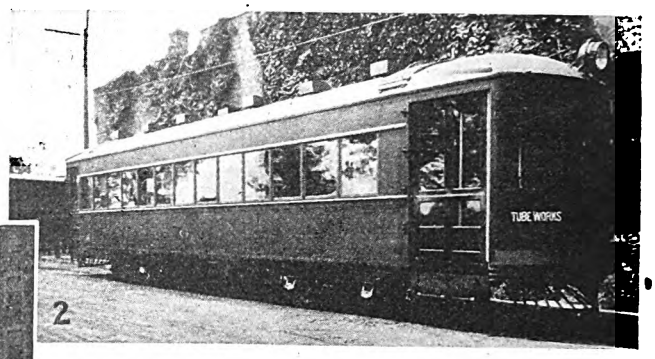
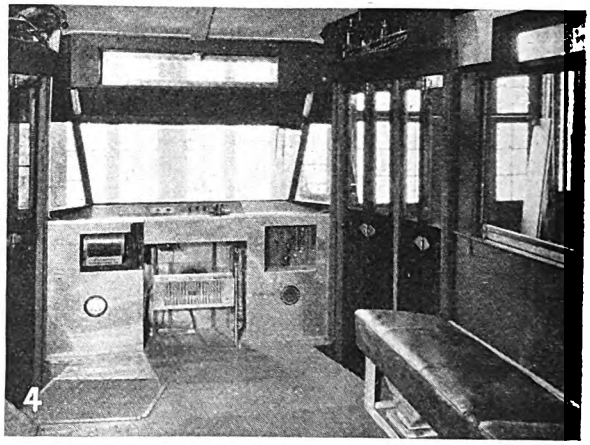
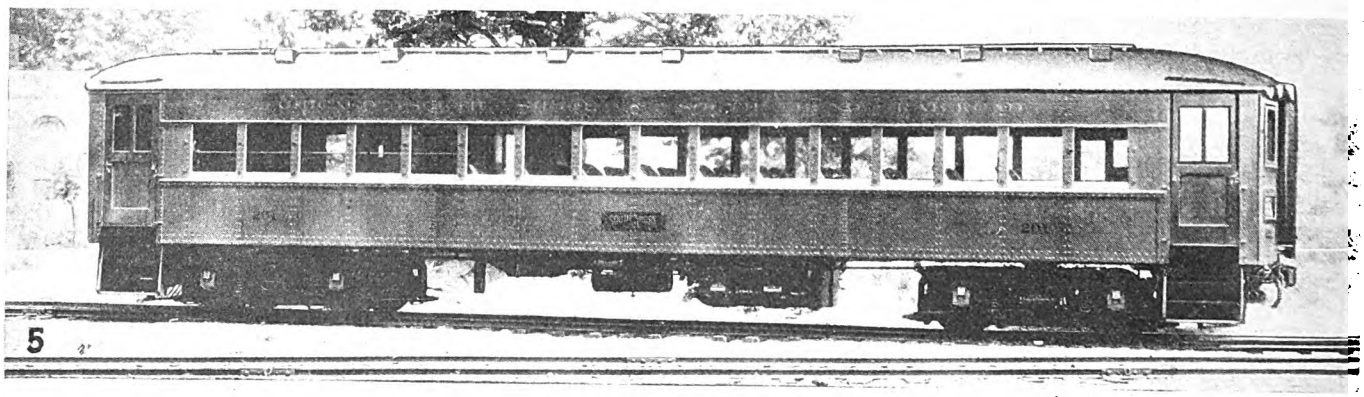
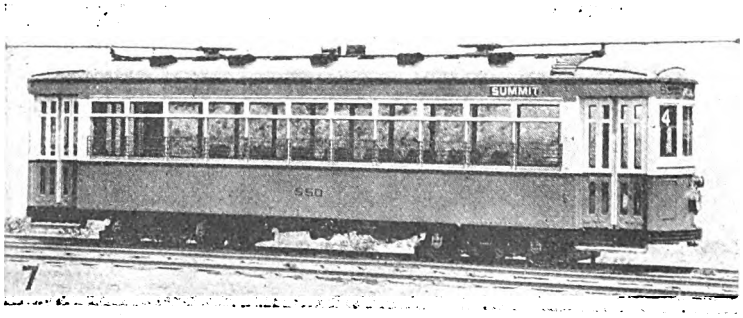
Radical Improvements in Design Characterize Some of the Most Recent Cars











1. *The latest innovation in car design is seen in the Springfield test car. Note the bus type front.*

2. *With nine of these handsome city type cars the Gary Railways is out for increased patronage.*

3. *Spacious interior of the South Shore's new units.*

4. *Aluminum control cabinet in front of the Springfield test car.*

5. *The Chicago, South Shore & South Bend's latest feature in equipment is built for speed and passenger comfort; twenty of these all-steel units, ten motor and ten trail cars, were delivered during the last week of July and the first fifteen days of August.*

6. *The desire to furnish utmost passenger comfort is evinced by this typical interior view of the Worcester-Springfield units.*

7. *Worcester and Springfield, Mass., will soon have 50 cars each of this design in operation. They are of the light-weight, one-man, city, semi-steel type.*

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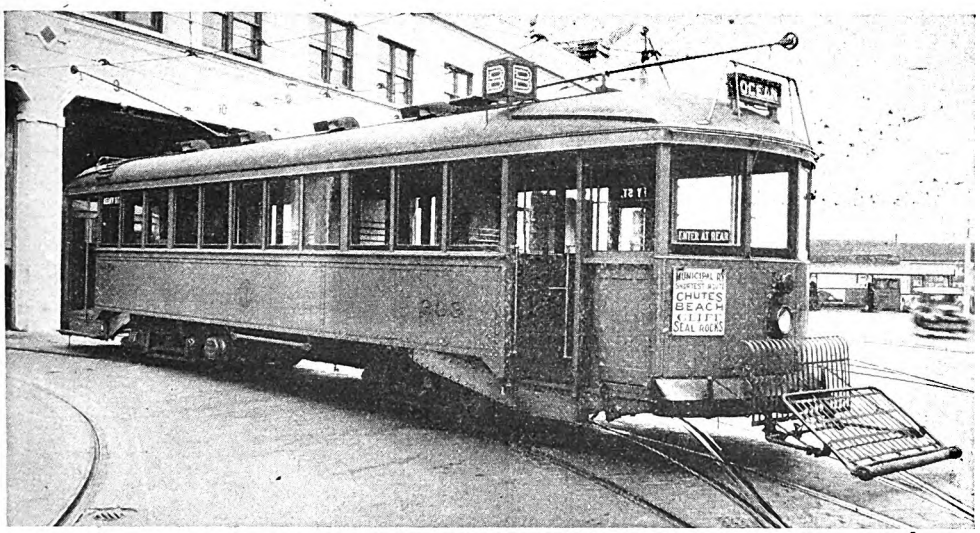
Seven Months of
CAR BUILDING

Trend is toward de luxe equipment, easier riding and noise reduction. Definite effort to improve the lines and appearance of the new cars is being made

By G. Watson James, Jr.
Assistant Editor *Electric Railway Journal*

MR. JAMES, *who has followed closely the activities and developments in new electric railway equipment in connection with his work as editor of the Manufactures and the Markets section of* ELECTRIC RAILWAY JOURNAL, *presents here an analysis of car building activities and possible trends in construction as revealed during the last seven months.*



Fifteen of these units have recently been delivered to the Municipal Railway of San Francisco. They have a seating capacity of 50 passengers. An order for ten additional cars of the same design was placed in June

ACCORDING to a recent survey conducted by ELECTRIC RAILWAY JOURNAL, twelve of the leading car builders in the United States and Canada report a total of 308 electric railway cars for city and interurban service (including trailers) as ordered to June 1, 1927, as against 649 units ordered up to June 1, 1926. In its forecast for 1927 this paper predicted an approximate car budget of $55,000,000, which was an increase of $15,000,000 over that spent in 1926. At the time of making this forecast, opinion was expressed that the greater portion of the $55,000,000 would be expended for new cars.

With these data as of June 1 available, a general survey of the car building situation can be made to determine the trends and the prospects for the immediate future. The latter already show a distinct tendency toward increased activity when the figures from June 1 to July 30 are first considered.

Since June 1, 1927, Detroit has ordered 125 Peter Witt cars; San Francisco ten new cars in addition to the units recently delivered; the Chicago, North Shore & Milwaukee Railroad ten one-man, two-man, 51-ft., 40,000-lb. units, seating 56 passengers each, two of the cars to be equipped with Timken bearings, and the Chicago, Aurora & Elgin fifteen de luxe semi-steel units. Coupled with definite orders are rumors of imminent orders from Seattle and other cities, depending on removal of civic and other difficulties. In this picture, the Boston Elevated looms up with an inquiry for ten convertible cars, Pittsburgh is preparing specifications for ten light-weight interurban units, and persistent rumors center around the Cleveland Railway as the purchaser of 100 units.

Car purchase figures for this year are further reinforced by the 60 electric passenger units and 30 trailers now being turned out by the American Car & Foundry Company for the Long Island Railroad, as part of that carrier's extensive all-steel car program.

SOME DELIVERIES AND ORDERS SINCE JAN. 1

The new year had hardly taken its first breath before Birmingham received sixteen single-end, double-truck center-exit units, conspicuous for their decorative and noise-reducing design. Then came the five light-weight cars for Williamsport, Pa. Tampa was next reported as having received ten cars. During January, also, was reported an order for twenty units by the Chicago,

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South Shore & South Bend Railroad, 50 de luxe units for the Eastern Massachusetts Street Railway, nine lightweight cars and one interurban unit for the Gary Railways; the delivery of twelve one-man, 35,000-lb. units to the Scranton Railway, and of seven new interurban 46-passenger, double-end, one-man-operated units for the Gary Railways was also noted. With February came the Rockford & Interurban Railway's order to the American Car Company for seven semi-steel interurban cars seating 52 passengers each, specifications for which were announced in the July 30 issue of ELECTRIC RAILWAY JOURNAL. In this month the Chicago, Aurora & Elgin announced an order for fifteen new de luxe all-steel interurban units weighing 102,000 lb. for one-man, two-man, double-end operation and having Baldwin equalizing trucks, straight and automatic air brake systems, plush seats with leather trim and 37-in. wheels. Chicago received 33 cars for multiple-unit operation, and the Cincinnati, Hamilton & Dayton launched its rehabilitation program with orders for ten all-steel high-speed interurban cars, which have been described in recent issues of the JOURNAL along with a subsequent order for ten double-truck, de-luxe, one-man cars. From the South come advices that the Mississippi Valley Public Service Company has added two one-man cars to its equipment. In the small order class during this month were four double-truck 26,000-lb. one-man cars for the Fitchburg & Leominster Street Railway, Fitchburg, Mass., and five 50-ft. passenger and smoking car bodies for the Philadelphia & Western Railway. In this month also there was the first news that the Montreal Tramways was to purchase 25 motor and 25 trail cars. These cars, subse-

SOME IMPORTANT REHABILITATIONS REPORTED SINCE JAN. 1

Name of Company	Number of Units Rebuilt	Nature of Work
Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.	45	Remodeled two-man cars for one-man operation, platforms changed, equipped with National Pneumatic and safety car devices.
Eastern Massachusetts Street Railway, Chelsea, Mass.	50	De luxe type reconstruction details not given.
Reading Rapid Transit, Reading, Pa.	1	Rebuilt two steel frame cars.
Market Street Railway, San Francisco, Cal.	73	Cross seats, leather cushioned, smoking compartment glassed one side, open on the other.
Southern Public Utilities Company, Charlotte, N. C.	6	Built 18-ton, 40-passenger car body.
Western Ohio Railway, Lima, Ohio	1	Chair car, bucket type chairs, plush covered. Smoking compartment chairs finished in Spanish leather. Reconstruction plans call for one rebuilt car a month.
Memphis Street Railway, Memphis, Tenn.	65	Redesigned front platforms, low line type folding steps, treadle-operated doors, single and one-man operation, front and rear exit doors. $130,000 outlay. Rebuilt units purchased in 1914 and 1923.
Cincinnati Street Railway, Cincinnati, Ohio	21	Remodeled 21 P.A.Y.E. Installed cross seats, leather upholstering, mahogany and cream color cheme, Railway Utility Chromalox heater under seats, painted trucks, and roof. Electric Service Supplies air-operated sand valves.
Williamsport Railways, Williamsport, Pa.	32	Rebuilt to conform with the five new 42-ft. 2-in. one-man, two-man double-end operated cars, described in the JOURNAL Jan. 8 issue, page 103, also see April 23 issue.
Atlantic City & Shore Railroad, Atlantic City, N. J.	Several, exact number not given.	Plush seats for cane. Step brought within body width, O. M. Edwards drop step, new Pantasote curtains, refinishing cherry woodwork. Sash in monitor deck sealed and Garland ventilators installed. Magnesite flooring laid over old wood floor, laid on wire mesh. No. 16 sheet steel placed over original wood sheeting, 1,000 lb. increase in weight of car.
United Electric Railways, Providence, R. I.	Number not given.	Extensive work on all old cars. Suburban cars—refinishing woodwork, seats upholstered in Spanish leather, white enameled Rico hand strap, cross seats for longitudinal.
East St. Louis Railway, East St. Louis, Ill.	6	Completely stripping cars, welding and replacing defective side plates and underframes, old mahogany finish refinished, natural color headlinings installed, metal trimmings refinished, new seats, spring cushions and backs covered with green Kemi-suede, new motors, rewiring, full safety apparatus including LD-4 devices for operating line switches, four air-operated doors, steps lowered, 12 to 13 in. streamline effect by painting.
Detroit, Monroe & Toledo Short Line Railway, Detroit, Mich.	All rolling stock	Individual automobile seats.
Public Service Railway, Newark, N. J.	24	Bucket leather seats replacing longitudinal cane seats, spring hand straps, 12 ft. well in front of car. New color scheme of maroon, and cream.
Northern Ohio Power & Light Company, Akron, Ohio.	115	Remodeled 41 composite city cars to Peter Witt type, front entrance door enlarged, emergency exit provided operated by separate engine, full safety appliances installed and center door cut in units. Step arranged to act as treadles, rear platform cut off 3 ft., circular seat installed around rear end. Rattan seats padded and covered with leather. Trucks overhauled, gear ratio of motors reduced and helical gears installed. 74 Peter Witt cars arranged for one man operation safety appliances. Oskelite equipment treadle door.
Rochester & Syracuse Railroad, Syracuse, N. Y.	5	Seats upholstered in leather, trucks overhauled, rubber tile flooring, 5-ft. plate glass windows, maroon gray striped velour chair covers. Leather, deep-cushioned chairs in smoking compartment.
Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.	1	Remodeled interurban coach in company's shops, special reading lamps, air cushioned non-reversible chairs covered with moiré plush, battleship linoleum, four 100-hp. motors.
Virginia Electric & Power Company, Richmond, Va.	16	Modernized sixteen of its double-truck cars from two-man to one-man operation to conform with ten new cars recently delivered. Leather upholstered seats, safety car appliances, new platforms, piping for door control concealed, rubber tile flooring, porcelain hand-hold strap, sixteen single-coil cylinder-type heaters in car body and two double-coil heaters in each vestibule—$100,000 program.
Chicago, South Shore & South Bend Railroad, Chicago, Ill.	2	48 Hale & Killburn bucket type seats upholstered in brown and gray striped velour, replacing old hard leather seats of reversible type. Pullman type dome lights, cabinets for hot water heaters, multiple-unit control apparatus.
Kansas City Public Service Company, Kansas City, Mo.	746	Extensive modernization. Linoleum tile flooring cemented to a base of builder's felt and canvas covering for floors, except in aisle, flexible composition matting in aisle, seats upholstered in maroon Kemi-suede placed over felt padding, aluminum seat end brackets. Frosted lamps directly over seats. Streamline exterior. sanitary hand straps. Improved controller equipment, air rectifiers to prevent freezing. Thermostatic control for heaters. K-35 controllers replace K-14 previously used.

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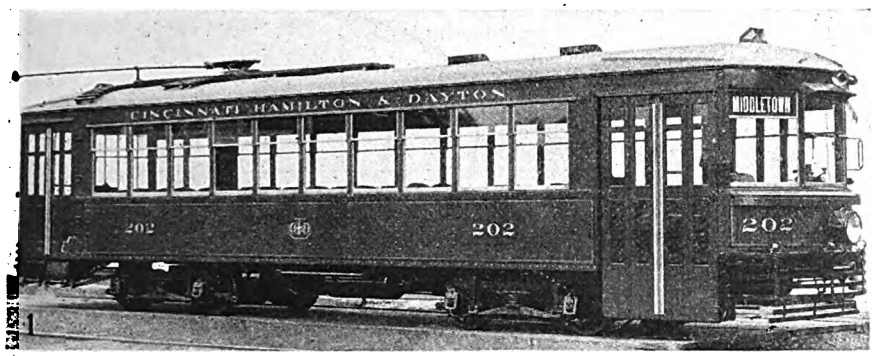
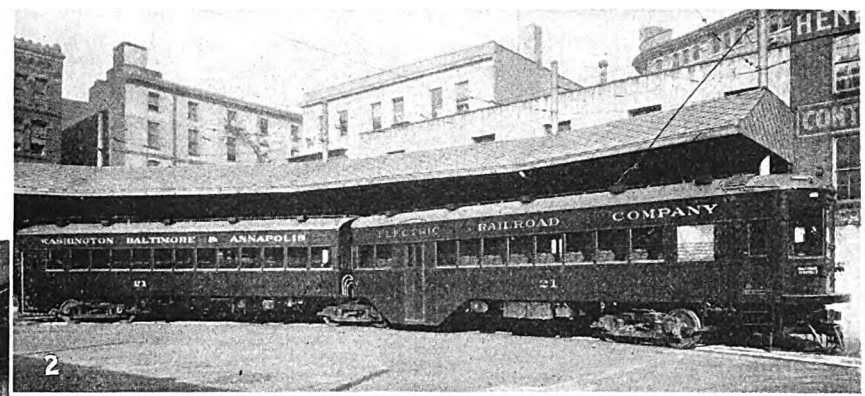
quently ordered from the Canadian Car & Foundry Company, are of the 44-passenger city type, weigh 36,000 lb. each, equipped with Westinghouse variable load brakes, rattan seats, 42-hp. motors and 26-in. wheels. They are 40 ft. 2 in. x 8 ft. 3 in.

The JOURNAL announced in its first issue for March the placing in service on Feb. 20 of four all-steel parlor-observation and dining cars by the Chicago, South Shore & South Bend Railroad. These units, built by the Pullman Car Company, are 64 ft. x 10 ft., equipped with



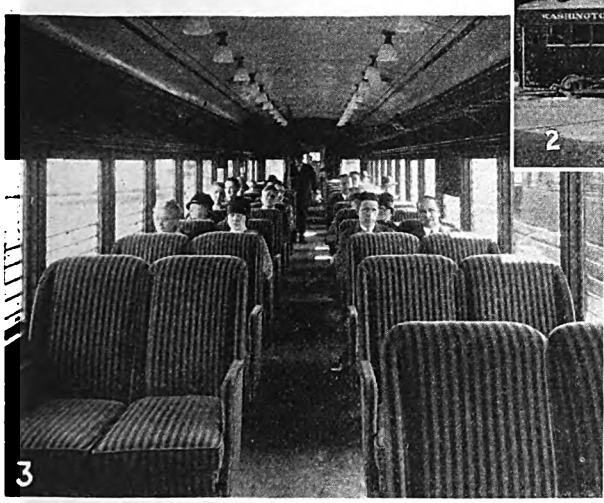
1. Ten city type units of this de luxe design were a part of the C., H. & D.'s new rolling stock order. These have an over-all length of 41 ft. 5⅝ in.

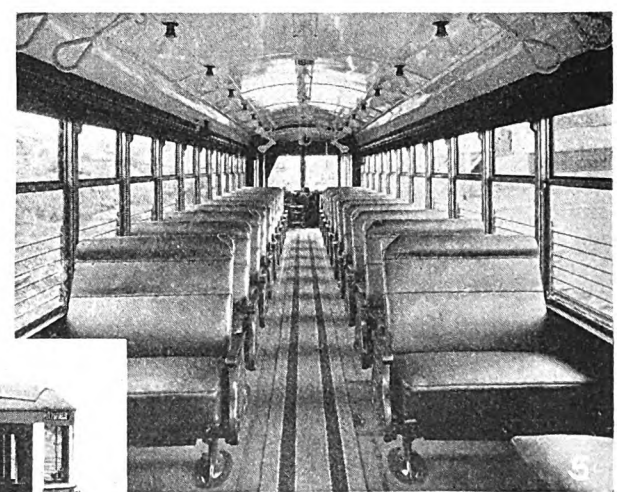
2. Vying with the Joliet and Springfield experiments, these high-speed articulated cars of the Washington, Baltimore & Annapolis Electric Railway were the sensation in car circles during the past seven months.

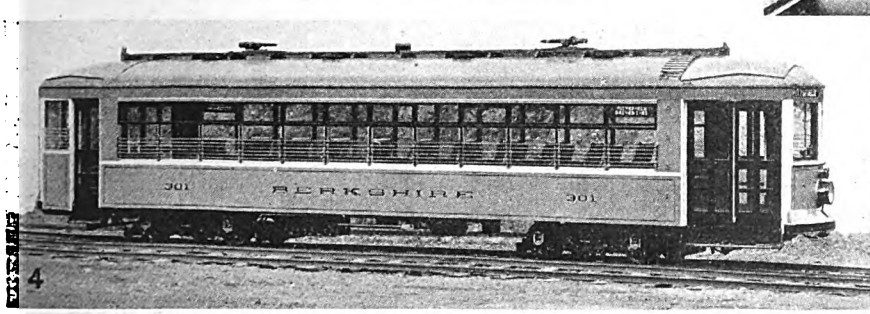


3. In the lap of luxury. Interior of the W., B. & A.'s articulated train.

4. New Berkshire railway units. These were built in accordance with the recommendations of the A.E.R.A. committee on essential features of modern cars.

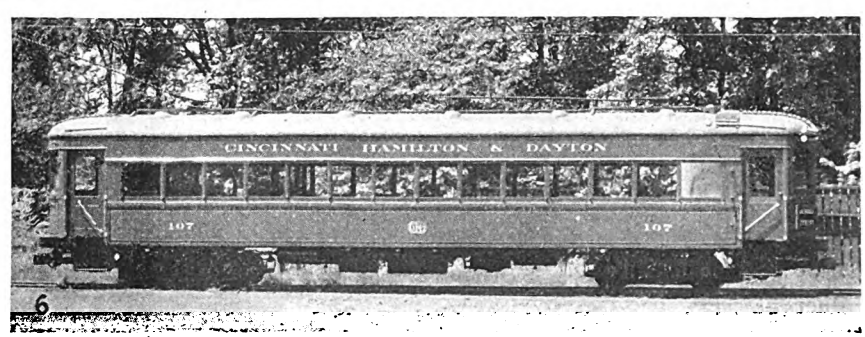






5. Plenty of light and seat space characterize these cars of the Berkshire Street Railway.

6. Double-end interurban car of the Cincinnati, Hamilton & Dayton Railway recently placed in service as part of its extensive rehabilitation.



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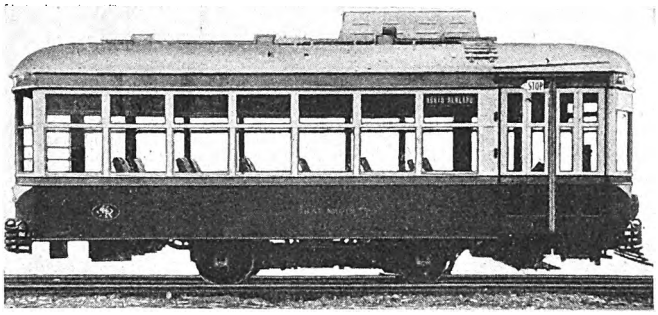
six-wheel trucks, glass-inclosed observation platforms, built-in lavatories, writing desks, magazine tables and a complete kitchen for buffet service.

At the same juncture the Twin City Rapid Transit Company announced that 25 noiseless cars were being built in the St. Paul shops at a cost of $155,000. Then came the inauguration by the Washington, Baltimore & Annapolis Railroad of a high-speed service between the capital of the nation and Baltimore, made possible by ten articulated units. These cars, with a combined section length of 97 ft. 4 in. and a total seating capacity of 96 passengers, represent the first extensive application of articulated car construction to high-speed interurban service. They are of center-door exit and entrance type, each section with 35-ft. 10-in. truck centers and 36-in. diameter wheels. Each unit averages 58⅓ tons, which is a saving in weight of 27 per cent over the old 40-ton equipment. Three trucks against four and one set of motors and control equipment as against two made a substantial saving in first cost and are expected to reduce both equipment maintenance and track maintenance. The month closed with the placing of an order for eight

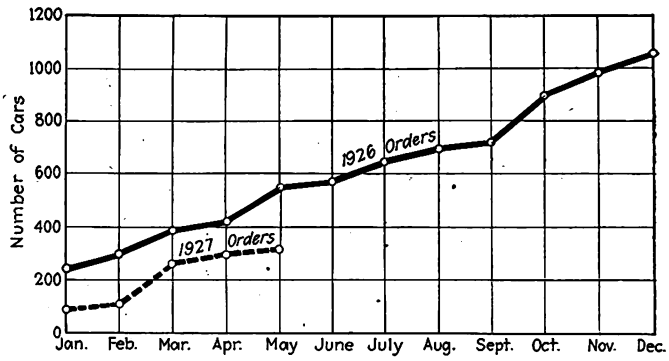


Eight 30-passenger safety cars, weighing 19,000 lb., of de luxe type were the recent choice ot the Jamestown (N. Y.) Street Railway when considering new rolling stock

double-truck, one-man cars by the Beaver Valley Traction Company.

In the March 26 issue of the JOURNAL the previously rumored order for 100 double-truck, city-type, lightweight, one-man, two-man cars for the Worcester and Springfield properties was announced, 50 cars for the Worcester company going to the Osgood-Bradley Company and 50 for the Springfield utility to the Wason Manufacturing Company. These units represent an expenditure of $1,650,000. They are 40 ft. 8 in. x 8 ft. 4 in. and will seat 48 passengers each.

In April, twelve double-truck interurban units of dimensions corresponding to the recommendation of the A.E.R.A. committee on essential features of modern cars were delivered to the Berkshire Street Railway. The Southwest Missouri Railroad ordered one 50-ft. double-end car and the Fitchburg & Leominster Street Railway received the four cars previously mentioned in this article. Six two-man, single-end cars 45 ft. 11 in. long, weighing 29,000 lb., were delivered to the Porto Rico Light & Power Company by the Perley A. Thomas Car Works; also ten cars of the one-man, two-man, single-end, double-end type were delivered at Norfolk, Va., to the Virginia Electric & Power Company. These units are 48 ft. 8½ in. by 8 ft. 5 in. In April the Georgia Power Company placed a 40-car order with the Cincinnati Car Company. These units are to be of the one-man, city-type, all-steel, 48-passenger design, 46 ft. 4 in. long. Ten cars will be equipped with Timken roller bearings. This contract was followed by orders

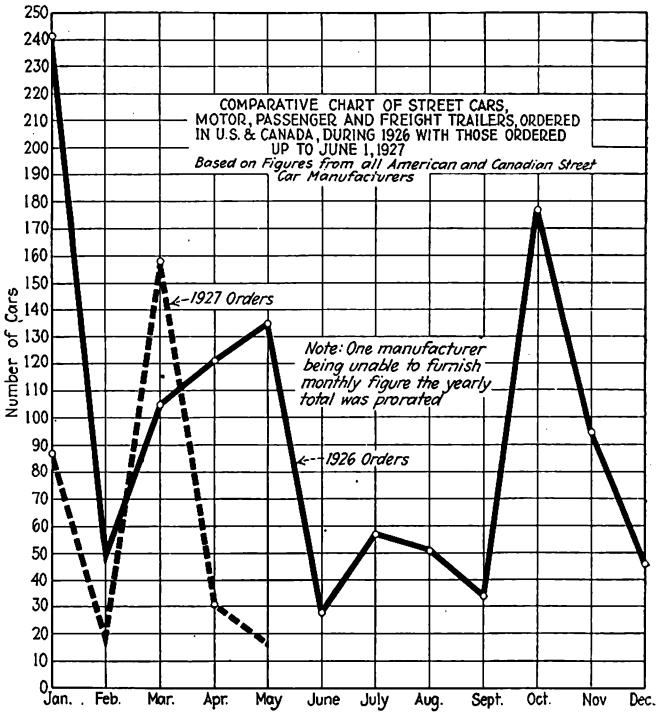


Cumulative orders of street and interurban cars in the United States and Canada, 1926 and 1927

from the El Paso Electric Company for seven 39-ft. 11½-in., single end cars, six interurban one-man, two-man, double-truck cars for the Interstate Public Service Company and four 44-ft. 11½-in. double-end units for the Galveston Electric Company. Contracts were signed with the American Car Company, G. C. Kuhlman Car Company, and the J. G. Brill Company respectively. Delivery was made in April and May of eight one-man two-man units to the Honolulu Rapid Transit Company, Ltd., on an order placed in December.

Included in the car picture for June were the eight de luxe safety cars built by the St. Louis Car Company for the Jamestown Street Railway, Jamestown, N. Y. These units, weighing 19,000 lb., seating 30 passengers, 27 ft. 7 in. x 8 ft. 8⅜ in., with 26-in. wheels, are of the noise-absorbing design. The floors are covered with inlaid rubber tiling, each unit has an operator's double-heated cab, and the motor rheostats usually installed beneath the car floor are located on the roof.

With a final delivery date set for June 15, the complete specifications for the 50 de luxe semi-convertible semi-steel cars ordered on Jan. 5 by the Eastern Massachusetts Street Railway were announced in the JOURNAL for June 11. These units are 43 ft. 9 in. x 8 ft. 2 11/16 in.



Comparison of monthly orders of street and interurban car orders, 1926 and 1927

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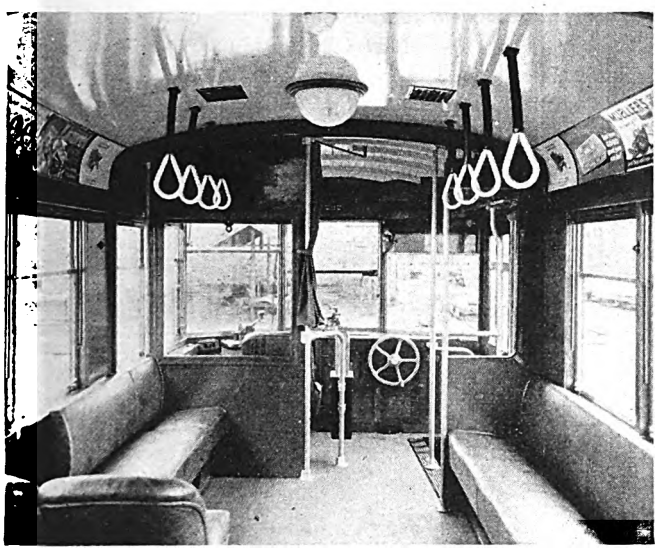
They are equipped with four GE-265 motors, Westinghouse SM-2 air-brakes with safety features and variable load devices. Heywood-Wakefield deep-cushioned divided-back seats, battleship linoleum floor covering, Economy meters with inspection dials, and Timken roller bearings on two of the units, are some of the other interesting design items. The Wason and Osgood-Bradley companies shared this order.

In June also specifications were reviewed for two one-man, city-type, double-end, 32-passenger cars for the Mobile Light & Railroad Company and two one-man, two-man, semi-steel interurban cars for the Greenfield & Montague Transportation Area. The latter are equipped with Westinghouse 510-E, inside-hung motors and are 39 ft. x 8 ft. $2\frac{11}{16}$ in. On July 9 specifications were released by the East St. Louis Railway for six one-man, two-man cars, these units to supplement its recently rebuilt rolling stock. July brought advices that the Ottawa Electric Railway had ordered twenty one-man, two-man, single-end cars, weighing 38,000 lb. and seating 47 passengers.



Looking toward motorman's position in the new Dayton cars of the C., H. & D. The steel panel affords privacy for the operator without destroying the passenger's view

The new car situation just reviewed does not include the twenty high-speed units which have been delivered to the Chicago, South Shore & South Bend Railroad, nor does it take cognizance of the design of the fifteen 50-passenger semi-steel cars recently delivered to San Francisco.

Trends in Design

Trend in design as shown by the car specifications of 1927 and by several experiments, notably those on the Springfield and Joliet properties, point to the light-weight, noiseless, de luxe-appointed units. The articulated car for heavy interurban and rapid transit service has become an important factor, due to the evident success of the Washington, Baltimore & Annapolis installation and the large scale application of this type of construction by the Brooklyn-Manhattan Transit Corporation. Here, light weight and noise reduction, speed, power economy, conservation in motors and control, combined with improved riding, are the objectives sought. Both for interurban and city service there is a strong tendency toward the use of seats upholstered in leather or plush, and designed for the maximum of passenger comfort. In many instances the trend is toward individual seats or revolving chairs. The recent installation in Pittsburgh of luxurious individual chairs on an experimental car for city service is a particularly noteworthy departure. Many recent cars are characterized by attractive fittings, treadle doors, safety appliances, lower level steps, more artistic color schemes, streamlines, and attention as never before to the elements of appearance and attractiveness.

No discussion of trends is complete without considering the epoch-making experiments of the Springfield Street Railway and the Chicago & Joliet Electric Railway. As stated in the Journal for March 19, precedent was cast aside in the Springfield design. Briefly, this car, which was successfully tested in May, embodied an inclosed automotive type worm drive, internal expanding brakes, four Westinghouse V-91B high-speed, 300-volt motors, two connected in series and full spring suspended in the truck frames. Removal of the motor from the car axle permitted the use of armature speeds that made possible a substantial reduction in motor weight for a given output. Total weight of one truck and two motors was only 5,650 lb. Unusual success attended the effort to improve the appearance and lines of the body design. Test of this car revealed a decided reduction in noise, not only along straight track, but around curves and over special work. As was pointed out at the time the new car weighs only 25,300 lb.

Pictures reproduced in this article are worthy of considerable study by those interested in body trends.

Almost simultaneously with the Springfield experiment was the one undertaken by the Joliet company when worm-drive trucks surmounted by a regular city car body were tested, as a preliminary to their being mounted with a duralumin body now being manufactured by the Cummings Car & Coach Company. When this car is assembled it will embody the following features: Gear reduction of $8\frac{1}{2}$ to 1, truck completely equipped with two Westinghouse V-91B motors having a one-hour rating of 35 hp., and with brake apparatus will weigh only 5,328 lb. The unit is designed for one-man, two-man operation and to seat 51 passengers. The body is estimated to weigh 14,000 lb. with all equipment. With the two trucks, this will bring the total weight to 24,600 lb. Instead of a floating bolster as employed on the Springfield car, the Joliet trucks have a stationary bolster. In the test of these trucks with the old body, there was developed a maximum speed of 34 m.p.h.

In so far as trends and actual car building are concerned a new note of optimism is being sounded in the preliminary announcements of car exhibitors at the coming American Electric Railway Association convention at Cleveland in October. In this particular there seems to be general activity among car builders, and some operators as well, looking to fundamental developments in design which will improve street car performance. The objectives appear to be a reduction in unsprung and total weight, less noise and pounding on special work. Scientific painting is utilized to emphasize the streamline effect and add attractiveness to the transportation vehicle.

Rehabilitation Work Reported in 1927

To this record of complete car construction must be added the tabulation of rehabilitated rolling stock which points conclusively to the wide and rapidly increasing interest being taken in the improvement of the industry's cars.

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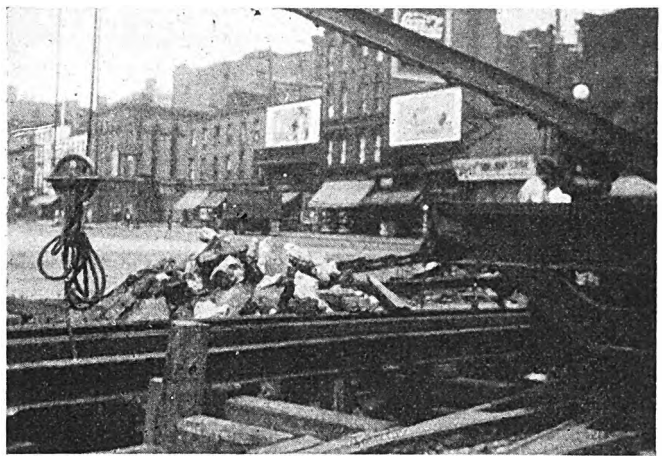
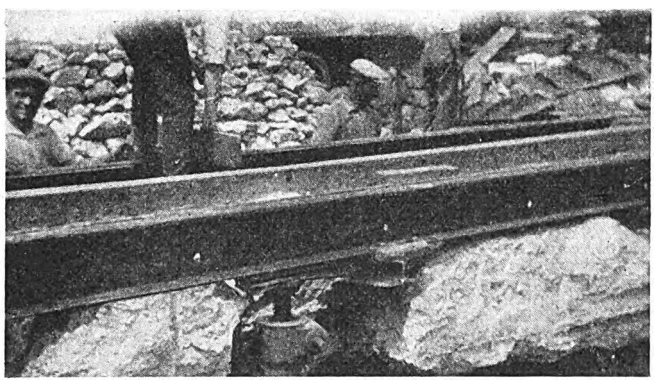
Track Raised to New Street Level

RAISING a 200-ft. length of underground conduit track crossing a busy street in New York City and removing the track paralleling this was the problem confronting the New York Railways when the city decided to place new paving over the old on West Street, raising the street level approximately 12 in. The line which crossed West Street was a double-track spur along Christopher Street, terminating at the Hoboken Ferry depot of the Lackawanna Railroad, on the opposite side of West Street. The yokes with the girder rails and the conduit were imbedded in concrete and, to make the problem more difficult, a double cross-over in the middle



Portion of the raised track held in place at the desired level by wood blocks, ready for filling in. Track to be removed with service car and crane in the foreground



Blocks and screw jacks were used to raise the track to the new level. Concrete between the yokes was not removed unless loose

of the street had to be contended with. Since rail traffic on the spur no longer warranted a double track to the depot, only one of the tracks across West Street was raised, the other being removed entirely.

The track which was to be removed was used for a service car with a crane and other compressed air equipment and was not removed until the other track had been aligned in its new position.

The track to be raised was separated from the street by using concrete breakers and excavating underneath the track its full length. The concrete was removed entirely at each yoke, but where it hung to the rails between the yokes it was not broken. This will be seen in an accompanying illustration. Screw jacks were used to raise the track and wood blocks to hold it at the new level. Jacks were also used to straighten the track when raised and to level the rails previous to filling in. The pieces of concrete removed were used as filler and were tamped thoroughly to make the base sufficiently solid. Fresh concrete completed the fill and was used to form the tube. The new paving has an 8-in. concrete base upon which will be set 4-in. granite blocks.

Economic Protection Assured

Novel group policy in Cleveland includes life and disability insurance, retirement pensions and benefits for sickness or injury

BY MEANS of a comprehensive system of life insurance the 5,000 employees of the Cleveland Railway, Cleveland, Ohio, are covered by protection from nearly every angle with the sole exception of unemployment. The plan recently adopted provides life insurance, double indemnity in case of accidental death, a lump sum for dependents of employees who are maimed, financial assistance in times of sickness and accident and establishes a pension system enabling old employees to retire. The contract, underwritten by the Metropolitan Life Insurance Company, will be paid for by the Cleveland Railway. The rest of the program is co-operative, with the cost being shared by the corporation and participating employees.

For the purpose of the insurance, the employees are divided into five salary classifications, styled A, B, C, D and E. Employees in class A are those receiving an annual salary or wage of $1,500 or less; class B includes workers receiving from $1,501 a year up to $2,100; class C consists of employees getting between $2,101 and $2,700 a year; class D is composed of those receiving between $2,701 and $4,500 annually, while employees in class E are those who receive $4,501 or more a year.

Under an earlier contract the employees were covered by group life insurance. The new contract provides employees in all classifications with the same amount of additional life insurance, each receiving $500, the entire cost of which is being paid by the Cleveland Railway.

Employees in class A receive $1,500 accidental death and dismemberment insurance, sick and non-occupational accident benefits of $12.50 a week for a specified maximum number of weeks, and retirement benefits, or pensions, commencing after 25 years of service at the age of 65, amounting to $1.20 for each year they have been with the company. Disability benefits, under the retirement plan, are payable in case of total and permanent disability, after twenty years of service. They will total $1.20 a month for each year of service up to the time of disability.

In all the other classes, the sick and non-occupational accident benefits are $20 a week, while the accidental death and dismemberment insurance is uniformly fixed at $2,000. The pension benefits, at the age of 65, after 25 years of service, range from $50 a month for employees in class B to $120 a month for those in class E, while the disability benefits under the pension arrangement, payable if total and permanent disability develops after twenty years of service, range proportionately for each year of service up to the time of incapacitation.

Employees in all classes, except class A, also are covered by an occupational accident provision. If an employee is injured while at work benefits will be paid similar in amount to those provided under the non-occupational accident clause, the difference between them and the benefits established by the workmen's compensation act being paid by the insurance company.

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Increasing Speed with Safety

By E. J. McIlraith
Staff Engineer Chicago Surface Lines

The author, speaking before the meeting of the Transportation Section of the Wisconsin Utilities Association held at Milwaukee on Aug. 18-19, points out that many sources of delay to public transportation vehicles are within the control of the operating company. These can be reduced and many of them can be eliminated by closer attention to details. The average speed can thus be increased without any change in the maximum speed and without introduction of an added accident hazard.

SPEED seems to be in great demand today, and safety may be important to some of us. But our habits today are to drive automobiles for our personal convenience, and we are just as likely to use an automobile when a street car would serve as well or better as is any other citizen. Use of a luxury as if it were a necessity is a common extravagance.

Now I am to talk of increased speed as if we are vitally in need of greater speed to keep up with the procession. I would rather turn it around and get the same result by calling the subject "Reducing Waste of Time," or "Cutting Down Street Delay," or, perhaps, "Improving Street Usefulness."

Today, especially in the larger cities, there is real necessity for more adequate regulation of street use. The volume of traffic has grown tremendously, and our impatience over the waste of time is enormously greater. Our vehicles will go fast enough, but there is little open road in city streets, and the hoped-for speed today is measured by what an automobile could do with free running.

Street railways must compete for business with frugal pedestrians and spendthrift automobile owners. A few can show a profit from the use of an automobile in city business, but only a few of the many who drive. In order to compete, the service rendered must be attractive from the standpoint of speed between the points where the customer starts to walk to a car line and where he wishes to go after his trip. The maximum speed does not worry him, although it may be of some interest in helping sell the comfort of the ride. The real point is the elimination of delays and, therefore, the saving that is made in time. Here is where the railway's greatest job comes in.

Many Sources of Delay

What delays are likely to happen to the customer on his trip? Let us list them:

1. Car arrives behind schedule time and keeps him waiting.
2. Cars on too long headway.
3. Car brakes slowly to rest.
4. Car stops in wrong place.
5. Doors on the car not open by the time the car stops.
6. Car slow in getting started due to slow conductor or motorman, to interlocking door and car control, to slow operating doors or slow release of brakes, to small platforms, to narrow doors, to slow fare collection system or slow transfer issuing.
7. Car accelerates slowly due to low voltage, small motors, heavy car, slow motorman.
8. Car held by traffic lights.
9. Car held by vehicles, street obstructions, street repairs, or other street abuse.
10. Car delayed en route by too much coasting.
11. Car delayed because brakes not quick enough to let car travel close to other traffic.
12. Car operating on too slow schedule speed.
13. Car delayed by too frequent stops.
14. Car slow in braking.
15. Car crew stops to buy lunch, to get a drink of water or get transfers or change.
16. Trolley pole comes off.
17. Crew has trouble throwing switch.
18. Car develops a defect.
19. Car must take curves slowly.
20. Car moves over special work slowly.
21. Car weaves, jerks or pounds low joints so as to make slow speed necessary.
22. Route of car indirect.
23. Street used for convenience of car operation rather than for convenience of passenger delivery.

That is a long list and yet probably not all the sources of delay. Some customers in certain cities honestly believe they meet each one of these delays on each trip. Are we as operators really alive to our jobs to cut down these constant delays and aggravations? I do not know your cities and your methods of operation, so I may freely challenge your attention to these common faults without a chance that you feel I am getting too personal. Can you sit down with this list and cheerfully check off each item and say it doesn't apply to you? If you give serious attention to each of these items will your speed be increased and would you sacrifice safety? If somewhere you did leave a little more opportunity for slight hazards, would that possible danger be large enough to worry over in view of the increased satisfaction to your customers? Could you afford to spend a dollar more per car per month in maintenance or repairs to collect one more fare for each trip, or a total of probably $35 per month? As a specific example, one property is actually losing customers and friends by its closed door operation in order to avoid trivial accidents that it can be proved cost less than $1.50 per car per month.

If each of the 23 items were changed to get faster operation would the highest speed be higher than the highest now used, or would it merely result in fewer delays, continuity of movement, a more uniform and steady progress that would be safer in the long run? Is it necessary to sacrifice safety to increase speed? Is low average speed improving safety or merely chasing away customers? It is impossible to discuss each of these in detail in the time available. I sincerely hope each operator will seriously discuss each of these with himself to see if he can approve of his present procedure.

In the item of brakes, electric cars are not modern. Many cars have a type of brake rigging with slack so maintained that it takes three seconds to get the brakes fully applied. In three seconds at 25 m.p.h. a car travels 112 ft. Then the car may travel 75 ft. more before it gets to rest. Yet we are competing with automobiles that can stop in 40 ft. when going 25 m.p.h. We must change our brake design, but before we can scrap the old we must improve what is worth improving during its life by getting such devices as auxiliary quick action valves, we must keep a better standard of rigging maintenance and higher brake pressures so the cars can

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stop really as they should. Railway practice must come closer to automobile practice.

Schedule speed is entirely too low on most properties. The crew loafs on its job when it should be alert to give snappy service that pleases by prompt, efficient activity. Haste isn't needed or wanted, but care to avoid delay—promptness to save movements. The operating speed is purely the result or lack of careful supervisory methods. First comes the building of the schedules, and this is not a simple job, particularly in the larger cities. The improved scheduling methods in Chicago as developed in the last few years have cut the costs $3,500,000 per year, as compared to what would have occurred had the old procedure been retained and the present standard of service rendered. Yet previously the Chicago system was as efficiently managed as in most cities. That is a direct measure of the importance of trained schedule makers and skilled analysis of the problem. Is sufficient specialized and competent attention being paid to the planning end of the business?

Speed Doesn't Increase Accidents

Cars in Chicago operate on the busiest streets, yet day in and day out the average street car speed between terminals is 11.2 m.p.h., and it is increasing. How many of the smaller cities have such average speeds in spite of their more open streets? Yet the accidents and the accident cost in Chicago are phenomenally low. High average speed can be attained with safety.

Many cars in this country are equipped with too small motors or else with two large motors, where there should be four smaller ones. A four-motor car can be operated faster and more dependably in bad weather than a two-motor car. Higher schedule speeds are difficult to make on slippery days when two-motor equipment is used. There has been too little careful investigation to determine the true economic picture when deciding on the purchase of equipment. It may not always be best to buy four-motor equipment, and some cars with four motors are not adequate to the job they are given. But I want to express a word of warning that the choice should be carefully planned by investigating the results to be accomplished. In Chicago we can give higher schedule speeds, more uniform speeds regardless of weather, can buy more expensive cars, but need a smaller number of them and hence less storage space, can use more electrical energy but less employees' pay hours and can operate to give better service, greater satisfaction and hence collect more fares while spending less total money in operating costs and interest, if we use appropriate four-motor cars instead of two-motor cars. Other situations may check out differently where wages are lower and charges for energy are higher, but the question needs careful search.

I will close by discussing traffic control briefly. This is more important in large cities, where the buildings are so much higher and relation between ground area for buildings and that for streets is substantially the same as in small towns. The only factor preventing hopeless congestion is that people are not all willing to insist on driving their personal automobiles on each trip. Some dislike the odor on busy streets, some prefer to read while they ride, some prefer to save the difference in cost, some know the difficulties of getting parking space, some can save time by using street cars, some know they have less nerve strain by traveling on street cars. The larger the city the larger the proportion of street users who ride electric cars or trains.

Even in smaller cities the control of street use is very important. To give the detail of it alone would take a long speech. I do want to say that it is such a highly important factor in the railway business today that each railway must be prepared to become thoroughly informed on the technique of traffic control. It is a specialized business calling for skill and knowledge. The ordinary man doesn't understand it, and most city codes and signal systems of today are seriously inadequate to provide the best usefulness of the streets or the least delay to movement. The railways serve the majority of those using the streets and should be competent to represent this majority in preparing the plans for traffic control. Even elected city officials cannot claim to represent a greater share of the citizens than can the railway management. If correct traffic control methods are developed all street users will benefit. There is under way now an active program to develop a model city code for traffic control. This is a committee of probably 50 members appointed by, and working under the direction of, Secretary Hoover. Such work will be a material help for those features, but in signal control or signal arrangement you should be very sure of finding trained engineering skill and experience to check up the installations. The great majority of signal installations today are failing badly to accomplish maximum traffic relief.

It is difficult in so short a time on so broad a subject to give actual specific plans or proposals that each man may take away to apply on his own job. I have not really attempted to do so. If I have aroused your interest and desire to give your work more intensive scrutiny to see if your methods are sound and defensible, I am sure I have not wholly wasted your time. It is absolutely impossible for any of us to be above criticism or beyond need of correction. Will you go back to your properties to search for ways of improving speed with the idea of gaining customers, increasing your net receipts and improving the usefulness of your service to the community? Will you also determine to give close attention to becoming a leader in the problem of moving traffic on the street? That means study, care and the obtaining of expert advice and others' experience. But as a railway operator you owe it to your patrons, who are the majority of the citizens and who have no better champion or representative than you, to protect their interests and provide a greater saving from time waste without undue sacrifice of safety. You also owe it to yourselves to grow into active leadership as the most competent authorities on matters of street traffic control.

Formula Omitted in Car Calculation Article

IN THE article by H. S. Williams, "When Is a Car Not a Car?" which appeared in last week's issue of the JOURNAL, one of the two formulas for calculating when a car should be retired from service, was omitted due to a printer's error. The formula which is the expression representing the annual cost of the old car is:

$$y = [(c - b) + (e - d)] f/g$$

in which y = Annual cost in dollars of the old car.
b = Maintenance cost per year of new car
c = Maintenance cost per year of old car.
d = Operating cost per year of new car.
e = Operating cost per year of old car.
f = Seating capacity of new car.
g = Seating capacity of old car.

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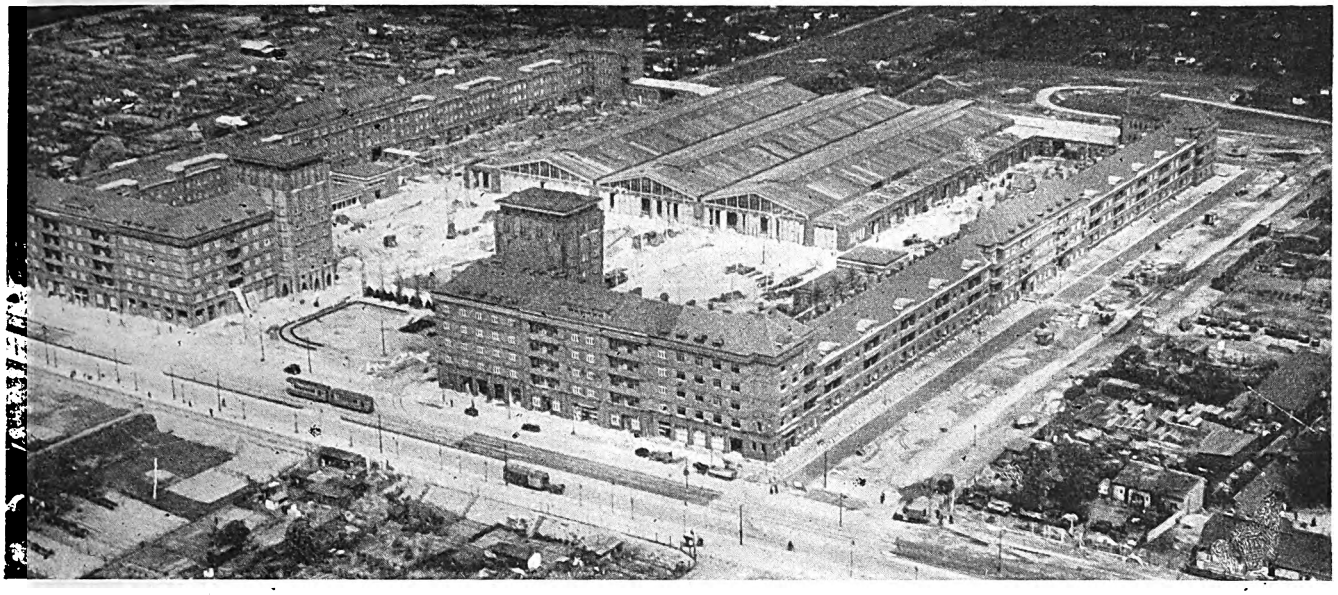

The Müllerstrasse apartment house for transportation employees is the latest development of this kind in Berlin. It supplies the men with comfortable and attractive housing close to their work

Labor Conditions

on European Local Transportation Systems

Extended psychological tests are conducted on applicants for employment and to some extent for older men. Great progress made in housing. Wages not so high as in United States

By Henry W. Blake
Senior Editor *Electric Railway Journal*

IN GENERAL, the methods of recruiting the transportation staffs on the large surface line and bus properties in Europe are more elaborate than in the United States.

An applicant for employment has to present the usual testimonials as to character and pass the standard physical and intelligence tests. But in addition a constantly larger number of companies are subjecting all of their prospective employees to a series of so-called psychological tests to determine their special adaptability to electric railway and bus service. Both physical and psychological tests are not confined to new men, but are often applied periodically to the men in service. Thus the practice of the S.T.C.R.P., the company operating the electric railway system in Paris, is to give a physical and psychotechnical examination, although not necessarily as extensive as to new men, to all motormen in the service every five years up until they reach the age of 45; then to repeat it every three years between the ages of 45 and 54, and then every year thereafter. Similar examinations are also often given to an enrolled employee after every accident in which he may have been involved as well as after every case of severe illness which he may have had. According to studies made by the Paris company in three successive years on both its railway and bus system, there is a tendency, after a motorman or bus driver reaches the age of 55 to 60 years, for his liability to accident to increase. The charts showing these records are reproduced. The company hopes by this frequent checking of the older men to overcome this trouble.

Psychotechnical Laboratories Common

Of the many laboratories conducted by electric railway companies in Europe to test applicants for employment psychologically as to the qualities especially required by motormen, probably those in Paris and Berlin are the most extensive.

Full particulars of the Paris system of psychological tests as employed in 1924 were published in the issue of this paper for Aug. 23, 1924. At that time the company reported that the records of 100 motormen who had been employed after the test had been established showed they had 16½ per cent fewer accidents than the same

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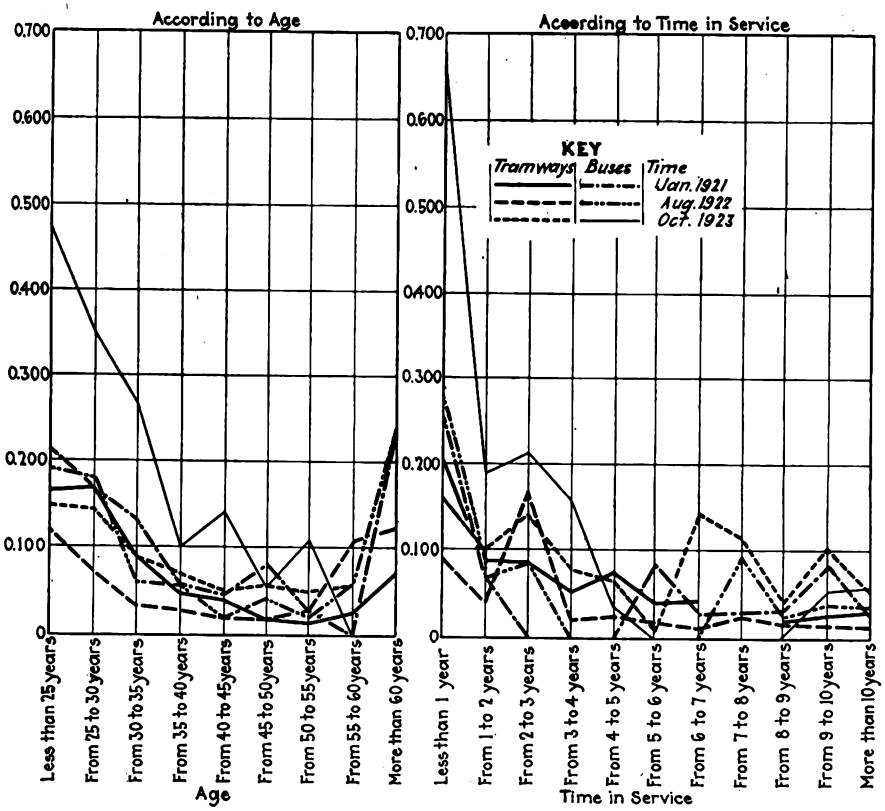


Monthly accidents per motorman and bus driver, according to age and length of service, Paris bus and surface line system

number of men who had been engaged before the tests were begun. This corresponded on the Paris system to an annual saving of approximately $52,000.

During 1926, with considerably more men in service who had passed these tests, there was a reduction in accidents over the preceding year on both the omnibus and railway systems, although the records of the police department show an increase in accidents among other vehicles using the streets. While all of this better showing by the railway and bus system cannot be attributed to the psychological tests, the management believes they have had a good deal to do with it.

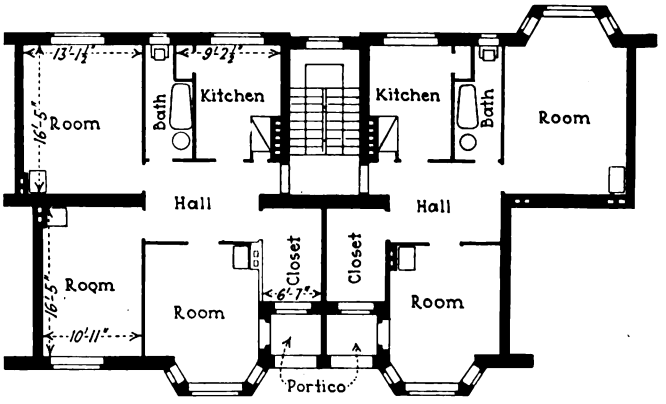
One change made in the Paris tests since the publication of the article in 1924 mentioned has been in the trial of judgment on speeds and distances. In this test the subject is shown various objects representing cars and other vehicles moving at different speeds on a skeletonized table and is obliged to indicate which of these objects he thinks will collide with any of the others. It was found that some men taking this test so instinctively understand the laws of the rates of speed that they can answer correctly, whereas others will wait until the objects come almost in contact. Now, this test is arranged so that certain of the moving objects pass behind a screen after they have been visible for what is thought to be sufficient time for the person under test to estimate their speed.

Another test now conducted not mentioned in the article is carried out with the help of a moving picture film. This film shows a crowded street in which pedestrians and various types of vehicles pass by and cross in front of the person under test. He views this picture while on a stand equipped with controller and brake handle to represent a car platform and mounted on springs so as to have a sort of rocking motion to make the resemblance more exact. While watching the picture he is expected to make the necessary movements with the controller and brake handle required in the conditions as they arise. When he applies the brake handle the picture also slows down. All movements by him of brake and controller are automatically recorded on a chart for comparative purposes. A similar platform, but equipped with steering wheel, service brake and emergency brake, has been arranged to provide a corresponding test for applicants for the position of bus driver with this company.

The satisfactory results obtained in the laboratory in testing prospective motormen and bus drivers has decided the company to employ similar, though of course not the same, methods for testing candidates for conductors and apprenticeship courses at its repair shop. These tests have been begun, but the results from them are too recent yet to give any definite information.

The Berlin psychological tests were also the subject of an extended article which appeared in the issue of the JOURNAL for Jan. 28, 1922. Since that time they also have been modified somewhat, principally in the direction of simplification, except in the hearing test, which has been somewhat amplified. At present the applicant for employment has not only to pass a test to determine whether he can hear sounds of various volumes, but also a directional hearing test. In this, sounds come from one and then another sound box set in different parts of the room and the applicant has to identify the direction from which the sound comes. The psychological tests in Berlin last a whole hour and are given not only to new men but to any motormen in service who may be sent to the examination room by the chief instructor. This is usually done with any man who has had an accident. The Berlin company finds that from 20 to 30 per cent of the men who pass the physical tests preliminary to engagement fail in these psychological examinations and believes their continuance reduces accidents.

The European schoolrooms for motormen, bus drivers and conductors have the usual models for illustrating the working of the apparatus. In the rooms for student motormen there is often a truck with complete electrical equipment and car flooring partly cut away to show the



Plans for typical "two-room" and "three-room" apartments in combined car and apartment house in Berlin

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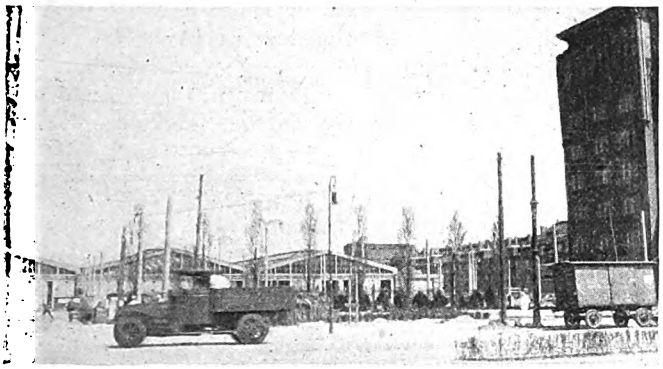
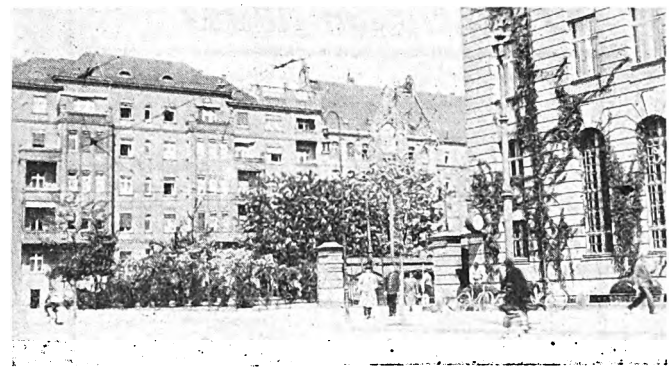
Housing Accommodations for Employees in Berlin

The Berlin Surface Lines has erected housing accommodations for employees and their families adjoining eight of its carhouses. These are various views of the Müllerstrasse carhouse, the latest building of this kind, where there are accommodations for 247 families.





attachment of motors to axles, etc., and a large chart of the various electrical connections, outlined with lamps which light when the controller on the truck used for demonstration purposes is turned. In the rooms for student bus operators there is a corresponding set of equipment.

Views are shown of two models used in the bus instruction room at Hamburg. One illustrates the full-sized bus chassis used. In this chassis the engine can be revolved slowly by means of an electric motor. The sides of the hood are glazed with transparent celluloid so that the movement of all parts can be seen with the hood down, and the casings of the gear shift and differential are partly cut away to expose the construction of those parts. The adjoining view shows a wooden model used in the schoolroom to explain the operation of the internal combustion engine. An account of the method used in the electric railway instruction room to explain the operation of an electric car controller was published on page 234 of the issue of the JOURNAL for Aug. 6.

Probably the most extensive school for bus drivers is that of the London General Omnibus Company, which operates 4,000 buses. To insure thorough training under service conditions the company has constructed adjoining its shops at Chiswick a series of test roads embracing acclivities, declivities, hidden turns, broad thoroughfares, narrow winding lanes, congested crossings, greased roads with obstacles to avoid and grades coated with grease. These tests are followed by still a second series given under the direction of Scotland Yard, because a police certificate is necessary before a driver can assume charge of a bus in London.

After a man has been accepted for employment and trained, the next important matter on a European railway property is believed to be to make his working conditions such that he can perform his duties in the best possible manner. This means, of course, comfortable employees' rooms, sick and death benefit funds, pensions and other practices with which American operators are familiar. The European properties have all these too, but in addition on nearly all properties there are arrangements by which at least some of the employees may live close to their place of work. This not only cuts down the time required by them to travel between their homes and place of employment, but is of value to the company as it makes them more easily available in cases of emergency.

The most common form of providing for this condition is to build with each carhouse two or three regular family apartments which are generally near the entrance and on the second or third floor of the carhouse. One of these apartments is occupied by the superintendent of the carhouse or division and his family. If there are other apartments, they are occupied by the superintendent's assistants and their families, one usually by the transportation assistant and the other by the mechanical assistant. This practice is so common in continental Europe that it may almost be called universal. Occasionally, the general manager will be found occupying a house directly adjoining the main depot and repair shop, as in Dortmund.

To carry this plan still further, some properties have undertaken housing developments for their transportation employees adjoining the carhouses from which the men operate. One apartment house of this kind, erected by the Lombard Electric Traction Company of Milan, Italy, was illustrated in the issue of this paper for July 30, 1927.

The most extensive undertaking of this kind, however, is undoubtedly that of the Berlin Surface Lines. This company has erected apartment buildings adjoining eight of its carhouses, the buildings having from 58 to 247 sets of apartments each. The largest of these employee

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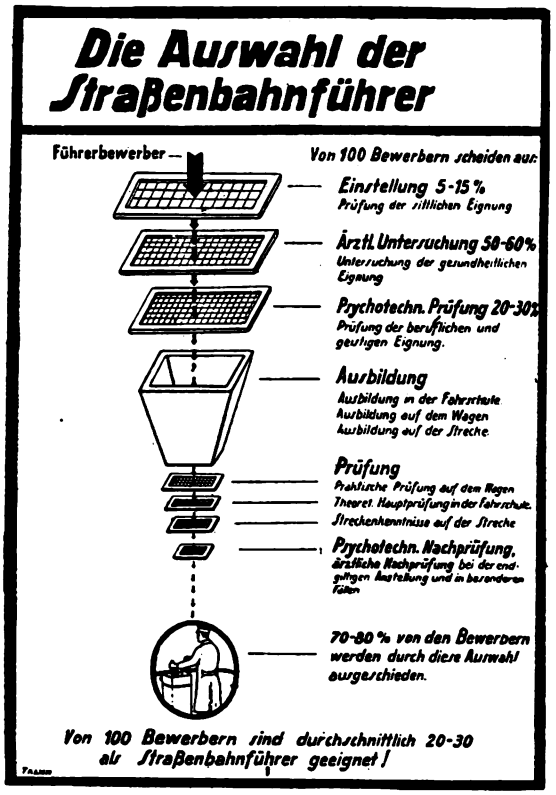
apartment houses is one completed during the last six months adjoining a 300-car capacity carhouse on Müllerstrasse. This structure occupies an entire block with the carhouse in the middle of one side, and it contains ten single-room apartments, 165 two-room apartments and 72 three-room apartments. In this classification only living rooms are counted, i.e., not the kitchen, bath or hall. Thus, a "two-room" apartment would have besides these three rooms two good-sized rooms suitable for general purposes in the daytime and for sleeping at night. The sizes of these rooms in the two-room apartment illustrated are 16 ft. 3 in. x 13 ft. 6 in. and 12 ft. 2 in. x 12 ft. 6 in. In addition nearly every apartment has a balcony. All the way in front of the apartment building toward the center is space for flower beds. Half of



Poster used by Berlin Surface Lines to show that of 100 applicants for the position of motorman only from 20 to 30 finally qualify

the cost of these buildings was furnished by the Berlin Street Railway, which is owned by the city. The other half of the cost was furnished at low interest terms by another department of the city government, known as the Wohnungsfürsorge Gesellschaft.

These apartments are rented to employees at a rate which is considerably less than would have to be paid for corresponding accommodations in an outside apartment house. There is also the understanding that they are primarily for employees of the company, and while a tenant is not obliged to vacate if he ceases to remain in the employ of the company, his lease provides that he shall then pay a higher rental. The aggregate rentals are based on providing a sinking fund of 1 per cent a year on the cost of the buildings after paying maintenance and interest on the investment.

In connection with these housing projects, it should be said that the rate of labor turnover in the European tramway systems, at least those on the Continent, is less than that on many American roads. Men who accept employment seem to do so with the idea of remaining indefinitely in the service. This condition, obviously, simplifies the question of the erection of housing accommodations.

Wages

The wages of transportation employees in Europe, as one would expect, are considerably lower than those in the United States, but the same is also true of all payments for personal service, and applies to the salaried officials of the companies as well as to the wage earners. As in the United States, also, the rates vary with the locality and presumably the cost of living also varies in very much the same ratio.

The basic wages paid to motormen, drivers and conductors on the Paris trolley and bus lines are given in Table I.

TABLE I—BASIC YEARLY WAGES OF CONDUCTORS AND MOTORMEN, PARIS SURFACE LINES

	Francs	
Begin at	737	$303
End of first year	767	307
End of next 1½ years	787	315
End of next three years	807	323
End of next three years	827	331
End of next three years	857	343
End of next three years	887	355

In other words, a motorman or conductor on the Paris Surface Lines does not begin to receive his maximum pay of $355 a year until he has worked with the company 14½ years. The hours are 48 per week and each employee receives two uniforms a year with hat and coat. He also receives certain bonuses, including an allowance based on the size of his family, a division among all employees of 4 per cent of the gross receipts of the company, payments made by it into the employees' sick benefit, pension and other funds, etc. These additional receipts of the employees in some recent years have been equivalent to a considerable percentage in addition to the amounts actually received by them as wages.

The practice of making extra allowances to employees, based on the size of their families, is common in France, indeed to some extent throughout continental Europe. Thus, the Metropolitain Company, which operates the principal rapid transit system in Paris, has a monthly wage rate of from $32.80 to $39 for the conductors on its trains and from $30.60 to $33.20 for its train guards. But various bonuses can raise these wages 36 cents a day for the guard to 40 cents a day for the conductor, while the monthly allowance for children per employee varies from $2.40 to $4.68 per child, depending on the number in the family.

On the Berlin Surface Lines the wage schedule for

TABLE II—AVERAGE HOURLY WAGES (IN PFENNIGS PER HOUR) PAID TO EMPLOYEES IN MAXIMUM TIME GROUP AND INCLUDING ALLOWANCE FOR SIZE OF FAMILIES, BERLIN SURFACE LINES, ALSO REICHSINDEX OR COST OF LIVING FIGURE

	1924				1925				1926			
Quarters	I	II	III	IV	I	II	III	IV	I	II	III	IV
Skilled workmen	53	66	70	76	81	88	88	93	93	93	93	98
Motormen	48	61	66	76	81	86	86	91	91	91	91	96
Conductors	48	57	61	66	71	76	76	81	81	81	81	86
Unskilled labor	43	52	54	59	64	68	68	71	71	71	71	74
Reichsindex	116.6	122.3	126.0	132.6	136.0	138.3	144.9	141.2	138.3	140.5	142.0	144.3

Note—10 pfennigs=2.4 cents.

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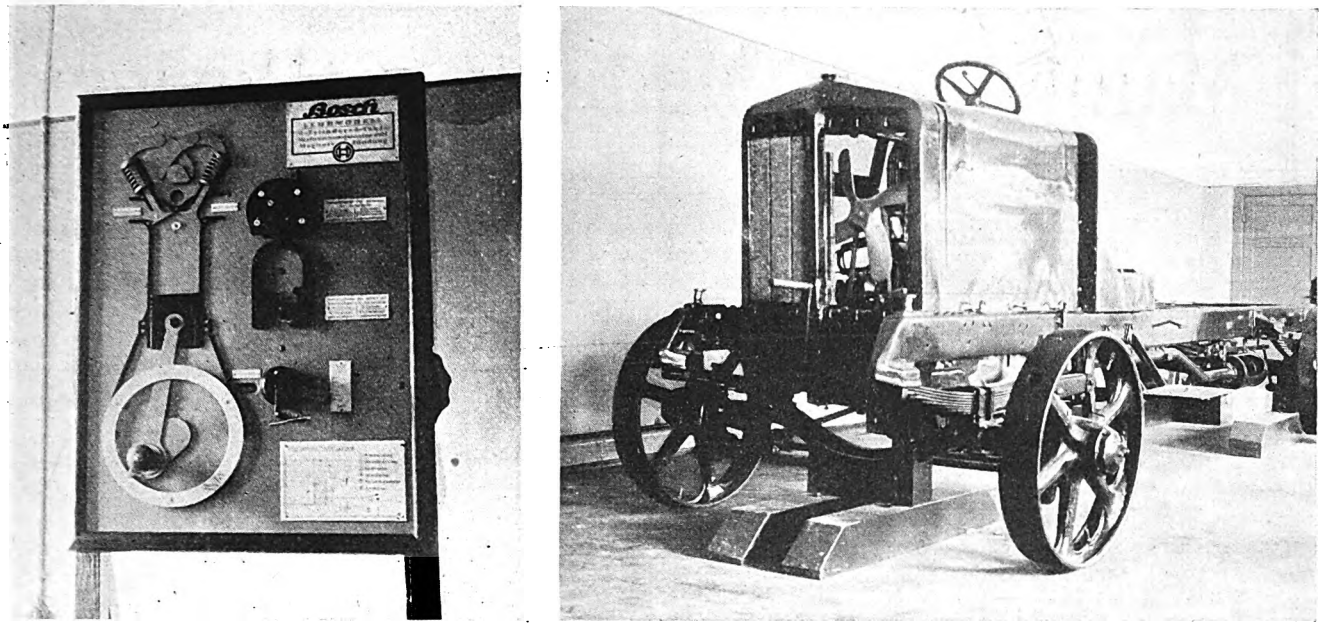


The Hamburg Surface Lines has simplified models of bus and electric railway equipment in its student training rooms

motormen and conductors prior to Oct. 1, 1924, called for the maximum rate of pay after six months service. On Oct. 1, 1924, this period was increased to one year. On Nov. 1, 1925, it was increased to two years, and on Oct. 1, 1926, it was again increased, this time to five years. Besides their rates of pay, married employees receive a further allowance, according to the size of their families.

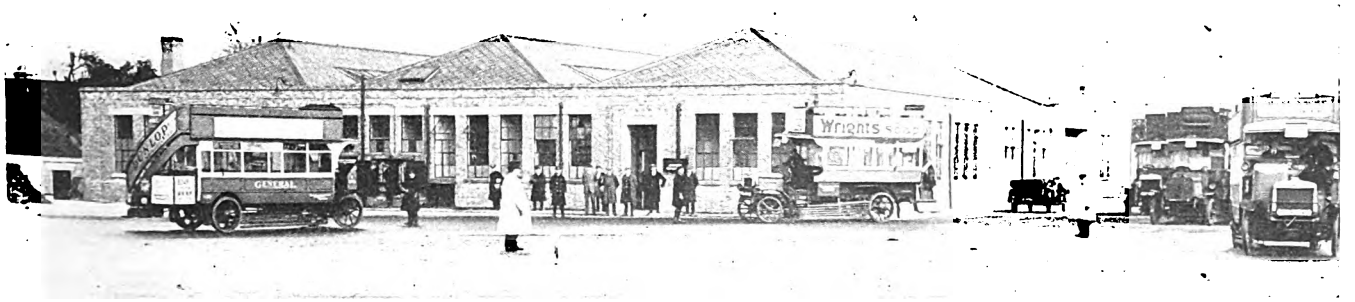
Table II shows the average rate of pay of those employees in the different groups receiving the maximum rate. It is given in pfennigs per hour (10 pfennigs = 2.4 cents). As will be seen, there has been a continuous increase in all departments during the past three years. There has also been an increase in the cost of living in Berlin, as shown by the Reichsindex, which is also given in the table, but wages have increased more rapidly than this index figure. The wages paid to conductors in 1914 before the war (the time at which the Reichsindex was 100) was as follows: After the first year of service 40 pfennigs an hour, after the second year 42 pfennigs and after the fifth year 44 pfennigs. Compared with this maximum rate figure before the war, the wages of the average maximum rate conductor now are 95.4 per cent higher, although the cost of living in Berlin has gone up during the same period only 44.3. In December, 1926, the Berlin Surface lines had 3,327 motormen and 5,401 conductors. The greater number of conductors is due to the large amount of trailer operation on the system.

A table showing the wages paid on the Rome (Italy) tramways was published on page 950 of the issue of this paper for May 28, last.

In London the wages are somewhat higher on both bus and tram lines than in the continental cities mentioned. The wages paid by the London General Omnibus Company at present for driver is 20⅜ pence (40¾ cents) an hour during the first six months and 21⅞ pence (43¾ cents) an hour thereafter. The rate for conductors is 18⅝ pence (37¼ cents) an hour during the first six months and 20⅛ pence (40¼ cents) an hour thereafter. The company has an agreement with its men, however, that if the government cost of living index should fall to 75 or less, these hourly rates would be reduced by a farthing (½ cent).

A further explanation should be made, also, that the rates for overtime and special wage rates on this London transportation system are quite liberal. Thus, on all services at night, on Sunday and Good Friday, and for all time worked by a man voluntarily on an appointed rest day, the company pays time and a quarter. It pays time and a half on public holidays and it pays double time on Christmas Day. It also pays time and a quarter for the first two hours worked in excess of the 48-hour week and time and a half thereafter.

In the way of uniforms and clothing, the company agrees besides wages to give to every conductor a cap every year and three suits of uniforms every two years. The arrangement with the driver is that he gets a cap and two summer linen coats every year and a heavy winter coat every two years. Every driver and conductor also is entitled to an eight-day holiday with pay during the year provided he has completed twelve months service with the company.



London bus drivers have to pass non-skidding tests on greased pavement. This testing field adjoins the company's shops at Chiswick in the suburbs of London

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Maintenance Methods *and* Devices

Testing Axles in London by the Magnetic Method

MINUTE cracks in car axles of the London County Council Tramways, London, England, which would not be found by ordinary observation, even with the aid of a magnifying glass, are being located in the overhaul shops by an ingenious method. The principle is first to magnetize the axle by means of an electro-magnet, then to pour over the axles kerosene in which iron filings are held in suspension. If the axle is intact, the kerosene and iron filings will run off. If, however, there is a small crack in the axle there will be a local north and south pole at that point and some of the iron filings will remain on each side of the crack. It is necessary then only to look over the axle to find the location of the defect.

The first illustration shows the form of axle tester of this type used in the shops of the London County Council Tramways. It consists of a horseshoe magnet with concave terminals so as to fit a 5-in. diameter axle. Where the axle is smaller than this diameter a small make-up piece of steel is used, as shown in the illustration. A container holding kerosene and iron filings may be seen directly in the rear of the axle and a pail to receive the mixture after it has been poured is underneath.

The apparatus used for the same purpose in the repair shop of the London Underground Electric Railway Company, Ltd., is of somewhat different design in that the vertical end supports for the axle are part of the magnetic system. The axle is brought by a crane and set in the machine shown in the illustration. The magnetic core is underneath and the pail to receive the solution as it is poured on the axle is in a tray between the two vertical supports.

While the method has proved very satisfactory, it has been found necessary to demagnetize the iron filings after they have been used for this purpose for some time. This is accomplished by a coil of wire wound around the container through which alternating current is allowed to pass. To keep moisture out of the solution, a small amount of calcium chloride is added to it.

Incidentally, this same process, which was devised by W. E. Ireland, rolling stock engineer London County Council Tramways, is also used in England for testing turbine blades and for other industrial purposes.

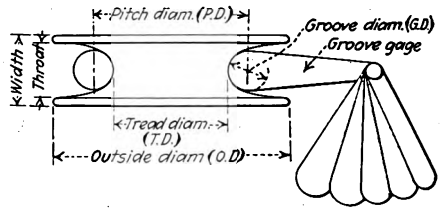
Groove Gage for Sheave Treads

By WALTER VOIGTLANDER

Rope Engineer American Cable Company, Chicago, Ill.

PERHAPS no single element can be more detrimental to wire rope than an improperly fitted sheave. One that pinches will do more damage to a wire rope in an hour than a properly grooved sheave could in an entire week. One with too soft a tread will increase abrasion and the grinding action to an extent that will cause premature breaking of the outer wires and loss of rope strength.

Engineers and operators sometimes forget that by the time it becomes necessary to install a new rope the old sheave will have become worn to such an extent that it will cause serious loss to the service of new rope. When installing a new rope it is economy to gage both the rope and the grooves of all sheaves and drums. If the groove diameter of any sheave is less than the actual calipered rope diameter decreased service will result.

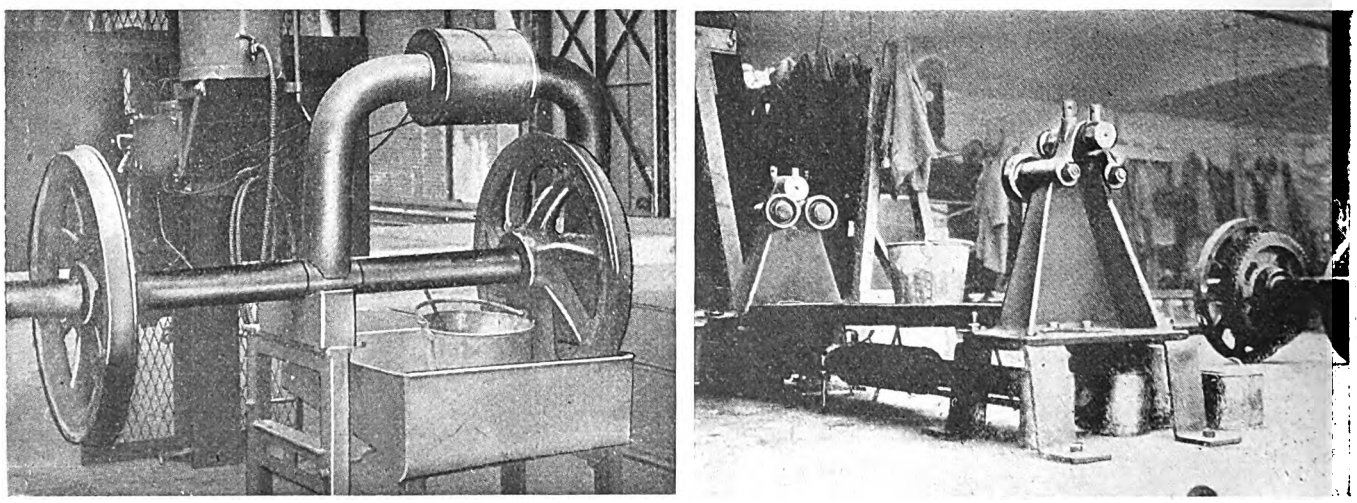


Method of calipering sheaves to insure proper groove diameter

One of the simplest and most accurate methods of gaging sheave treads is by the use of a groove gage as indicated by the accompanying illustration. The following tolerances should be adhered to:

Diameter of Rope	Tolerance of Groove Diameters Minimum, Inches	Maximum, Inches
½ in. and smaller	+1-32 to	+3-32
9-16 in.-1 in.	+1-16 to	+1-8
1-16 in.-2 in	+3-32 to	+3-16
Over 2 in.	+1-8 to	+1-4

At the time that attention is given sheaves it is well also to check up on alignment as considerable wear to both rope and sheaves may result.



London companies test axles by the electro-magnetic system

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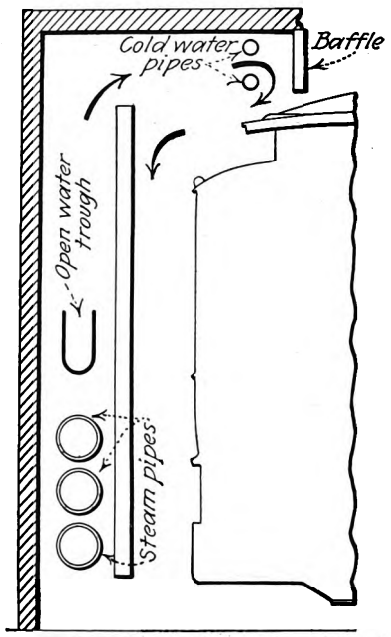
Particularly in high-speed work it is necessary to maintain proper alignment of all equipment and to balance all sheaves.

Dortmund Uses Drying Room for Painted Cars

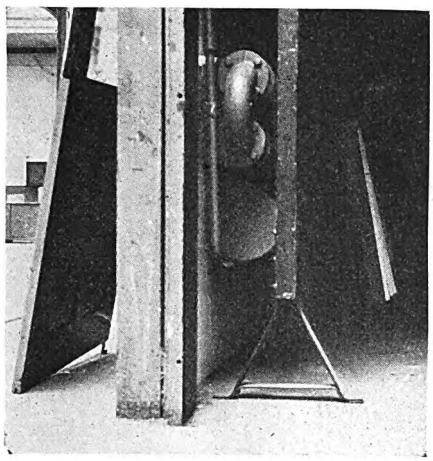
DRYING of freshly painted cars is expedited in the paint shop of the Dortmund Street Railway, Dortmund, Germany, through the use of a special drying room. While a freshly painted car is drying in this room,



Approximate section of side wall and partition in drying chamber

the temperature is kept continuously at 35 deg. R. (112 deg. F.) and at 70 per cent humidity. There is also a constant circulation of air.

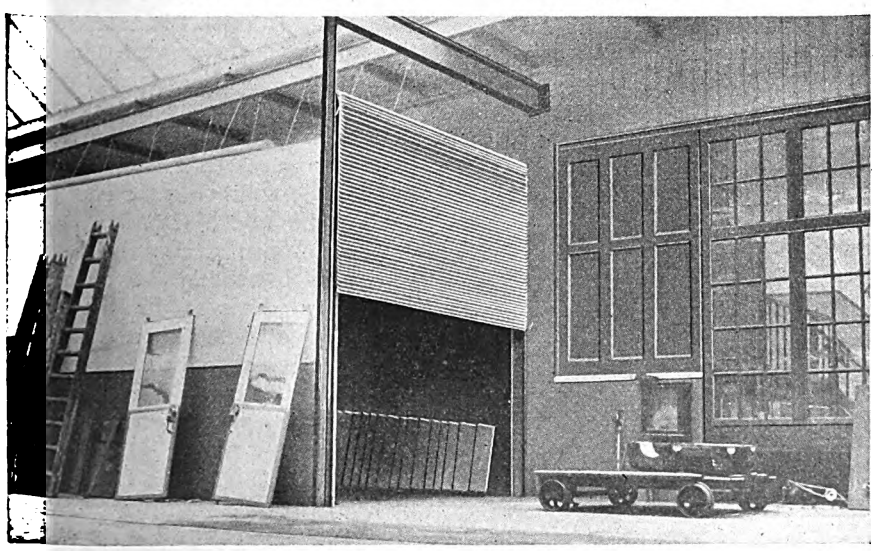
The requisite heat and humidity in the room are obtained through steam pipes and water pans on each side of



Interior of one side of drying chamber

the drying room, but the direct heat from these pipes and pans on the side of the car is cut off by a partition, open at the bottom and top, between them and the sides of the car. The general construction of one side of the room is shown in one of the accompanying illustrations. Briefly, there are on each side, in the open chamber shown, three rows of steam pipes with one open trough for water above them. The heat from these pipes draws air from the lower part of the room up between the side wall and the partition. After passing over the steam pipes, this air circulates around an open trough of water, then passes over the top of the partition toward the center of the ceiling. Over the nearer side of the car it strikes two pipes of cold water and a baffle, which caues it to flow down over the side of the car. It is then exhausted out of the room. The time required to dry a car in this room is about four hours as compared with twelve hours outside.

Incidentally, all of the cars on the Dortmund system are painted white for city service so that they present a very handsome appearance. The motor cars have monitor roofs and the trail cars arch roofs. The ceiling of the cars is white and is of composition board 5 or 6 mm. (0.2 in.) thick. The interurban cars are very similar in coloring.



Exterior of drying chamber, Dortmund. There is a constant regulation of air of the proper temperature and humidity

Car Color Change Provides Greater Attractiveness

By Robert Harris
Master Mechanic New Brunswick Power Company, St. John, N. B.

A VERY intensified rehabilitation program is being carried out on cars of the New Brunswick Power Company, St. John, N. B. As a part of this the selection of color has proved a very important factor. Consideration has been given to high visibility and to providing a more attractive appearance. The exterior color scheme consists of Persian scarlet enameled body and letterboard, and Pullman cream trim for window sills, grip rails and perpendicular posts. Sash on doors are cherry red enamel. A slate color is used on the roof and this paint is a canvas preservative type. Trucks and miscellaneous fittings such as headlights, trolley catchers, bases and poles are black. All window guards, panels, etc., are aluminum.

On the interior of the cars all trim and sash are of light cherry stain varnished. Seats are oiled and varnished on natural wood. Headlinings are of Pullman cream enamel, paneled. Pipe stanchions, hand rails, etc., are finished in aluminum. The floor is painted a pearl gray.

The cost of painting varies greatly with the different styles and size of cars in service on our system and also to the volume of work done and method of application. The cost for painting a car 31 ft. long has averaged about $68. This includes cleaning, varnishing interior with one coat of enamel on the headlining, one coat of enamel on the exterior, where the color scheme has not been changed, and one coat of surfacer on the main body. Two coats of enamel are applied to the letterboard, where the color scheme has been changed. This has been found necessary due to the change from the dark green to bright red. Letters and numbers are of imitation gold paint. No striping is used. Detail costs are, for material, $25.38; labor, 76 man-hours, $36.96; taking out sash and replacing. $6.

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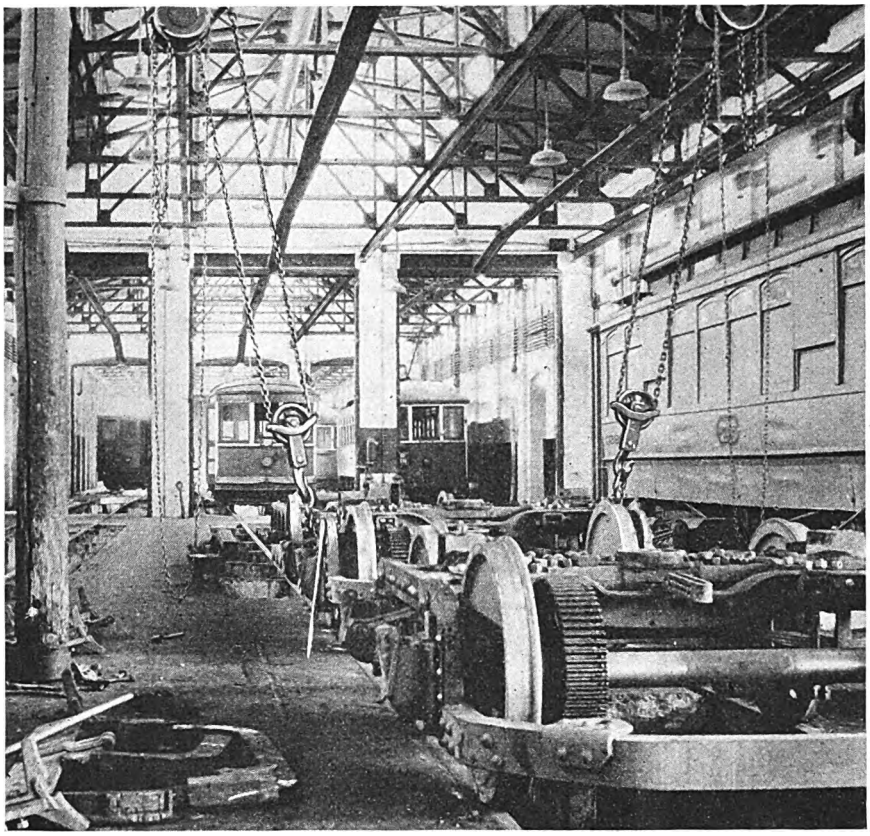
Double Hoist Lifts Truck Frame Evenly



Hoists on both sides of the overhaul track raise truck frames evenly in the Waterbury shops of the Connecticut Company

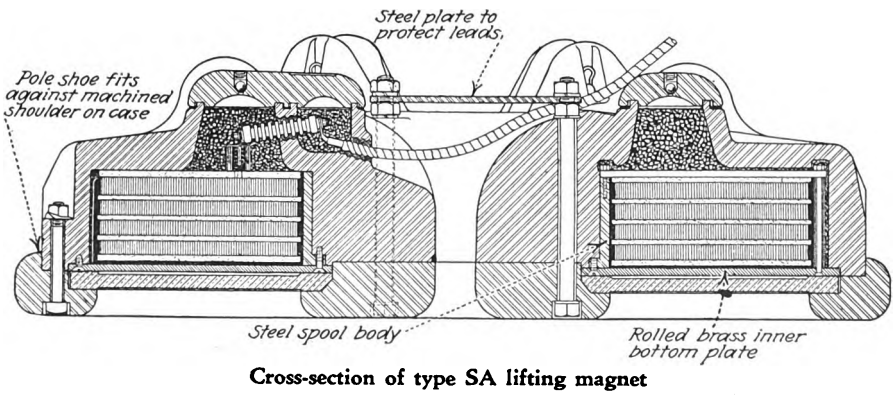
DOUBLE chain hoists are provided for raising truck frames in the overhaul shops of the Connecticut Company at Waterbury. Each hoist is of 5-ton capacity and is suspended by rollers from the roof girders. To raise a truck frame one hoist is fastened by chains to each side of the truck frame. The two hoists are operated at the same time with a man at each. Operation of the hoists thus serves to lift the frame evenly. This practice has been found to be more convenient than the former practice of raising one end of the truck frame by means of a single chain hoist. Accurate lifting is also of advantage to prevent binding at the pedestal jaws and journal boxes.

New Equipment Available

High-Strength Lifting Magnet

LIFTING magnets of an improved type are now in production by the Electric Controller & Manufacturing Company, Cleveland, Ohio. The new type has a coil spider of composite construction with the body of cast steel and flange of cold rolled brass. Great strength and increased lifting capacity are the advantages claimed as compared with the one-piece cast-brass spider previously used.

The outer pole shoe is extended upward to fit against a machined surface on the outside of the magnet housing. This gives increased strength to prevent pole shoe breakage. A steel plate ½ in. thick is bolted in place at the top of the magnet to prevent injury to the incoming lead wires from the crushing effect of the crane hook and chains.

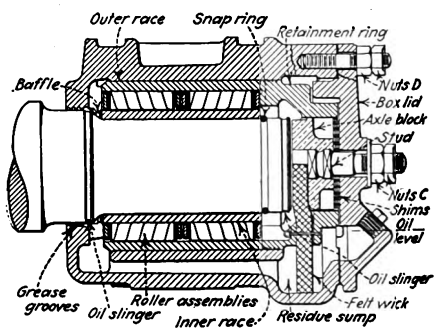


Cross-section of type SA lifting magnet

Cheap waste for bearing lubrication is a cheap way to waste your company's money.

Improved Roller Bearings for Railway Service

ROLLER bearing service on railroads has given experience, as a result of which the design of the railroad journal box furnished by the Hyatt Roller Bearing Company, Harrison, N. J., has been modified. In the improved design oil leakage is obviated through the use of a system of grease grooves which are just back of a baffle wall. These catch the oil passing through the bearings and divert it to an annular groove,



Improved type of railway roller bearing

which carries it back to the oil reservoir at the bottom of the box.

Various methods of closing the box at the front have been tried. In the improved design the box lid is separate from the spacer casting which holds the axle block in place. A spacer casting separate from the box lid assures that the lateral play of the axle will bring the end square against the axle block.

In the original design the axle block was held insecurely by offset bolts and locking devices. In the improved design it is a floating element held securely against rotation by its square section and laterally by locking.

Shims interposed between the axle block and the cover lid permit precise adjustment of the lateral movement of the axle. Adjustment of the blocks to compensate for wear should be necessary only at shoping periods of cars for heavy repairs.

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Association Activities

Speed with Safety the Topic at Wisconsin Association Meeting

Possibilities of bending every effort toward increasing the speed of car and bus operation without sacrifice of safety occupies attention of the Transportation Section

THAT the spirit of the new day in the electric railway industry has permeated into the rank and file of the actual operating men was eloquently symbolized at the annual convention of the Transportation Section of the Wisconsin Utilities Association in Milwaukee, Aug. 18 and 19. This section, which was the first state organization to abandon the name "Electric Railway" and substitute therefor the more significant term "Transportation," lived up to and exemplified in its convention the modern conception of the industry's obligation to its stockholders and its patrons.

The broad, dominating theme which ran through the convention papers and discussions in many forms and variations was greater speed with safety for all kinds of traffic in the interest of motorists, pedestrians, transportation patrons and companies. Of the 88 delegates registered, about 67 represented transportation companies and the others manufacturing and supply institutions. Attendance at sessions, however, ran as high as 150 persons.

The consensus of opinion was that electric railway managements should become authorities on traffic control and regulations in their local communities. Encouragement of cross-breeding, as Henry Cordell termed it, between street cars and buses, so as to glean the best features in each, was declared to be the need of the hour.

A resolution was adopted calling for the appointment of a committee to work out a plan which will enlist the active co-operation of all citizens in reducing the increasing number of all forms of street accidents. A strong sentiment prevailed that automotive-dealer and motorist associations were neglecting public safety considerations and that consequently it would be a timely good-will promoting activity if the organized transportation companies took the lead in building up a militant public opinion against all form of recklessness on streets.

Service Must Be Paid For

W. H. Sawyer, president of the A.E.R.A., who was the banquet speaker, climaxed the outspoken character of the meetings by stating emphatically that progressive transportation companies have done more than their share in expending money to provide improved facilities at big sacrifices in earnings and that now it was time squarely to ask street car riders to pay a fare that will be adequate to meet the costs of better trolley service.

He advocated asking the public for a 10-cent cash fare with a lower ticket rate at some figure that will produce a profitable return. He asserted that communities must be asked to assist car riders with such definite legislative measures as preferred right-of-way for trolleys, elimination of free riders and unjust paving charges and eradication of exorbitant tax collection through car fares.

"Transportation management cannot much longer keep up street railway organizations that do not earn a reasonable return," said Mr. Sawyer. "The issue must be faced. In most cases it is the fault of the managements themselves that car riders do not understand they are being discriminated against in so many ways, and, with traffic conditions getting worse, this discrimination is being aggravated. It must also not be forgotten that our industry is a business of increasing unit costs. Companies should present the facts of the situation to the public through consistent advertising and by any other means at their command, because public transportation is a vital necessity. It must and will go forward. If we do not do the job right, somebody else surely will."

J. H. Lucas, general superintendent of rolling stock of the Milwaukee Electric Railway & Light Company, was unanimously elected chairman of the section, succeeding C. L. Hedges. Henry Cordell, master mechanic, Chicago, North Shore & Milwaukee Railroad, was elected vice-chairman.

Knowledge Gained at Conventions Should Be Used

In his opening address, Chairman Clyde L. Hedges, La Crosse, stressed particularly that the person who fails to take advantage of the knowledge and experience which can be gained at the convention is not only derelict in his duty toward his company but also toward the public. He called attention to the change in attitude reflected in the change of name of the association. The change was made to reflect and symbolize the broadening of the field. Utility operators, as transportation men, through long experience are best equipped to supply public transportation in any form, whether it be by street railway, bus, taxi or airplane. Mr. Hedges also made reference to the passage by the Wisconsin Legislature of the bill to place bus companies under the jurisdiction of the Wisconsin Railroad Commission, calling it one of the greatest milestones of progress in the orderly development of the bus business. As a result of the bus law the public will be assured more dependable, safer, better co-ordinated and more uniform bus service. Wildcat competition will be eliminated, but the bus company that is willing to serve the public will be assisted.

Safety work, Mr. Hedges pointed out, should be directed to the benefit of the 70 to 80 per cent of the people who use the street cars. Patrons of public transportation systems, instead of being rewarded for making the most economic use of street space, are being penalized by most of the traffic regulations that have been established. Everything possible is being done to permit speedier motion of the private automobile, but practically nothing is being done to give the street car the opportunity to speed up schedules. He urged transportation men to take the lead in arousing a strong, active and militant public spirit against recklessness and carelessness on the highways. In conclusion he recommended the appointment of a committee to consider and work out a comprehensive state-wide plan to make streets safer for every person. Such a committee should consider:

1. The advisability of organizing citizens' safety committees in each city.
2. Advisability of having these committees work for the passage of a law which will make it compulsory for a person to prove that he is capable of driving an automobile.
3. Advisability of a law to compel the automobile owner to carry liability insurance.
4. Advisability of a law calling for dead stops for motorists on the principal street railway lines as well as at railroad crossings.

Papers on "Speed with Safety" from different viewpoints were presented by E. J. McIlraith, staff engineer Chicago Surface Lines, and Thomas R. Tate of the Milwaukee Traffic Survey. These are abstracted elsewhere.

C. M. Larson, chief engineer Wisconsin Railroad Commission, defined the conditions of safety that must be provided. A workable definition of the phrase "safe service," he said, would probably be about as follows: Service that is safe if the patron, the operator and all others concerned exercise rea-

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sonable care. If everybody would exercise such care at all times there would be few accidents. It is, however, becoming more and more customary for the public to look on the operators of public conveyances for protection, even against their own unreasonable acts. The attempt is made to hold the carrier responsible, though the occurrence of an accident involving a bus or a street car is by no means evidence of unsafe practices on the part of the operators. Usually, however, somebody has violated some rule of safe practice.

There must be a reasonable balancing of safety and service, said Mr. Larson, and the best thought of the management must be enlisted to work out the proper proportion of each element. We have taken the lead, according to Mr. Larson, in the promotion of safety, and whether we will or no, the public looks to us to carry on. In a sense we have undertaken a service, that of safety, and our example as well as our precepts should be designed as a guide to those who do not yet see the need of everlasting care and caution when in contact with their fellow men.

R. M. Howard, vice-president Mississippi Valley Public Service Company, Winona, Minn., reported on accident experience of the Wisconsin electric railways. He showed that with but a small increase in car-miles operated from 1918 to 1926, inclusive, transportation accidents have increased slightly, while automobile collisions have more than doubled. In the same period the motor vehicle registration has increased from 196,844 to 662,282, or 3.3. times. He pointed out that local governing bodies need the wholehearted support of the general public in all matters pertaining to traffic rules and public safety before any substantial improvement can be effected along the lines of accident reduction. How to secure that support is a problem for the future.

Designing and Operating Cars and Buses for Greater Safety

A considerable portion of the Friday morning session was given to a discussion of increasing co-ordination of car and bus for greater speed with safety. Papers on design were presented by J. H. Lucas, Milwaukee, and J. R. Blackhall, Joliet, Ill. The former will appear in a future issue.

Mr. Blackhall told of the worm drive car which is under construction by his company. The trucks have already been described in this paper. The body will be of aluminum alloys, reducing the total weight to 21,200 lb. for a car 41 ft. 2½ in. over all, or 424 lb. per seat as compared with 900 lb. for the present type. The trucks, now being tested under a standard car body, have run some 10,000 miles without failure of any kind. Wheel wear, is partially eliminated by the differential axles. Variations of wheel diameter make no difference, nosing is eliminated and flange wear is materially reduced. Elimination of nosing has reduced oscillation of the car body, and any slight tendency to oscillate is overcome by the fixed bolster.

Judging from the first 10,000 miles the speaker said that approximately nine times more mileage may be expected from the brake shoes, which are of the automobile type. No adjustments have been made, whereas the ordinary brake shoes must be adjusted about once a week. It is estimated that a total of 400,000 miles may be obtained from each brake drum of the new truck, and that the wheels will last for 150,000 miles, as compared with 50,000 miles with brake shoes rubbing on the treads.

The accelerating characteristics of the new car were 25 per cent better than for a similar car with maximum traction trucks. The coasting was improved 10.5 per cent and the braking rate was 11 per cent higher. The free running speed with the temporary body was 12 per cent higher, and with the new aluminum body it will probably be 30 to 40 per cent higher than for the ordinary car and trucks.

Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad, pointed out the lessons taught by modern transportation vehicles. The public, he said, is no longer content with slat seats nor even moderately comfortable upholstering. What is wanted today is speed, power, short and smooth stops and long life. Roller bearings should help reduce friction and should also help the lubrication problem. Differential axles should reduce energy consumption, decrease noise, lengthen the life of wheels, reduce track wear and carhouse labor. Master mechanics, however, do not appreciate the fine adjustment that is required to obtain maximum life of such power transmission units, so that a campaign of education may be needed. Automobile type brakes decrease noise and may be advantageous, although the speaker was not ready to give an opinion on this point.

The remarks of F. M. Holaday on co-ordinating rail and bus lines for greater safety and increased operating efficiency are published elsewhere.

Three papers were presented on the subject of maintenance of way. These were by F. J. Kramer of the North Short Line, E. J. Archambault of Milwaukee and A. A. Oldfield, engineer maintenance of way Wisconsin Power & Light Company, Fond du Lac. Mr. Oldfield pointed out the difficult conditions due to the World War and the period of financial stringency that followed. Railways are still laboring under the same difficulties, he maintained. The deferred maintenance of way is, however, being absorbed and the tracks are being restored to good operating condition. Mr. Archambault's paper, in abstract, will be published in a later issue of the JOURNAL.

The final papers presented were one on advertising and selling transportation, by Fred. E. Eriksen of Milwaukee, and one on popularizing safety among platform men, by Chester K. Thomas of the Chicago, North Shore & Milwaukee Railroad. Abstracts of these papers appear elsewhere.

In connection with the meeting a series of inspection trips over the property of the Milwaukee Electric Railway & Light Company were held Thursday afternoon. These were well attended. One party was taken to inspect tracks, paving and overhead and the other to inspect the Cold Spring shops and the Fond du Lac Avenue car shops. Both were taken in buses as the guests of the railway.

Getting Speed Despite Traffic*

By Thomas R. Tate
Of the Milwaukee Traffic Survey

WE HAVE developed the automobile, the electric street railway car, the motor bus, the high-speed railway and the electrified suburban and interurban railways to such a point that the speed limit under present conditions appears almost to have been reached, and we are now forced to turn our attention to the improvement of these conditions of operation and the improvement in the methods of controlling and regulating traffic, of reducing traffic interference, delays and stops and of providing for a separation of the kinds of traffic and a separation of traffic of different speeds.

There are several methods of accomplishing these results, some of which are more or less permanent, others semi-permanent, and still others of a temporary nature. One of the first remedies to apply is police regulation. This includes traffic control by officers for the most congested and the busiest intersections, patrol of important traffic arteries and the enforcement of all traffic regulations and parking restrictions. The traffic officer can do much to improve the speed of traffic, clear up congested intersections and enforce traffic regulations.

Some cities of fairly large size handle practically all of their traffic by traffic officers, and few, if any, automatic or semi-automatic control lights are used. Kansas City, Mo., is a notable example, the officers being selected for their task and trained and instructed so that there appears to be co-ordinated movement with practically no delays, the signals being changed every ten to 40 seconds. Here there is also a spirit of co-operation between the traffic officers and the street railway and bus operators to such an extent that movement through the congested center is considerably speeded up and the public transportation agencies are given the signal to proceed practically as soon as loading has been completed.

Whether the hand-operated semaphore, with or without lights at night,

**Abstract of a paper presented before the Transportation Section, Wisconsin Utilities Association, Milwaukee, Wis., Aug. 18-19, 1927.*

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or the whistle is used is perhaps a matter of opinion in which we may differ, but to the average observer it appears that some sort of signal to proceed or stop is essential, and that the traffic officer or signal be so stationed and illuminated that he or it is at all times clearly visible.

Traffic officers on motorcycles or in automobiles can do much to enforce the rules of the road in keeping slow-moving vehicles to the right, clearing up traffic blockades and in preventing reckless driving; they are, therefore, indispensable in any system of traffic control.

Patrolmen and mounted police can effectively enforce traffic regulations and parking restrictions. Without the enforcement of them and without prosecution and penalization of offenders the best traffic regulations are of little value.

Use of traffic control lights to speed up traffic movements has become so general that many of our small villages throughout the country have installed one or more at busy intersections to enable pedestrians to cross the street with safety. Certainly the traffic on some of our important highways, especially during periods of maximum movement, is so great that without the use of either traffic control lights or traffic officers it is almost impossible for a pedestrian to cross the street with safety or for crossing traffic to break through without danger of accident. The installation of traffic control lights at the busiest intersections would break up the traffic flow into a platoon or wave movement so that it would be possible for cross traffic to proceed across the highway during the gaps in the movement on the principal highway, even though not controlled by traffic lights at the intersection.

Traffic control lights have come to be recognized as a necessity in our large cities. The speed with traffic control lights depends on their method of operation. Synchronous control until recently was used almost universally, but it has several disadvantages and delays traffic unduly. The reciprocal system, where red and green lights are alternated, has some advantages, but may actually slow down the movement of street cars and buses through the congested area. The progressive or co-ordinated system may be worked out so that if set for a given speed for street cars and buses vehicular traffic can move at higher speeds where safety zones are provided and where there is sufficient room between the safety zone and the curb.

The fault to be found with most existing automatic traffic control systems is that when there is little traffic flow the lights are unnecessary and could very well be dispensed with. This is particularly true in some of the smaller towns and villages located on important highways which are crowded to capacity on Sundays and holidays, but have perhaps practically no traffic flow during the remainder of the week, and this is also true of some of the locations in our larger cities at intersections where there is little movement after midnight or between 1 and 6 a.m.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Sept. 1-3 — **National Electrical Manufacturers Association, Policies Division, meeting, Association Island, N. Y.**

***Sept. 1-4*—Tenth Annual Conference on Human Relations in Industry, Silver Bay on Lake George, N. Y.**

***Sept. 7-9*—American Society of Mechanical Engineers, Machine Shop Practice Division, first national meeting, Mason Laboratory, Yale University, New Haven, Conn.**

***Sept. 8-9*—Central Electric Railway Master Mechanics Association, Hotel La Salle, South Bend, Ind.**

Sept. 13-15 — **International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting, Book-Cadillac Hotel, Detroit, Mich.**

***Sept. 26-30*—National Safety Council, annual congress, Hotel Stevens, Chicago, Ill.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

Traffic Regulation Must Be Reasonable

Of paramount importance in the control of traffic is the necessity of proper regulation. The public in general will not support the enforcement of a law or ordinance of which it does not approve, nor can we expect traffic officers to enforce any traffic code with which the public is not in sympathy. Many of our city ordinances and state laws regulating the movement of vehicles are antiquated and need frequent revisions. No one could be expected to observe the following sign:

State Law
Speed Limit
5 Miles Per Hour

Similar signs may be seen all over the country, some specifying 10 miles an hour, some 12, others 15, but any one who observes such a sign, although conforming to the law, may be obstructing traffic and, if so, ought to be forced to move faster or get off the highway or street.

With the degree of perfection attained in the modern automobile, with four-wheel brakes properly adjusted, speeds of 25 m.p.h., and, in some cases, even 30, 35 to 40 m.p.h. on arterial highways of sufficient width with proper paving free from holes, bumps or obstructions of any kind, where the vision is unobscured, and taking the weather and conditions of the pavement into consideration, could be permitted with safety. Under other conditions speeds of even 15 m.p.h. might be excessive or dangerous. More attention should be given by our cities, counties and states to the widths of streets and highways, the character and type of paving and its condition, and to the removal of obstructions to both movement and vision.

The removal or increase of the speed limit on street cars would also speed up street car traffic somewhat, as a street car can operate at 25 to 35 m.p.h. with almost the same safety as an automobile, as it can start just as quickly and under most conditions can in an emergency stop more quickly, but is forced to operate on tracks and cannot swing out to avoid a collision as can an automobile. For this reason more care should be taken by vehicles crossing street car lines than in crossing an important traffic artery. The protection of traction lines by stop signs, caution signs or flasher warning signals would assist materially in improving the speed of operation and would be of as much if not more benefit to the general public than the designation of certain streets as arterial highways provided with stop signs for all crossing traffic.

Parking Restrictions and Widths of Streets

Parking restrictions also have definite effect upon speeds, the less time allowed for parking the more cars that can be theoretically parked in a given block, the more backing in and out there will be obstructing traffic lines, and the more difficult it is to enforce parking restrictions. The parking of vehicles on a traffic artery, which is not wide enough to accommodate moving traffic also, should be prohibited altogether, restricted to one side of the street, or restricted to the hours of the day when it does not interfere with freedom of movement.

Ten feet should be provided for each moving lane of traffic and at least 8 ft. for parking automobiles parallel to the curb. This necessitates a 36-ft. roadway for two traffic lanes (one in each direction) and a 56-ft. roadway for four traffic lanes (two in each direction) without street cars. With street cars the width should be increased by 20 ft. in order to provide for freedom of movement for both kinds of traffic.

Where, for certain reasons, parking cannot be eliminated or restricted and the street or highway is insufficient to accommodate the traffic, the streets may be made one way thoroughfares and traffic movement speeded up, as more traffic lanes may thereby be made available and where there are street cars the entire right-hand side of the block may be roped off and used for a loading zone. The disadvantages offered by one-way streets, especially in the central business district, make their adoption without thorough study open to question.

The elimination of left-hand turns, of U turns and of the stopping of vehicles in the traffic lane for loading and unloading on the busy and more congested streets is one means of speeding up traffic, although not always adopted or enforced.

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Streets occupied by street car lines usually develop into business districts and may become important highways leading into the city or connecting different centers in the city. Because of the business fronting on such streets and the through traffic making use of such streets considerable congestion results, especially on streets of insufficient width to accommodate both kinds of traffic. Finally, the situation reaches such a state that street cars cannot be operated with any speed nor can vehicular traffic where they interfere with each other. The final solution of this problem is either the prohibition of parking altogether, partial elimination during periods of maximum movement, or the widening of the street. The latter is the remedy of a permanent nature, while the former is more or less a temporary expedient. Separation of street car and vehicular traffic, by setting aside some of the streets for vehicular traffic, does not solve the problem altogether, and while it may divert most of the through traffic it does not remedy the condition brought about by the vehicular traffic of the local business districts.

The average speed of the street car systems in most of the large cities of our country is not over 10 m.p.h. for the system as a whole, gets down to 3 m.p.h. or less in our central business districts and does not exceed 12 or 15 m.p.h. in our outlying residential districts or suburbs. There are several ways in which the average speed may be increased, such as partial elimination of stops, use of safety zones for loading and unloading, two-car or train operation, and rapid transit on private right-of-way.

The final solution of the transit problem for our large cities, after they have reached a population of 1,000,000 or more, is rapid transit on private right-of-way, elevated structure or subway, or a combination of any two or of all three. This permits of a complete separation of passenger traffic from vehicular traffic, and both express and local service can be furnished with train operation. Average speeds of 18 to 25 m.p.h. may be obtained and outlying sections and suburban communities brought nearer to the business center by reducing the time of travel to one-half or less that required by street cars and in our large and more congested cities to less than that which could possibly be obtained by buses or automobiles operated on the city's streets.

Advertising the Transportation Business*

By Fred E. Ericksen
Advertising Manager the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

WHY advertise? There is so much to tell in the transportation business, and since advertising in its simplest definition is telling, need we ask the question? Tell your transportation story over and over again with all the means and mediums at your command. But tell your story truthfully. Omit any bunk. Don't camouflage or try to cover up. Surely the simple true story of the transportation business and its intimate relation to a community's economic and social welfare will so keenly interest and impress your readers that much of the distrust and misunderstanding and false conceptions that now prevail in varying degrees will largely, if not entirely, disappear. I cannot conceive of a business where advertising, intelligently employed, can mean so much and accomplish so much good as in the transportation business.

Advertising is a profession and your advertising should be intrusted to those qualified by experience and maturity properly to employ advertising technique, for advertising has its own peculiar technique, like any other profession. Engage the best advertising talent you can get. Give it every opportunity to dig down to rock bottom facts about your business. Let your advertising manager in on all your plans. Work with him. Personally supervise and direct his efforts, and let that supervision and direction come from the biggest man in your organization—one who has intimate contact with the public and whose heart feels the public's pulse. Thoroughly imbue your advertising manager with the responsibility of his position, designating an executive as his immediate superior and not subjecting him to the whims and fancies of committees, conferences and subordinates, all too often aliens to the advertising profession. Lend dignity to his position by the manifested regard you hold for his work and his knowledge of advertising technique.

Don't Spoil Good Copy

Let his inspirational copy appeal stand unspoiled by some one far removed from advertising or who cannot understand that good advertising copy is inspired by public contacts and outside viewpoints. In the transportation business, as in any other business, you cannot hope to produce good advertising copy if it dies aborning, strangled by slide-rule findings and engineering formulas. Advertising must breathe of humanity. It must reach the masses in a language people understand and will respond to. It must carry a message that rings true. It must be simple, direct, sincere and logical. And in transportation advertising especially the more simple and direct the message the greater confidence it will inspire.

On the other hand, I have no patience with ad men and copy writers who consider themselves little gods unto themselves. You who "write your company's advertising" are wise if you draw upon the counsel and experiences and knowledge of others. You are especially fortunate if some one designated company executive is your immediate superior and to whom your department must report directly. I know,in my own case, it is always extremely helpful and encouraging to know that I can always seek the advice and further suggestions of an executive of my company. I know that nothing but the facts will be presented. I know, also, that the criticisms offered will be based on mature judgment, an impersonal viewpoint and a more comprehensive understanding of what our transportation problems are.

Always Have Something to Sell to the Public

Advertising and selling transportation successfully involve two important factors:

1. That you have something to sell which the public needs and ought to have.

2. That you tell about it and keep on telling it in such a manner that the public knows about it and believes it.

What have we to sell in this business? The most dependable, efficient, economical and practical mode of transportation in existence today. Time was when we were an undisputed monopoly, when one either rode the street cars or walked. But today, for example, there are more than 72,000 privately owned autos in Milwaukee alone, with no let-up in the desire of many present non-owners to possess autos soon. Recent models are these autos—precious few of 1910, 1915 or even 1920 vintage. Convenient and fast. Expensive and still an unwarranted luxury to many, regardless of the cleverly worded auto editorials. Unwisely used by most of their owners. A real burden to many. But this is a silk stocking age. It may be fundamentally wrong and economically unsound that high school girls and store clerks wear silk stockings, but "try and tell 'em different." The order changeth, and if you are to sell transportation your advertising appeal must conform to the wishes and demands of the day.

What are we to do about it? What are the leaders in transportation doing? Providing the latest in street car comfort and design—smooth-running cars, speedy, well ventilated, clean and pleasing in appearance. Schedules are being maintained with a reasonable degree of regularity. Service is more frequent. The rolling stock is maintained in shops equipped with the very latest in machinery. Traffic demands are constantly checked. Cars are frequently inspected. The safety factor is diligently observed. Trainmen are carefully selected and trained and supervised. Courtesy is as much a qualification for operators as is personal appearance. Roadbeds are kept to a higher standard. Cars are painted more

*Abstract of a paper presented before the Transportation Section, Wisconsin Utilities Association, Milwaukee, Aug. 18-19, 1927.

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frequently. Transportation utility executives actually ride in street cars, rub elbows with the daily riders and hear both praises and curses. Economy is eagerly sought for that fares need not be increased. Transportation employees are contented, self-respecting, well paid and loyal. Promises made are kept. Complaints are promptly and courteously answered.

Perhaps you cannot advertise that you do all these things. Perhaps you can offer no immediate prospect of providing even a few of these desirable features. Still, advertising can help you sell transportation by first making friends. But unless you make some effort to be friendly, unless you seek friendship, unless you take folks into your confidence, unless you advertise what your transportation problems really are, you cannot hope to gain friends. Get your story, whatever it is, first to the public. Be on the offensive, not on the defensive. Forced advertising creates doubt and suspicion and a suspecting public is never a friendly public.

Stick Closely to Facts

Tell facts, be they pleasant or otherwise. The problems of a transportation utility are also the public's problems. Only the public doesn't always appreciate this. Don't dodge or belittle complaints. A minor complaint honestly satisfied or promptly answered will often make many stanch supporters. I know of a transportation utility where every complaint received by mail goes to the president, who personally investigates the complaint and answers it. It takes time, but it pays. It helps sell transportation, because such consideration wins friends. Incidentally, it improves service because the knowledge that all complaints go to the boss spurs every employee to watch his step.

Advertising is necessary to selling transportation, that the public may continue to be sold on the merits of the service rendered. The public soon takes good service for granted, and unless it is constantly reminded it quickly forgets or becomes indifferent. There is also the constant influx of new folks in your community who know nothing of your transportation facilities and excellencies. And then there is ever the new crop of potential patrons just reaching their maturity, new workmen, new clerks, new office workers and on down the list of our complex busy civilization. Even the big men in business, driven daily to their plants and factories and stores by private chauffeurs, are deeply concerned about transportation, for it is the dependable, always on the job street car that brings the workers to the places of industry. And forget not that, in this day and age, mother no longer lives all day in the kitchen. She, too, must find conveyance that will bring her quickly, economically and comfortably to the afternoon's destination and back home again. And in your advertising play up to this tremendous potential market.

Advertise not for the sake of advertising, but with a definite objective in mind. Advertise truthfully and fearlessly. Transportation advertising has such a tremendously interesting human appeal it can be made outstandingly successful.

Popularizing Safety Among Platform Men*

By Chester K. Thomas
Division Superintendent Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

BY POPULARIZING safety I mean making it attractive and practical, energizing it, giving it that human appeal necessary to assure the active participation of trainmen in your program of accident prevention. If we are to succeed in accident prevention, it is highly essential that we secure the whole-hearted co-operation of trainmen. By virtue of their position they always will be the mainstay of any accident prevention program on electric railroads. Trainmen are no different from other people and, like the traveling public, they will discommode themselves to get the things they desire, but cannot be made to take that which they do not want. It necessarily follows that if we are to arouse enthusiasm for safety work among trainmen we have got to make them like it. It must be made to appeal to them as being something they want to do rather than something they are expected to do.

Electric railroad companies have the facilities for providing practical and attractive safety programs for trainmen which cannot fail to produce results even outside the field of accident prevention. Anything which tends to produce safe and careful operation of trains also tends to produce a more reliable and efficient service. It results in more systematic operation, better care of equipment, cuts down delays, improves the morale of the employees, helps to get them to thinking more about things worth while and in many other respects materially benefits the organization. I believe that a safety program if properly organized and carried on will more than pay its way in increased efficiency alone, to say nothing of the improvement in public relations which always follows when accidents decrease. Nothing will produce a hostile public attitude toward a railroad more quickly than a bad accident record.

The question which naturally interests you at this time is, "What can we do to make our safety program attractive to trainmen and at the same time produce the desired results?" The best I can do by way of answer is to give you my own personal opinion based upon experience after about eighteen years of active contact with trainmen.

I believe that the first essential is to get the program started right. In establishing a safety program on a railroad, I believe no mention should be made of the financial outlay occasioned by accidents. It must be given a human appeal right from the start, and the executive who begins by reciting the amount of money spent in accident claims for the past five years is building his safety program upon a foundation that is already beginning to show signs of decay. The trainmen are apt to put two and two together and class your humanitarian interests as fine talk to cover your real purpose, which is to save money for the company.

Unless executives believe in safety from a humanitarian standpoint they should be square enough to say so right off the reel and put their safety on the same basis as any other operating matter, meting out discipline to motormen for striking a tin lizzie as they would to a conductor for stealing a fare. Trainmen would then give you credit at least for being square, but if they have reason to think that you are preaching safety because you want to save money, the best you can ever get is half-hearted participation with the feeling that what they are doing is primarily for some one else's benefit. Then, too, some company officials like to attend meetings such as this and brag about the wonderful accident record on their property, forgetting always to mention that it is the men on the job who have made that record possible.

Let us assume that your safety program is founded on correct principles, that you have started it right, that you have given it the necessary human appeal and that apparently your trainmen are sold 100 per cent on the work you wish to have them do. The question then arises, how long will this continue? How long will this new-born babe live and grow? This question will have to be answered by each company engaged in safety work for itself, because it all depends upon what is done to make it popular and keep it popular after it has been started. I would like to give you a few suggestions which I consider practical to assure the proper growth and development of a safety program with trainmen.

In the first place, you expect them to do the actual work of accident prevention. Then let it be their safety program. Let them have their own chairman, their own secretary, their own program committee. Let them make and execute their own programs. Let them do their own talking. Com-

*Abstract of a paper presented at the annual meeting of the Transportation Section, Wisconsin Utilities Association, Milwaukee, Wis., Aug. 18-19, 1927.

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pany officials are not noted for their oratorical ability and trainmen can hardly be expected to attend safety meetings forever out of respect for the situation. All too often trainmen are compelled to remain at safety meetings for a couple of hours after the practical work of the meeting has been completed to listen to some company official tell them something they do not wish to hear.

Then, too, company officials quite often avail themselves of the opportunity offered by the safety meetings to get over a lot of information about something far removed from safety work. I do not believe that outside matters should be allowed to creep into the work of a safety organization.

I think, also, that a certain amount of pleasure should be mixed with the work of the safety meeting. A song now and then or some peppy music helps to bring them out to the meeting and send them away happy. This is never difficult to arrange for, as you will always find plenty of talent among the men themselves to provide for this feature of the safety program.

Aside from the actual conduct of safety meetings themselves, there are a great many practical things a company can do to keep up interest in safety work and to get actual carry-over of safety ideas on the job. In the first place, the safety engineer or person in charge of the program should be a practical fellow and, above all else, he should have a friendly, likable disposition. He should understand men and should make a study of trainmen and train service work in order to be able to determine something of their state of mind and their habits of thought and predict what reaction he is likely to get to the various things he will want to do in connection with the carrying out of the safety program.

He should be given wide latitude in the safety work of the company and should be a part of the operating staff of the superintendent's office. I believe he should be empowered to do more than merely make recommendations and should have authority to do whatever seems necessary to promote safety work among the trainmen unless the expense involved is such as to warrant its having to go before the budget and expense committee. I do not mean by this that he should not have the approval of the superintendent in matters of this kind, but rather that the superintendent should be willing at all times to co-operate with his field representative in safety matters rather than advance reasons as to why the proposed measure should not be carried out.

I think, also, that there are many practical things which might be done to assure trainmen that the company's interest in accident prevention is sincere. For instance, if a trainman is seen to be ill or if he has just received some news of a shocking character it would be a good plan to go to him and say, "You had better go home. You cannot do your work safely under the circumstances. Put in a time slip for the remainder of your run." The next day every trainman on the road would know about it and it would be evidence to them that the safety program meant something more than fine talk.

Then, too, the home life and environment of trainmen should be closely watched and whenever a trainman is found to be in trouble because of sickness or something of a similar nature and has become involved in financial difficulties it would be a good plan to advance him a loan to relieve him of his mental worry, telling him at the time you do so that, aside from your desire to help him, you realize that he cannot work safely if he has to worry over a matter of that kind.

The superintendent should commend his trainmen occasionally for their interest in safety work and for the good record they have been able to make. An occasional list should be posted showing the number of men who have been able to go through the period without an accident, making no reference whatever to the ones who have had accidents. It is fatal to discuss a trainman's poor accident record with any one except the man himself.

Most companies have house organs. I believe this is one of the best instruments at their disposal for boosting the safety program among the trainmen. It should always contain a column or two of safety news, showing the pictures of such employees as have rendered distinguished service in accident prevention and featuring the safety program generally. In a very short time trainmen will eagerly scan the pages, hoping to see their names in print or their pictures, and in this way you can reach practically every trainman on the job with suggestions for the betterment of the safety program and can do it in a subtle sort of way that will appeal to them.

Many other things might be done to help maintain interest and keep the safety program popular among platform men, but lack of time prevents me from detailing them further. I wish to leave this thought with you in closing, that the big thing is to start out right, forget about the financial end of it, make your program one of human interest, sell it to the employees right off the reel, let them begin by feeling that it is their program, run for their benefit, and, once you have started, remember that it has to be continually energized if it is to be popular. Use every facility at your command for keeping it alive. Do not feel that all you have to do is start in and then leave it to some one else to carry on. And above all, don't fail to place the credit for success where it belongs, and when you have succeeded in reducing accidents and have hung up a record of which your organization can justly feel proud, go out and tell about it if you want to, but don't forget, when you are doing so, to tell them that the men on the job are the ones who did it.

Bus and Car Co-ordination Promote Safety*

By F. M. Holaday
District Manager Wisconsin Power & Light Company, Oshkosh, Wis.

WHILE all transportation officials are agreed that the bus has a place in the field of passenger transportation, no one has definitely described this field of service. There are a few places where bus transportation will fit into any city in new territory where the travel is light and will not warrant the investment necessary to build track and overhead. In the larger cities the bus can serve as a cross tie to permit the patrons to go to different sections of a city without going to the downtown terminal or transfer point. That is, a passenger in the northeast part of town can board a street car, ride to the crosstown bus line, and transfer to a line going to the northwest part of town. This will cause the passenger to make two transfers, but with properly co-ordinated schedules he will arrive at his destination much sooner than if he had gone downtown and transferred to the northwest street car line. In all of these cases the co-ordinated transportation by bus and car not only gives the patron better service, but decreases the chances for accidents.

Every city has its center point, from a country store in the small town to the Loop of Chicago or Times Square in New York. From this central point the population extends in four ways, and the density of population and vehicular travel decreases in ratio to the distance from the center, and with this decrease in population and travel and with it a decrease in accident hazards. Every car and passenger that can arrive at his destination without going through this zone, reduces the chances of an accident in ratio to the number of other vehicles on the street. One less passenger downtown means that the thousands of automobiles will have one less mark to shoot at. This reduction in passengers can be accomplished by proper co-ordination of bus and street car operation to carry the transfer passengers around the center of town, and transferring them in the less congested part of town. This also will tend to increase the schedule speed, as the time necessary to load a passenger increases very greatly, when a large number try to get on the car at the same time, and hazards increase also. The highway commissions have recognized the soundness of this principle, by building belt roads around a city for the use of through traffic.

*Abstract of a paper presented before the Transportation Section, Wisconsin Utilities Association, Milwaukee, Wis., Aug. 18-19, 1927.

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In the outlying districts the opposite is true. Where a car is compelled to make frequent stops for one or two passengers, the over all schedule speed is slowed down, and the cost of operation increased out of proportion to the revenue of this line. By using small buses to carry the patrons from the sparsely settled district to a point at the edge of the more densely settled district, the speed of the cars can be increased with respect to the number of passengers carried. In selecting this point, a very careful traffic survey must be made, to decide at what point the car picks up enough passengers to warrant the delay of stopping, and then locate the transfer point as near to that point as possible, taking into consideration the problem of vehicular congestion.

Other Places for Buses

The ideal place for the direct transfer would be on private property, next on a side street, and then at the widest point on a main street, where traffic is lightest. Schedules should be so coordinated that the bus will arrive long enough before the car, for the passengers to be ready to unload when the car arrives, without hurrying, but not long enough to cause the passengers to wait. Also, buses are lighter, more flexible and, consequently, easier to handle in heavy traffic than a street car.

The points which I have mentioned are general and can be applied to most any town or city, and considered as feeder or transfer service. There are, in addition, special conditions where it is advisable to run through bus service. In one city where I became familiar with the situation, the business men in one section of the business district lived in the same section of town that was served by the street car, which came downtown by a rather round-about way. Bus service was started over a direct route but entered the congested section of town from a different side. This served two purposes. It decreased the number of people boarding and leaving at transfer points, and also secured new business of men who would ride a bus but not a street car, leaving their automobiles in the garage, and relieved the vehicular congestion materially.

In another instance a large manufacturing concern employing a large number of men, mostly foreigners, was located on an outlying district and the foreign colony was located quite a distance from the factory. Here bus service was given between these two points, and the street cars were relieved of a large number of passengers who were always mixed up in accidents. The accidents on the street car line were decreased almost 75 per cent, while the number of passengers carried was only reduced about 25 per cent.

I believe that if any management is considering expansion, if it will consider the points brought out and can adopt them through the proper combination of bus, or bus and railway service, the over-all schedule speed can be increased and at the same time accidents can be reduced.

American Association News

Anna Case to Sing at A.E.R.A. Convention

WHEN New York City, for example, gave such an unprecedented welcome to Colonel Lindbergh on his triumphant return to his country, it was Miss Anna Case who was selected to sing the "Star Spangled Banner" from the official reviewing box in City Hall.

Anna Case

It was also Miss Anna Case who sang the national anthem at the formal opening of the Democratic national convention in Madison Square Garden.

Again it was Miss Anna Case who was the soloist at the reception given to the Crown Price and Princess of Sweden at Detroit and it will be Miss Anna Case who sings, on Oct. 4, for the delegates and visitors assembled at the American Electric Railway Association in Cleveland.

Advance Registration and Guest Tickets

FOR this year's annual convention at Cleveland, the American Electric Railway Association will register in advance not only members planning to attend, but also their guests, for whom members desire to provide the complete convention facilities, including the entertainment features. It will be a great convenience to members in saving time at the registration desk, if they see to it that they are registered in advance. There is no commitment in advance registration, and anyone who is at all likely to attend the convention should be so registered. No notice to the association is necessary in case it develops that a member or guest cannot attend. Those who do not register in advance necessarily will be delayed in getting their badges and credentials at the registration desk, and this year a special card is provided for members and guests to present at the desk, showing that they have registered in advance.

Companies in the vicinity of Cleveland which desire to provide for the admission of their employees or others interested in the convention can do so by securing a special guest ticket. This applies particularly where employees will visit the convention for only one day and where it is not necessary to provide for the complete privileges of the convention, including the convention entertainment features. These tickets will be collected at the door and are good during any day the exhibit is open, from 9 a.m. to 6 p.m. Members are requested to order these tickets in advance from association headquarters.

Certificates for Convention Tickets

EACH of the trunk line passenger associations has authorized the sale of round-trip tickets to the convention in Cleveland at the rate of one and one-half the single way fare on presentation of a special certificate on the purchase of the ticket at a local ticket office. One certificate is good for any member of the association, including dependent members of his family. These round trip tickets may be purchased for the going trip beginning Sept. 29 to Oct. 5, inclusive. On the return trip the passenger must reach original starting point not later than midnight of Oct. 13, 1927, and must make this trip by the same route as the going trip. Tickets issued at the reduced fare will not be good on any limited train on which such reduced fare transportation is not honored. Stopover privileges are provided in accordance with certain regulations which can be ascertained from the local agent.

Return tickets will be validated at Cleveland, Ohio, by agents at the regular ticket offices of the lines over which tickets read into Cleveland, Ohio, or at the registration desk, where agents will be available from Oct. 3 to 7.

Certificates may be obtained from Executive Secretary J. W. Welsh, 292 Madison Avenue, New York City.

Addressing Convention Mail

MANUFACTURERS who expect mail or telegrams at the Cleveland Public Auditorium during the convention should see that they are addressed as follows:

Mr. .....
..... Company
Spaces No. .....
Cleveland Public Auditorium, Cleveland, Ohio.

Railway delegates who contemplate receiving mail or messages at the convention hall should have it addressed as follows:

Mr. .....
c/o A.E.R.A. Registration Office, Cleveland Public Auditorium, Cleveland, Ohio.

It also is suggested that return addresses be noted on all envelopes.

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News of the Industry

St. Louis Claims Funds from Excess Fares

Approximately $85,000 collected by the United Railways, St. Louis, Mo., during three weeks last February, when an 8-cent fare was put in effect under a federal court order, has attracted the attention of state officials at Jefferson City, Mo., who believe they can annex the cash for the state treasury.

Assistant Attorney-General Smith B. Atwood has been in St. Louis investigating the laws and the facts connected with the $85,000 and is considering filing an intervening petition in the United Railways receivership before Federal Judge Faris. The state will seek an order on the St. Louis Public Service Company, which bought the railway on Aug. 1, to deliver the funds to the state.

The state will take the position that a subsequent ruling by a special court of three Federal judges sitting at Kansas City, Mo., suspending the 8-cent fare order of Federal Judge Reeves, under which the higher fare was temporarily collected, was proof that the railway was not entitled to the money and cannot retain the excess collected even though the car riders did not take the trouble to save receipts for the extra cent paid. Patrons who did demand the receipts were later reimbursed for the excess payment.

Transfer System in Los Angeles Contingent on Fare Settlement

A universal transfer system under which each city bus and street car system in Los Angeles, Cal., will accept passengers from the other will be put into operation provided the State Railroad Commission grants an increase in fares to 7 cents, according to a stipulation revealed at a recent hearing before the Railroad Commission. The transfers would also be good on any of the bus lines operated by either the Pacific Railway or the Los Angeles Railway and also on the Los Angeles Motor Bus Company's local line.

It was suggested that in the event that the commission desires to modify the application for a straight increase in fare, a universal transfer system be tried for six months without fare increase, but with a charge of 2 cents for each transfer.

J. G. Mott, chief engineer of the commission, recommended the use of one-man cars in outer districts during the entire day and in the downtown districts in the evening hours, as a means whereby the company might increase its revenues. Mr. Mott also offered the suggestion that the fares for occasional riders be increased from 5 to 10 cents, but that daily patrons be permitted to buy ten tokens for 50 cents. He also suggested what he called a "one-man, two-man" operation of cars. Under this system the cars in outlying districts would be operated by one man, but in the downtown area, where traffic is congested and the patronage heavy, a conductor would be taken on who would remain only through the business districts.

A zoning system was also mentioned whereby car patrons could ride from any point in the city into the downtown area for a nickel, but a trip through the downtown district, from one end of the car line to the other, would result in an additional fare.

Wage Requests of Seattle Men Denied

Requests of the trainmen of the Seattle Municipal Railway, Seattle, Wash., for wage increases have been denied by the City Council, in preparing its budget for next year. Among the demands made was one from operators of one-man cars. They ask $180 a month; they now get $150 and $155. Platform men on two-man cars want a flat monthly salary of $175 instead of the present rates of 67, 74 and 77 cents an hour. All railway employees have asked for a five-day week, but this was also denied by the Council.

Amalgamated Defends Chicago Companies

Union document unusual in its tenor, extremely frank in what it says and deeply significant because of its recognition of the rights of the employer. Trade union an opportunist movement

THE general tenor of the resolution pertaining to the local railway franchise issue at Chicago, indorsed at a meeting of the Chicago Federation of Labor held on July 17, has moved the Amalgamated Association at Chicago, in justice to the more than 20,000 union employees of the local companies, to question the wisdom and justice of continuing a policy of attack, with no practical constructive alternative, on union employers that have had contract relations with their union employees for more than 25 years.

Two Amalgamated officers were appointed to the committee that considered the resolution of the federation, but it came up for consideration when they were in the midst of contract negotiations and they did not find the time to serve. In addressing the officers and delegates of the Chicago Federation of Labor the Amalgamated reminds them that the proposed franchise is a matter that should deeply concern them, "for the welfare of the 200,000 members of our union who help to operate these properties is directly involved." The Amalgamated officers say it is only natural to expect that the railways, when seeking a franchise, will try to get the best legislative deal they can, just as our unions try to get the best conditions we can when negotiating contracts with them." They then say:

In franchise and other legislative matters, however, we have executives, legislators and Councilmen charged with the duty of looking after the public interest. All are answerable to the voters. It is our belief that it is not within the scope of our trade unions to try to settle all the questions of community or nation. Our efforts, to be effective, are limited to the industrial and economic field. The trade union is an opportunist movement, and recognizing the soundness of this position the Amalgamated employees are about to seek conditions that will serve to protect our unions and benefit of all the multitude of organized workers who are employees in the local electric railway industry in any traction franchise that may be proposed in this city.

As the representatives of more than 20,000 union employees, the Amalgamated officers are tired of being confronted with charges of bad faith by the representatives of these companies as expressed in the hostile attitude of the central body in this and other similar resolutions. They believe the spirit of these resolutions embody a wrong policy and, when properly analyzed, an anti-union policy that has a tendency to promote bad feeling instead of good will between these companies and their union employees. They then say:

As citizens the delegates to this federation have an undoubted right to express themselves on public matters, but as trade unionists looking to the welfare of the organized labor movement in this city judgment should be used in attacking indiscriminately employers who have made contracts continuously with the unions of their employees for more than a quarter of a century.

When we stop to consider that the local traction companies, surface and elevated, employ more union men and women than any other employer of labor in Chicago, it must surely cause us to reflect that as trade unionists we should show a decent regard at least for the long-continued recognition by these employers of the collective bargaining principle on a bona fide trade union basis. For more

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than 25 years these employers have not only been entering into and carrying out contracts with the Amalgamated Association, but their contract relations extend to other unions of the crafts, so that approximately 25,000 members of trade unions are in the employ of these companies.

Recognition is made that at contract expiration periods the Amalgamated had had its differences with the companies employing its members, and no doubt will continue to have them, but "we have managed to maintain the union relation with these companies for more than 25 years, and we have made remarkable progress." The document then says, in part:

The almost insurmountable difficulties that have confronted everybody allied with the electric railway industry, both executives and rank and file, for many years, and particularly since the World War, are little understood by those not directly connected with it. When war drove costs skyward the revenue possibilities of our industry remained stationary, all law-imposed. The industry suffered and deteriorated and its workers had to bear a heavy burden. Having experienced these hardships, we who follow this industry for a livelihood resent, and we feel justly, the unreasonable attacks upon it. The electric railway industry has had its "barons" in the past and may have some of them now, the same as all other big industries, but the average electric railway executive of today is fighting to overcome the sins of his predecessors and earnestly striving to operate on a legitimate business basis.

Ours is one of the few industries in the nation that is buck-sawed, hemmed in and hamstrung by near statesmen and professional objectors because of its public nature and the legal restrictions surrounding it. Adequate wages depend upon adequate revenue, and under efficient operation adequate revenue is almost wholly a matter of adequate rates. Public commissions establish the fare rates and thus indirectly establish our wage rates. We hope this federation has not forgot the bitter experience we had in 1922 when the Illinois Commerce Commission forced a wage cut of 10 cents an hour on our 20,000 members in Chicago.

Practically every group of workers represented in this federation may agree with their employers on a wage increase, and the cost is passed to the consumer without any public agency interfering. That cannot be done in our industry. The state commission and perhaps the courts intervene and we are subject to their decisions. As a result, under the present unreasonable restrictions that surround the operation of the local railways, it is becoming increasingly difficult to establish an adequate wage for the employees, such as many of you workers enjoy.

We realize the railways are well able to defend their own position. but as trade unionists we ask for fair play from this federation for an industry that is struggling to free itself from the iron-bound restrictions that came from the errors of the past; an industry that is now attempting to meet the needs of a progressive city and to expand on a proper service basis. Chicago is growing and extending by leaps and bounds and our electric transportation system, the best in the world, is remaining at a standstill. This is helpful neither to the public nor employees.

The Amalgamated officers say it is time serious thought be given to the needs of the industry that plays so important a part in the development of the city, with an earnest desire to play fair in giving it the necessary relief, instead of attacking and opposing every move that is made along this line, without giving the question proper study or consideration. Members of the federation are reminded:

How many delegates to this federation realize the hard struggle the railway industry has had to perpetuate itself the past ten years? Automobile, taxi and bus competition has injured our business seriously and in many places has wrecked us.

We say to the delegates to this federation that the franchise matter is entitled to fair and thoughtful consideration. Trade unionism, as we understand it, should certainly assure a feeling of amity for employers who co-operate with their employees on a bona fide trade union basis, and that is the situation with the Chicago companies. All we ask of this federation is the same fair play and consideration for the industry from which we gain our livelihood as is given other union industries. If unionism is to mean co-operation it cannot be one-sided. Our union label is exposed on the breasts of 20,000 car workers in Chicago every day. This federation and its officers helped to place it there. We aim to keep that emblem of freedom—the union button—before the millions of citizens who use daily the union-operated electric railways of this city, and we ask the same consideration for the union label of our industry trade unionism advocates for the union label of all other industries.

In conclusion, the Amalgamated officers request the delegates to the federation in deliberating and passing upon franchise proposals in the future to give reasonable consideration to the long-continued trade union connections of the local railway properties and the welfare of their 25,000 union workers.

They Straighten Out the Kinks

THREE traffic and transportation experts of the Peoria division of the Illinois Power & Light Corporation use motor cycles to flit hither and yon around Peoria and its environs, straightening out traffic congestion, lifting broken down coal wagons off the track, returning lost children to the bosom of their families, getting conductors change for $5 bills and otherwise assisting in maintaining an on-time schedule over the entire system.

St. Paul Electrified to Seattle

With the opening of a 10-mile extension to the western terminal of the Chicago, Milwaukee & St. Paul Railroad, Seattle is now a terminal of the longest electrified railroad in the world. In recognition of this event, Mrs. Bertha K. Landes, Mayor of Seattle, piloted the 260-ton electric locomotive hauling the first train into Seattle from Black River junction, where it formerly had been necessary to change to steam.

All trains, including the two through passenger trains, the Olympian and Columbian, as well as the Ranier Park Special between Seattle and Tacoma, are now drawn by General Electric 260-ton gearless electric locomotives into either Tacoma or Seattle.

This extension brings the total electrification of the St. Paul road to 655 miles. The route is from Harlowton, Mont., to Avery, Idaho, a distance of 440 miles, and from Othello, Wash., to Seattle and Tacoma, a distance of 215 miles. Five mountain ranges are crossed.

The first step in the road's electrification program was taken in 1915 with the application of electricity to the Rocky Mountain division between Three Forks and Deer Lodge. In 1916 electrification was extended to Harlowton and westward to Alberton, and to Avery in the spring of 1917. So successful did this stretch of 440 miles prove that a few years later the Cascade division between Othello and Tacoma was electrified, leaving a gap of only 220 miles between the two electrified zones between the Cascade and Rocky Mountain ranges.

I.C.C. Inquiry Into North Shore Rates

The Interstate Commerce Commission on Aug 19 instituted an investigation into interstate and intrastate passenger fares of the Chicago, North Shore & Milwaukee Railroad in order to ascertain whether the lower interstate rates are affecting interstate commerce. The North Shore petitioned the commission to intercede in ascertaining whether such discrimination against interstate commerce was in effect. It was pointed out that interstate passenger fares in the states of Illinois and Wisconsin over the Shore line are lower than its interstate passenger fares and the carrier is not permitted by authorities of these states to increase its intrastate fares in order to overcome the discrimination against interstate commerce. Hearings have been assigned at Chicago.

Three Federal Judges Will Hear Columbia Railway Argument

Judge Ernest F. Cochran of the United States Eastern district has decided to convene a court of three federal judges to hear the application of the Columbia Railway, Gas & Electric Company, Columbia, S. C., for an interlocutory injunction restraining the South Carolina Railroad Commission from enforcing its order No. 356 requiring the company to restore street railway service discontinued March 11. In his order Judge Cochran refuses to issue a temporary restraining order pending hearing of the application for an interlocutory injunction. After outlining the grounds under which he issued his order, Judge Cochran stated that the application for an interlocutory injunction should be heard before three judges and that the court would call to its assistance two other federal judges.

The motion for a restraining order pending the hearing by the three judges was refused without prejudice, however, to the right of the plaintiff to renew its

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motion in accordance with the views set forth in the court's decision and the plaintiff will be at liberty to present to the three judges all of its grounds for relief, the same as if the present order had not been made.

In giving his reasons for declining to issue the temporary restraining order Judge Cochran states that the case as presented does not appear to show that the plaintiff will be subject to heavy recurring penalties or to a multiplicity of suits, or to such an exorbitant penalty that it could not safely risk incurring it.

Sunday Pass on Eastern Massachusetts

Since July 10 the dollar Sunday pass has been in vogue on the lines of the Eastern Massachusetts Street Railway, Boston, Mass., established to stimulate riding to the beaches, parks, lakes and other summer resorts. This excursion rate means an unlimited ride over a system of 650 miles and benefits nineteen cities and 54 towns. The tickets are not good on the company's bus lines.

Success was prophesied for the venture when on July 4 there was a traffic block of automobiles for 13 miles on the Newburyport Turnpike. In Revere and other places there were traffic jams. On the second Sunday, July 17, some 600 tickets were sold out of Lowell alone.

To cater to this new service the company has added 100 new de luxe cars with all modern conveniences to its rolling stock.

Safety Provisions in Cincinnati

Passengers on electric railways in Cincinnati, Ohio, are afforded additional protection by an amendment to the city's traffic ordinance made effective on Aug. 19. Under the new rule drivers must stop their vehicles and remain at least 6 ft. behind any street car that has come to rest either to receive or to discharge passengers. These passengers must be permitted free passage to the curb. The vehicles must not be started until the street car is again in motion. Standing street cars can be passed, however, with caution at not more than 15 m.p.h., at safety zones or loading platforms. Further, the City Manager has been authorized "to adopt and install such traffic control devices, signs and safety platforms for the controlling, regulating, directing and moving traffic and for designating any shopping zone, berthing zone, parking space, taxicab stand, bus stop, or any other place or stand upon the streets of the city as interest and convenience of the public may require."

Two Railway Lines in Providence Combined

The Providence-Woonsocket and Providence-Buttonwoods lines will be combined under a new plan to be put into effect on Aug. 28. This announcement was made recently at the offices of the United Electric Railways, Providence, R. I.

The same half-hourly service which has been in effect on both lines will be continued, the only change being that the Woonsocket cars and crews will run through the center of the city to Buttonwoods. The arrangement, it was explained, will not affect the so-called "rush hour" service on either of the lines, extra cars being put on both divisions for heavy traffic.

Consolidation of the two lines has been under consideration for some time, railway officials said, it being the opinion of experts that the two lines, both operating under the block signal system and both being interurban services, should be combined. All cars on the Woonsocket division have recently been completely renovated, officials said, and the new arrangement will afford residents along the Buttonwoods line the better rolling stock instead of the older cars now in service on that division.

Commission Will Not Interfere in Buffalo

The Public Service Commission has denied the petition of the International Railway, Buffalo, N. Y., for a reopening and abrogation of the commission's order of Dec. 23, 1925, directing the reconstruction of tracks in Grant Street and Walden Avenue. The company alleged in its petition that the action by the Buffalo City Council in assuming to annul certain franchises given it made the track reconstruction work inadvisable. In a memorandum, the commission held that the relief asked for was unneceessary as the city had been restrained from taking any further proceedings in the matter. The commission says it does not propose to interfere with the discretion of the city authorities as to the priority in which track reconstruction is necessary.

Free Rides in Kansas City Introduces New Cars

The Kansas City Public Service Company, following a general plan of "educating the public" to its improvement program, has been using its new de luxe cars for a short period on the various lines of the city. On the Argentine-Twelfth Street line they charged no fares for certain periods during the first two days during which the de luxe cars were functioning.

Special considerations granted to the Argentine line were due to the dissatisfaction with the railway service which has been apparent with commuters on that line in the past. On Aug. 7 the 45 modernized street cars, which had been operating on the Country Club line since July 3, were transferred. The company through the newspapers invited every one to ride these cars as its guests between the hours of 10 a.m. and 2 p.m. On the next day, Monday, free fares extended from 10 a.m. to 2 p.m. and from 7 p.m. to 10 p.m. Transfers to other lines were accepted.

The Kansas City Public Service Company will continue to shift the 45 cars from one line to another for a short period until the entire area of the two Kansas cities has been covered.

Pass Included in Oakland's Modified Fare Petition

Officials of East Bay cities are preparing to oppose the request of the Key System Transit Company for an increase in rates. The company's request for a 10-cent street railway fare and a 25-cent ferry fare to replace the present 7 and 21-cent rates has been modified by a proposal to introduce the weekly pass.

According to the Key System plan, evolved after a thorough study by Richard Sachse, noted engineer, weekly passes would be sold to the public for $1, good for an indefinite number of rides within the city's 7-cent zone and transferrable to any member of the purchaser's family. In zones outside the city limits the weekly pass rate would be $1.50. Monthly passes good for unlimited rides on cars and ferries would cost $10.

Key officials estimate the gross revenue increase under the new plan as $893,503 for the first year. Deducting state and local franchise taxes on this increased earning, the net gain would be approximately $844,360. Of this amount $517,123 would be paid by railway patrons and $376,360 by ferry patrons. If these figures should prove correct, they would yield the company a return of 4½ per cent on its investment.

The engineer, in order to promote the adoption of the pass system and secure as many pass users as possible, urges that the Key System be permitted to allow a 3 per cent commission to employees for selling the passes. These commissions, it is estimated by Mr. Sachse, would total about $100,000 the first year. Mr. Sachse, in advocating the new plan, said:

> This departure would be in keeping with the new program of transit companies in "selling transportation." It is believed that the weekly pass presents many possibilities for co-operation between the merchants and commercial institutions of the city and the transportation companies, bringing about a large use and wide distribution.

Commissioner Clyde Seavey continued the hearing until Sept. 16.

The rate hearing has been going on intermittently for more that a year and a half. In 1925 the Key System was granted a temporary raise in rates after carmen of the company had been awarded higher wages by an arbitration committee and after the company had complained that the old rates were inadequate.

Up to the time that Mr. Sachse made the new fare raise proposal most of the testimony had dealt with valuation data based on surveys. Experts of the company and the Railroad Commission disagree about the company's rate base. The company's figures are nearly $4,000,000 higher than those of the experts of the commission.

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Washington Office Changes Headquarters

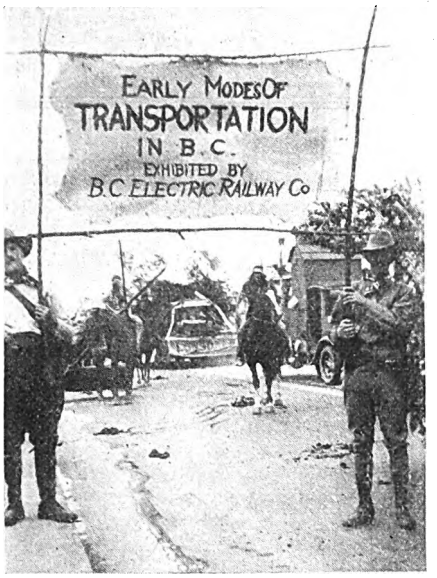
The Washington, D. C., office of the McGraw-Hill Publishing Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, was removed on Aug. 25 to the new National Press Building.

Railway Commemorates Dominion Day with Inspiring Exhibit

If—a momentous one—H. R. H. the Prince of Wales had embarked on Canadian soil a few weeks sooner than he did he might have abandoned summarily his quest for big game in the happier possession of a smiling squaw. And willingly would she have relinquished "big red man" of unrelenting countenance for a paler idol from across the seas amenable to her progressive ideals. But—again momentous—the *Empress of Australia* docked some three weeks late and the management of the British Columbia Electric Railway, who loaned the Indian maiden in honor of Dominion Day, can continue in the safer if less romantic business of selling transportation and remain content in the knowledge that its contribution to the Diamond Jubilee of Confederation had even more far-reaching effects.

In the winter months that are to come Vancouverites can talk about the difficulties their forebears experienced in traveling about, for they were spectators at the parade in Vancouver on July 1 when the British Columbia Electric Railway gave an exhibit of the early modes of transportation in that province. Here were romance and history—another chapter for an addition to Hilaire Belloc's "The Highway and Its Vehicles."

The men and women who took part were all dressed in the costumes of the periods and with three exceptions were in the employ of the railway. First came two men carrying a sign made in the shape of a rawhide explaining the nature of the railway's part in the parade. Then followed an Indian, squaw and dog, the dog dragging a travois, which is a pair of crossed sticks, used in the days before wheels. The next unit was an Indian mounted, followed by a squaw with a travois on the horse. Later came a white man dressed as a prospector, followed by a packhorse. Another unit was a Red River car, and finally a stage coach. If this historic pageant accomplished nothing more than the dissemination of information on transportation in the Province of British Columbia it might be considered an achievement, but one is inclined to think it was also morally stimulating and inspiring.



A sign separates the past and present

Niagara Falls-Buffalo-Lockport Round Trip Fare 25 Cents

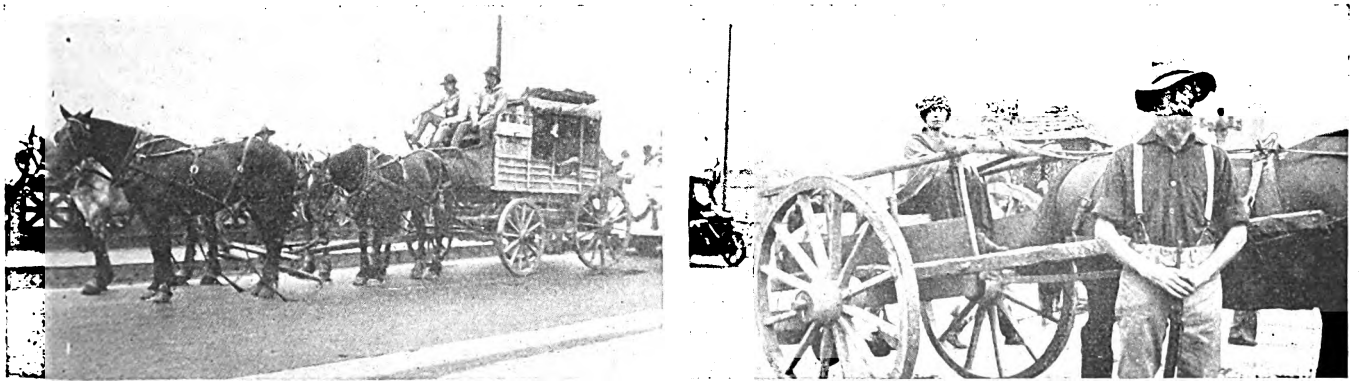
The Public Service Commission on Aug. 23 directed the International Railway, Buffalo, N. Y., effective Sept. 1, to establish a round-trip ticket fare of 25 cents applicable to its Niagara Falls High-Speed and Buffalo-Lockport lines between Buffalo and Englewood stop, each ticket to have similar privileges as now given under the one-way cash fare. The company is also directed to place the tickets on sale at convenient places in Buffalo and at the Englewood stop. The existing fare has been in effect since March 1.

Complaint was made by about 35 residents of the Englewood section, who asked for a reduction in the fare rate in accordance with the terms of a franchise by the Tonawanda Town Board on Sept. 30, 1915. They claimed this franchise was inviolable as to all its terms. The commission, in a memorandum, held that such is not the case, as the Court of Appeals has squarely held that all franchises granted by a municipal authority subsequent to the passage of the public service commission law are subject to regulation under that act.

The complaint also alleged discrimination, it being claimed that Buffalo and Amherst residents who use the Main Street line are enjoying a city fare, while those who ride to Englewood are required to pay more. The commission's memorandum said that although a commutation ticket book good for one round trip daily in the month was sold for $5 and placed commuters on practically a city fare basis, it did not take care of the less habitual rider and the members of his family.

Omaha Franchise Hearings On

Hearings were held on Aug. 1 and again on Aug. 8 on the proposed railway franchise for the Omaha & Council Bluffs Street Railway, Omaha, Neb. The company has stated that it would put its comments and suggestions as to changes and modifications in writing and furnish a copy to each of the Councilmen as well as to the City Corporation Counsel. The meetings are to be continued. The Omaha franchise draft was referred to in detail in the ELECTRIC RAILWAY JOURNAL, issue of July 30, page 206.



Transportation methods of yesteryear in British Columbia

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Recent Bus Developments

Double-Deck Buses for Rush Hours in Buffalo

Double-deck, gas-driven buses have been relegated by the International Bus Corporation, a subsidiary of the International Railway, in Buffalo to use during the peak rush hours in the morning and late afternoon. In this place the International Bus Corporation has substituted single-deck gas-electric buses seating 33 passengers. Because of the smaller carrying capacity of the new buses, the company has increased the frequency of the service 20 per cent. Bernard J. Yungbluth, president of the bus and railway companies, explained in a statement addressed to Mayor Schwab:

It is with a great deal of pleasure that I read your constructive and friendly suggestion that I.R.C. serve the Delaware Avenue route with single-deck pneumatic-tired buses such as were used in the Peace Bridge service. I.R.C., gladly co-operating with you, began as soon as your letter was received preparations for the use of single-deck, city type, gas-electric buses on Delaware Avenue. It is my earnest wish that the spirit of good will revealed by your kind letter may develop into full mutual understanding and hearty co-operation for the future improvement of Buffalo's transit service.

Service by Bus Expanded in Norfolk

The third great step in putting into effect in Norfolk, Va., the bus and street car rerouting plan of last December was taken by the Virginia Electric & Power Company on Aug. 21, when buses supplanted street car lines aggregating 11 miles in length.

Buses for New York Suburban Service Approved

The Public Service Commission of New York on Aug. 23 authorized the New York & Stamford Railway to substitute buses for trolley cars on its main line between the intersection of Dean Place and the Boston Post Road in Larchmont and the state line at Byram River, passing over various streets and highways in Larchmont, Mamaroneck, Rye, Port Chester and the towns of Mamaroneck and Harrison, under consents to the substitution, as required by Section 50-A public service commission law, granted by the municipalities.

A new zoning arrangement under which the zones are reduced and the zone fare increased from 7 to 10 cents is provided in the change from trolley cars to buses.

Commissioner Van Namee, in a memorandum, states that in 1926 trolley line fares decreased more than 2,000,000, representing a decrease of between 25 and 30 per cent in revenue, and in the first six months in 1927 there was a further decrease in revenue of from 10 to 15 per cent. Paving obligations in prospect during the next eighteen months will reach between $100,000 and $150,000.

The commissioner stated that there was a general demand for the use of buses except in Mamaroneck, where a sentiment for trolley lines remained, but at a public meeting bus operation was favored without a dissent.

The evidence further showed that since substitution of bus operation between Port Chester and Stamford there had been an increase of from 25 to 30 per cent in riders and an increased service.

Dallas-Fort Worth Lines Merge

Merging of all the bus lines now operating between Fort Worth and Dallas, 32 miles, and their transfer to a new company to be organized as a subsidiary of the Northern Texas Traction Company has been authorized by the State Railroad Commission. The transaction is the outcome of a compromise reached among the Northern Texas Traction Company, the West Texas Coaches and the Red Ball Bus Company. The Northern Texas Traction Company owns the interurban electric railway between Fort Worth and Dallas, and when the Red Ball Bus Company applied recently to the Railroad Commission for a permanent permit to operate buses between Fort Worth and Dallas, the Northern Texas Traction Company and the West Texas Coaches protested.

Robert K. Hanger, Fort Worth, attorney for the Northern Texas Traction Company, said:

The purpose in carrying on the negotiations which have resulted in the acquisition of the permits to operate buses between Fort Worth and Dallas is to institute bus service as good as the best, in order that the people of the two cities, as well as those living along the route, may enjoy the advantages and conveniences sought to be vouchsafed to them by the provisions of the bill enacted by the last Legislature. To do this, a company with adequate capital will be organized; commodious, comfortable buses will be purchased and put in service, and station and terminal facilities in keeping with the high standards and purpose of the company will be provided.

Another Route Sought by Boston & Maine

The Boston & Maine Railroad has petitioned the Public Utilities Department in Massachusetts for permission to operate buses between Cambridge and Fitchburg, Mass. This would not interfere with any lines operated by the Eastern Massachusetts Street Railway, but the new line would compete in part with the Lovell buses, which run from Arlington to Concord. As a general rule the people in Fitchburg desire this bus line to be established by the Boston & Maine. Its establishment, however, is somewhat contrary to the policy of the department to allow no paralleling of the railroad. The matter is now under consideration by the state authorities.

Right of Buses to Operate in Oklahoma City Defined

Buses of the People's Transit Company cannot operate within two blocks of an electric railway line, the Appellate Court at St. Louis ruled recently, thus sustaining the city ordinance of Oklahoma City, by prohibiting bus operation adjacent to and paralleling the electric railway lines.

The People's Transit Company, an independent corporation, established a bus transportation system, operating on the same streets as railway lines. This was not in compliance with Ordinance No. 2,987 passed by the City Council of Oklahoma City on Feb. 9, 1926, which states that "No bus routes may parallel an existing street car line nearer than the third street."

A complaint was filed March 25, 1926, by the receivers of the Oklahoma Railway, Oklahoma City. The receivers in conducting the street cars and operating buses as a part of the general transportation system within the city were complying with all city ordinances. The bill alleged that the People's Transit Company was not complying with city Ordinance No. 2,987 in its bus operation, and that such operation was causing serious loss in revenue to the receivers.

A temporary injunction was granted by the District Court of the United States restraining the People's Transit Company from operating buses in violation of Ordinance No. 2,987 and the bus company appealed the decision of the lower court to the United States District Court of Appeals at St. Louis, maintaining that the Act of 1925 of the State of Oklahoma, permitting railway systems to operate buses, was invalid because discriminatory; that Ordinance No. 2,987 was invalid as enforced; that the appellees had no property right affected entitling them to injunctive relief, and that the appellees had not compiled with the ordinance in the operation of their buses.

In affirming the decision of the lower court, the Appellate Court made the following pronouncements:

1. That the Act of 1927, though favoring the railways, contained provisions that were "reasonable" and therefore not illegal.
2. That the existing railway system was furnishing adequate transportation facilities and that the system was permanent, whereas the bus company might disappear over night.
3. That no new system has a legal right to destroy such an existing system and have the public at its mercy.
4. That no bus line may parallel an existing street car line nearer than the third street.

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5. That buses of the street railway system must operate in compliance with Ordinance No. 2,987.

6. That the appellees have such property interests as to justify equitable relief and that the appellees have come to equity with clean hands.

Bus Men Attack Ordinance

The validity of a city ordinance in Terre Haute, Ind., prohibiting buses taking on or discharging passengers on streets occupied by car lines was attacked in a petition filed with the Indiana Public Service Commission on Aug. 18 by Joseph H. Gregg and Andrew Carli, operators of the Blue & Gray bus line and the Hoosier Transportation Company. The petition asks the commission to declare the ordinance invalid. It is contended the ordinance is in conflict with the state law. The former company operates between Harmony and Terre Haute, and the latter between Indianapolis and Terre Haute.

First Report on Minnesota Operation

The Minnesota Railroad and Warehouse Commission in its annual report notes the fact that bus transportation really originated in Minnesota on the Messaba Iron Range back in 1913. The service was started with two sedan type cars run over well built highways. In 1925 41 modern buses were in regular service by the company over this route.

The Twin City Motor Bus Company, subsidiary of the Twin City Rapid Transit Company, is second only to the Northland Transportation Company, subsidiary of the Great Northern Railway, in the operation of buses in the state. This company has 102 buses covering 114.7 miles in interurban and suburban business. The Northland company has 133 buses, with seating capacity of 2,325 passengers, traveling 2,393 miles of routes.

Motor transportation companies carried 12,002,648 passengers in 1926, returning a revenue of $4,626,519. Seating capacity was 9,440 passengers. Buses traveled 17,327,736 miles over 4,870 miles of routes. Of 402 buses in operation 283 did no local business. These buses paid $218,660 in license tax to the state and a $63,904 gasoline tax at 2 cents a gallon.

Buses of the Twin City Motor Bus Company traveled 4,997,740 miles, carrying 5,114,834 passengers at a total revenue of $1,204,851. The company paid $52,473 vehicle tax and $17,164 gasoline tax.

The Northland, which does only a through and suburban bus business, in 1926 carried 1,975,024 passengers, 7,391,658 bus-miles returning a revenue of $1.981.628. The company paid the state $99,170.51 vehicle tax and $27,288 gasoline tax.

Buses in Minnesota were placed under jurisdiction of the commission under the transportation act of 1925. In consequence this is the first report of real import on this phase of the commission's work.

Local Operation Planned in Seaside Resorts

The Coast Cities Railway, operating through South Belmar, Spring Lake, Sea Girt, Manasquan and Long Branch, recently applied to the officials of Spring Lake and Sea Girt for permission to discontinue railway service and substitute buses. It is the plan of the company to operate buses locally in the two boroughs only.

Bus Expansion for Louisville in Franchise Draft

A tentative draft of a bus franchise ordinance has been submitted to Mayor J. T. O'Neal, Louisville, Ky., by the Louisville Railway. This ordinance calls for the establishment of nine lines covering suburban territory, with several of the lines looping in the downton section. The franchise will be for twenty years, with a fare rate within the city limits not to exceed 10 cents per passenger, with transfers between bus lines. In the event the franchise is secured by the railway, transfers will be given from bus to rail, on the 10-cent fare basis. The purchaser of the franchise will put up a $100,000 bond to carry out the terms of this contract. An upset bid of $5,000 is provided as the minimum sale price of the franchise, which is to be sold at public auction.

Railway Seeks More Westchester Routes

The Westchester Street Transportation Company, Inc., and the Eastchester Transportation Corporation on Aug. 18 petitioned the Public Service Commision for permission to operate bus line from White Plains to Mount Kisco, Westchester County, and for revocation of the certificate granted to John Fabia for bus operation over practically the same route. The petition alleges that on June 15, 1927, Fabia stopped the operation of buses over the route authorized and that he has disappeared and his former associates are unable to give any information concerning his whereabouts, and that during his operation of the bus route there was continual difficulty between him and the petitioner because he violated the terms of his certificate, particularly on the Silver Lake line.

Buses Substituted on Two Lines in Binghamton

The Public Service Commission has approved the abandoment of the Binghamton Railway, Binghamton, N. Y., of its Rockbottom and Spring Forest lines. The commission has also granted to the Binghamton Railway Bus Lines, Inc., a certificate for the operation of a bus line in the territory formerly served by the street railway.

Muncie Case Again Deferred

After hearing the arguments on a plea in abatement brought by the independent bus operators in Muncie, Ind., and on a demurrer to the plea by the Union Traction Company of Indiana, in the latter's petition for an order restraining bus lines from operating in Muncie, Special Judge A. L. Bales of the Randolph County Circuit Court said he would make a ruling at the next term of court. The judge pointed out that it would take several weeks to scan the briefs and look up the law as cited.

The plea contained six paragraphs in which it denies the jurisdiction of the Indiana Public Service Commission over the streets of Muncie, contending that the City Council holds this right.

The Union Traction is charged with operating buses illegally, because it has failed to comply with the terms of an ordinance adopted by the City Council in 1925. It is also charged that Arthur Brady, who, as receiver for the traction company, brought the action for a restraining order and damages, is not legally capable of so doing.

Camden Line Started

The Public Service Transportation Company, subsidiary of the Public Service Railway, started a bus line between National Park and Federal Street Ferry, Camden, on Aug. 15. Half hourly trips are made and the buses pass through Verga, Westville, Brooklawn and Gloucester. The fare is 15 cents each way. The service was installed at the solicitation of residents of National Park and Verga.

Pneumatic Tires Ordered in Minnesota

On the theory that pneumatic tires are less wearing on state highways than solid tires the Minnesota Railroad and Warehouse Commission has directed that all motor vehicles, including buses, must employ pneumatic tires. This order is an amendment to General Order No. 1 of June 25, 1925.

BUSES IN OTTAWA, ILL.—The Illinois Power & Light Company has been authorized by the Illinois Commerce Commission to abandon its railway service in Ottawa, Ill., and substitute bus lines. Tracks in the city, except those used by the Streator-Ottawa branch of the Illinois Traction System, will be removed within 90 days.

BUS FARE ADVANCED.—The Public Service Commission issued an order on Aug. 4 allowing the Capitol District Transportation Company, Inc., Albany, N. Y., a subsidiary of the United Traction Company, to file a new tariff on one day's notice increasing its fares from 7 cents to 10 cents with the sale of thirteen tokens for $1. This would make the rate the same as that of the parent company, which was recently granted a similar increase.

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Financial *and* Corporate

Another Crisis Confronts Seattle Municipal Railway

With interest payments aggregating $289,010 due in New York City on Sept. 1, the Seattle Municipal Railway, Seattle, Wash., faces another of its semi-annual financial "crises." This time, it has become known, the railway will not be forced to go on a warrant basis in order to raise the half year's interest on the $15,000,000 of purchase bonds. In the city treasury, to the credit of the railway, lies the sum of $250,000, part of a $600,000 loan which was made last winter from the city's light funds to tide the railway over a financial emergency. This sum will be used to meet the major portion of the interest due. The City Council has by ordinance repaid $350,000 of the loan from the railway earnings. By this recourse the railway will be tided over the present situation, but the repayment will add strain to the railway early next year, when a large principal and interest payment becomes due.

Omaha Bridge Company Refinances

The Omaha & Council Bluffs Street Railway & Bridge Company, which owns the structure over the Missouri River connecting Omaha, Neb., and Council Bluffs, Iowa, served by the electric cars, announces that it has refunded the $2,000,000 5 per cent bond issue falling due on Jan. 1, next, with an issue of a similar amount of 6 per cent bonds due in 20 years. Their payment is guaranteed by the Omaha & Council Bluffs Street Railway.

As indicated previously in the ELECTRIC RAILWAY JOURNAL the $5,000,000 bond issue of the Omaha & Council Bluffs Street Railway also falls due next January, and an effort to secure a three-year extension on it has been made. In the meantime a protective committee of bondholders is circularizing all other holders asking that they deposit bonds with the Omaha National Bank under an agreement whereby the latter would be extended for that period at 6 per cent. The bonds now bear 5 per cent. This is for the purpose of giving the company a chance to make an advantageous renewal of its franchise.

Attorneys for the company and for the city are still sparring over the contents of the latter's draft of a new franchise ordinance, while several councilmen say they will not treat with the company unless the Guaranty Trust Company, trustee for the bondholders, abandons its claim in federal court that the present franchise is in perpetuity. City Attorney Van Dusen says he will discuss provisions the company contends are objectionable, if it will state what these are, but insists that the franchise restricts the company to the use of street cars and gasoline buses.

Heavy Expenses on Boston Elevated

$482,749 excess of cost of service over receipts. Number of revenue passengers on increase. Bus business grows. Old cars replaced. Reconstruction projects carried out

THE public trustees of the Boston Elevated Railway, Boston, Mass., have submitted their eighth annual report.

The eighth full year of public operation closed on June 30, 1926, with a balance of receipts over cost of service of $22,304. This amount was repaid to the Commonwealth and distributed to the cities and towns that are served by the railway.

The calendar year of 1926 shows an excess of cost of service over receipts of $482,749. In 1925 there was a balance of $502,193. Total revenue from transportation was $34,415,308 in 1926 and $33,833,186 in 1925. Total railway operating expenses increased from $24,405,735 in 1925 to $26,076,268 for the 1926 period. The number of revenue passengers was 371,218,401 against 365,036,286 in 1925.

The cumulative effect of the wage increases since July 1, 1923, beginning with the Mayberry award of that year, has been a heavy burden. A considerable number of employees are members of the so-called building trades crafts whose wages in general in this locality are fixed by agreement with the Building Trades Employers Association, and these wages during the past year reached the highest point they have ever attained. The total payroll cost for the year has been no higher than appears in the following statements only by reason of a

INCOME STATEMENT OF THE BOSTON ELEVATED RAILWAY

Operating Income	Twelve Months Ended Dec. 31, 1926	Twelve Months Ended Dec. 31, 1925	Twelve Months Ended Dec. 31, 1924
Passenger car revenue	$32,812,766	$32,906,220	$33,072,029
Passenger motor bus revenue	1,548,592	853,706	331,223
Special car revenue	32,594	30,514	15,919
Mail revenue	175	176	228
Express revenue	18,329	38,205	44,223
Miscellaneous transportation revenue	2,850	4,363	4,532
Total revenue from transportation	$34,415,308	$33,833,186	$33,468,157
Station and car privileges	$655,285	$338,345	$331,842
Rent of tracks and facilities	82,488	55,868	32,101
Rent of equipment	3,903	3,823	6,833
Rent of buildings and other property	82,486	94,518	101,277
Power	102,537	78,092	88,157
Miscellaneous	29,319	28,462	17,212
Total revenue from other railway operations	$956,020	$599,110	$577,424
Total railway operating revenues	$35,371,329	$34,432,297	$34,045,581
Railway operating expenses:			
Way and structures	4,222,526	3,766,615	3,823,124
Equipment	4,423,585	3,900,956	4,156,222
Power	2,641,775	2,536,129	2,819,283
Conducting transportation	11,924,517	11,567,233	11,825,235
Traffic	6,139	3,239	7,866
General and miscellaneous	2,873,978	2,656,275	2,611,292
Transportation for investment	*16,254	*24,713	*20,889
Total railway operating expenses	$26,076,268	$24,405,735	$25,222,133
Per cent of operating expenses to operating revenues	73	70	74
Per cent of operating expenses to operating and non-operating income	73.4	70.6	73.8
Net revenue, railway operations	$9,295,061	$10,026,562	$8,823,448
Taxes assignable to railway operations	$1,910,764	$1,652,517	$1,623,995
Operating income	$7,384,296	$8,374,044	$7,199,452

*Credit.

Non-Operating Income	Twelve Months Ended Dec. 31, 1926	Twelve Months Ended Dec. 31, 1925	Twelve Months Ended Dec. 31, 1924
Income from lease of road	40	50	393
Net income from miscellaneous physical property	.....	486	.....
Dividend income	1	3	3
Income from funded securities	10,298	11,286	19,147
Income from unfunded securities and accounts	36,806	39,583	43,316
Income from sinking fund and other reserves	33,280	33,280	33,280
Release of premiums on funded debt	28,413	28,413	28,737
Miscellaneous income	1,142	1,977	4,912
Total non-operating income	$109,983	$115,081	$129,791
Gross income	$7,494,280	$8,489,126	$7,329,243
Deductions from Gross Income			
Rent for leased roads:			
Boston Elevated Railway—Dividend rental	3,112,605	3,119,532	3,127,015
Other roads	49,848	49,916	48,551
Total rent for leased roads	$3,162,454	$3,169,448	$3,175,566
Miscellaneous rents	2,217,000	2,217,470	2,125,593
Net loss on miscellaneous physical property	3,779	.....	53
Interest on funded debt	2,422,935	2,422,935	2,430,788
Interest on unfunded debt	112,569	117,974	172,102
Amortization of discount on funded debt	40,595	40,595	43,365
Miscellaneous debits	17,695	18,509	18,469
Total deductions from gross income	$7,977,029	$7,986,932	$7,965,93
Balance after cost of service	**$482,749	$502,193	**$636,696

* *Debit.

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STATEMENT OF REVENUE PASSENGERS CARRIED BY BOSTON ELEVATED RAILWAY

Year Ended	5-Cent Fares	6-Cent Fares	7-Cent Fares	8-Cent Fares	10-Cent Fares	Pupils' Tickets 5 Cents	Special Car Special Bus Passengers (*See Note*)	Total Revenue Passengers	Per Cent Yearly Increase*
1918	217,203,899	.....	102,619,954	28,739,858	.....	.....	100,989	348,664,700	*8.49*
1919	886,034	.....	.....	173,808,769	146,162,131	3,803,815	97,936	324,758,685	*6.86*
1920	3,846,989	.....	.....	.....	326,496,184	5,105,588	77,800	335,526,561	3.32
1921	23,915,742	.....	.....	.....	307,624,243	5,606,105	105,990	337,252,080	0.51
1922	71,425,347	.....	.....	.....	279,851,313	5,213,664	103,618	356,593,942	5.73
1923	94,170,518	.....	.....	.....	283,660,762	4,214,132	104,285	382,149,697	7.17
1924	85,218,867	9,549,775	.....	.....	283,569,003	4,443,228	107,975	382,888,848	0.19
1925	3,853,807	55,937,785	.....	.....	299,107,782	6,003,917	132,995	365,036,286	*4.66*‡
1926	1,936,219	58,803,057	.....	.....	304,378,164	5,971,189	129,772	371,218,401	1.69

*Increase for nine months.

5-cent fare previous to Aug. 1, 1918.
7-cent fare Aug. 1, 1918.
8-cent fare Dec. 1, 1918.
Pupils' tickets (5 cents) Jan. 1, 1919.
10-cent fare July 10, 1919.
First 5-cent fare line (without transfer) Aug. 23, 1919.
First 5-cent local fare line March 26, 1921.
6-cent local fare Nov. 5, 1924.

Note—Previous to 1908 special car passengers included with 5-cent fare.

‡During the years 1922, 1923 and 1924, one passenger making a single journey for which he might pay two 5-cent fares was counted as two revenue passengers. The substitution in November, 1924, of 6-cent tickets for 5-cent cash fares has often resulted in the payment of a 10-cent fare by such a possenger with a consequent reduction in the company's figures of total revenue passengers carried though the gross passenger revenue for the year 1925, which increased $371,269.51, would indicate substantially the same number of passengers carried by the railway in 1925 and 1924.

Italics denote decreases.

PASSENGER CARS OWNED

	1926	1925
Total surface passenger cars	1,627	1,649
Total rapid transit passenger cars	468	468
Total surface and rapid transit cars	2,095	2,117
PASSENGER BUSES OWNED		
25-passenger buses	109	66
29-passenger buses	40	3
61-passenger buses	1	.....
Total buses	*150	†69
Total passenger cars and buses owned	2,245	2,186

*In addition, the Boston Elevated Railway was, on Dec. 31, 1926, operating 80 leased buses.

†In addition, the Boston Elevated Railway was, on Dec. 31, 1925, operating 80 leased buses.

NOTE—60 Cambridge-Dorchester Tunnel cars are on order. One hundred elevated cars are on order.

ALLOCATION OF COST OF SERVICE PER PASSENGER, BOSTON ELEVATED RAILWAY

Twelve months ended Dec. 31, 1926

	Cents
Average receipts per revenue passenger	9.558
Cost of service per revenue passenger:	
Interest on bonds and notes	0.683
Rent of subways and tunnels	0.597
Rent of leased roads	0.852
Coal	0.310
Depreciation	0.765
Damages	0.249
Materials and other items	0.950
Taxes	0.515
Labor	4.767
	9.688

STATEMENT OF RESERVE FUND OF BOSTON ELEVATED RAILWAY ON DEC. 31, 1926

Balance Jan. 1, 1926		$637,799
Excess of cost of service over receipts		
February	$185,989	
June	1,662	
July	393,028	
August	451,546	
September	236,543	
	$1,268,770	
Excess of receipts over cost of service		
January	$223,301	
March	161,772	
April	77,031	
May	57,010	
October	2,723	
November	29,302	
December	234,879	
	$786,021	
Excess for the year of cost of service over receipts		$482,749
		$155,050
Amount refunded to Commonwealth of Massachusetts, July 1, 1926		22,304
		$132,746
Profit and loss items, Cr		28,594
Balance—Dec. 31, 1926		$161,340

COMPARATIVE PASSENGER STATISTICS OF BOSTON ELEVATED RAILWAY — REVENUE PASSENGERS CARRIED

Year	Week Day Average	Saturday Average	Sunday Average	Holiday Average	Total for Year
1926	1,086,544	1,191,342	576,701	666,258	371,218,401
1925	1,066,317	1,172,871	577,200	600,007	*365,036,286
1924	1,109,861	1,216,132	630,755	727,191	*382,888,848
1923	1,109,274	1,196,301	652,404	758,915	*382,149,697
1922	1,030,303	1,144,320	617,148	691,890	*356,593,942
1921	975,745	1,068,295	578,860	696,691	337,252,080
1920	960,737	1,072,319	591,063	703,634	335,526,561
1919	934,918	1,078,635	596,182	706,429	324,758,685
1918	985,384	1,147,809	658,902	775,634	348,664,700
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1915	992,283	1,140,046	685,726	846,860	352,469,586

*Note—During the years 1922, 1923 and 1924, one passenger making a single journey for which he might pay two 5-cent fares was counted as two revenue passengers. The substitution in November, 1924, of 6-cent tickets for 5-cent cash fares has often resulted in the payment of a 10-cent fare by such a passenger with a consequent reduction in the company's figure of total revenue passengers carried, though the gross passenger revenue for the year 1925, which increased $371,269, would indicate substantially the same number of passengers carried by the railway in 1925 and 1924.

TRAFFIC STATISTICS OF BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31

	1926	1925	1924	1923
Round trips operated	7,526,260	7,185,587	6,994,749	6,488,082
Passenger revenue	$34,393,953	$33,790,441	$33,419,172	$33,297,951
Passenger revenue per car-mile (cents)	59.41	60.93	59.69	61.61
Passenger revenue per car-hour	$5.75	$5.86	$5.67	$5.71
Passenger revenue mileage	†57,895,881	†55,461,094	†55,988,679	† 54,049,665
Passenger revenue car-hours	5,980,267	5,767,957	5,894,115	5,826,993
Revenue passengers carried	371,218,401	365,036,286	382,888,848	382,149,697
Revenue passengers carried per car-mile	6.412	6.582	6.838	7.070
Revenue passengers carried per car-hour	62.07	63.28	64.96	65.58

† Including bus mileage, 1923, 465,382; 1924, 890,901; 1925, 2,472,456; 1926, 4,717,900.

COMPARATIVE POWER STATISTICS OF THE BOSTON ELEVATED RAILWAY

	1926	1925	1924	1923	1922	1921	1920
Tons of coal burned	230,759	217,414	240,493	260,032	273,441	215,870	258,087
Pounds of coal per kilowatt-hour	2.011	1.973	2.068	2.264	2.553	2.174	2.353
Average price of coal per ton	$4.98	$5.22	$5.921	$7.085	$6.777	$7.71	$10.07
Net cost of power for car service per kilowatt-hour (cents)	0.982	1.021	1.093	1.227	1.414	1.172	1.921
Net cost of power per total revenue car-mile (cents)	4.401	4.428	4.833	5.468	6.153	4.815	8.538
Direct current annual output (kilowatts)	257,045,625	246,835,300	260,401,225	257,270,357	239,905,874	222,461,060	245,676,503
Direct current maximum hour output (kilowatts)	85,900	85,660	86,245	82,965	78,755	75,905	72,295

ALLOCATION OF ASSESSMENTS ON CITIES AND TOWNS OF BOSTON ELEVATED RAILWAY

History of the 1919 Loan Assessment on Cities and Towns (Chapter 159, Special Acts 1918)

Cities and Towns	Original Assessments	Total Repayments	Balance Due
Boston	$2,863,042	$1,193,117	$1,669,924
Cambridge	386,397	161,023	225,373
Somerville	167,090	69,631	97,459
Brookline	101,621	42,348	59,272
Medford	81,449	33,942	47,506
Malden	76,112	31,718	44,393
Everett	74,727	31,140	43,586
Watertown	56,155	23,402	32,753
Arlington	44,267	18,447	25,819
Chelsea	40,426	16,846	23,579
Newton	37,079	15,452	21,626
Belmont	25,552	10,649	14,903
*Commonwealth of Massachusetts	26,229	26,229	.....
†Commonwealth of Massachusetts	.....	690	**690
	$3,980,151	$1,674,640	$2,305,511

Based on traffic counts made July 24, 25, 26, 27, 1919, in accordance with the provisions of Section 14, Chapter 159, Special Acts 1918.

*Assessment of Quincy and Stoneham assumed by Commonwealth of Massachusetts.

†Expense to Commonwealth of Massachusetts for financing loan (to be assessed to cities and towns pro rata to their original contributions).

REPAYMENTS

July, 1922	$517,196
July, 1923	1,114,557
July, 1925	20,581
July, 1926	22,304
Total repayments	$1,674,640

**Credit.

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COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES OF THE BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31

	1926	1925	1924	1923	1922
Total receipts	$35,481,313	$34,547,379	$34,175,319	$34,096,813	$32,699,176
Operating expenses:					
Wages	17,697,377	16,931,549	17,358,670	16,224,275	14,772,340
Material and other items	3,462,091	3,175,981	3,203,378	3,236,805	2,903,650
Injuries and damages (Excluding wages charged to this account)	925,918	666,488	740,025	822,775	555,355
Depreciation	2,841,721	2,496,000	2,496,000	2,004,000	2,004,000
Fuel	1,149,159	1,135,715	1,424,058	1,842,396	1,853,111
Total operating expenses	$26,076,268	$24,405,735	$25,222,133	$24,130,253	$22,088,458
Taxes	1,910,764	1,652,517	1,623,995	1,688,139	1,587,186
Rent of leased roads (including dividend rental under chapter 159, Acts of 1918)	3,162,454	3,169,448	3,175,566	3,185,577	3,646,595
	2,217,000	2,217,470	2,125,593	2,026,936	2,008,414
Subway and tunnel rents					
Interest on bonds and notes	2,535,504	2,540,909	2,602,891	2,316,026	1,891,315
Miscellaneous items	62,069	59,104	61,835	70,247	65,016
Total cost of service	$35,964,062	$34,045,185	$34,812,016	$33,417,181	$31,286,987
Loss for year	$482,749	.....	$636,696	.....	.....
Gain for year	.....	$502,193	.....	$679,631	$1,412,189

Profit and loss items not included in above.

substantial reduction in the number of men employed, and the careful exercise of operating economies.

The year 1926 was conspicuous for the extraordinary amount of snow expense, which totaled $484,165 and was the second largest of any year in the history of the railway. Heavy snowstorms occurred in the month of December as well as the early months of the year. These additional expenses appear in the total expenditures under the items of Maintenance, Power, and Accidents, but are impossible of segregation.

While there has been a reduction in some types of accidents, vehicle collisions have increased and there has been an increase in total expense for injuries and damages of $261,000 over the preceding year.

The annual charge for depreciation is $346,000 more than for the previous year due to increase in investment in depreciable property. By far the greater portion of this increase of $346,000 arises from the expansion of bus service and consequent increase in number of buses owned.

Added revenue arising from a greater number of passengers carried and from larger payments from advertising and station privilege contracts has offset some of these increased costs. Effort has been made during the year adequately to meet proper maintenance charges, which had been curtailed somewhat during the previous year.

There was a total increase of 6,182,115 in number of revenue passengers carried. The average traffic on week-days, Saturdays and holidays increased, whereas the Sunday traffic averaged slightly less.

To care for this increase and to provide more frequent trips where there has been increased substitution of one-man cars and buses, 2,385,255 more miles and 338,144 more round trips were operated. Two-man surface car operation was reduced from 24,880,686 miles to 23,653,994 miles, while one-man operation was increased from 13,271,296 miles to 14,419,209 miles and bus miles increased from 2,472,456 to 4,717,900. An increase of 268,122 miles was operated on the rapid transit lines.

Capital expenditures in 1926 totaled about $3,700,000. Contemplated capital expenditures for the year 1927 total approximately $4,000,000.

The depreciation charge during the year provided $2,841,721 toward capital expenditures. The balance was provided for by an increase of $300,000 in short time notes and by sales of real estate and other property, and reduction in amount of materials and supplies on hand.

No new capital obligations have been created in the year, but steps were taken to issue on Feb. 1, 1927, $1,926,000 additional bonds under the authority granted by chapter 288 of the acts of 1924. This amount is only slightly in excess of the cost of the 60 additional cars which have been ordered for the Dorchester rapid transit extension.

The net cost of power for car service per kilowatt-hour was 0.982 cent compared with 1.021 cents a year ago, due to increased efficiency of the new equipment and lower price of coal.

Replacement of the last wooden elevated cars, 100 in number, has been undertaken by an order for a similar number of modern steel cars. Eighty-one buses have been added during the year to cover the lines on which bus operation has been started. About 15 miles of track and special work were rebuilt and 2.6 miles extensively repaired.

Conspectus of Indexes for August, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Aug. 1927 **7.52**	July 1927 **7.52**	Aug. 1926 **7.36**	Aug. 1927 **7.52**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Aug. 1927 **142.1**	July 1927 **142.9**	Aug. 1926 **153.1**	Sept. 1920 **247.5**	Aug. 1927 **142.1**
Electric Railway Wages* 1913 = 100	Aug. 1927 **227.8**	July 1927 **227.8**	Aug. 1926 **225.9**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Aug. 1927 **200.9**	July 1927 **199.9**	Aug. 1926 **203.6**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Aug. 1927 **205.5**	July 1927 **203.7**	Aug. 1926 **208.3**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	July 1927 **144.6**	June 1927 **143.7**	July 1926 **150.7**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Aug. 1 1927 **12.58**	July 1 1927 **12.38**	Aug. 1 1926 **12.64**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	July 1927 **153.4**	June 1927 **158.5**	July 1926 **157.0**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	July 1927 **162.2**	June 1927 **164.8**	July 1926 **166.0**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	July 31 1927 **3.142**	June 30 1927 **3.053**	July 31 1926 **3.603**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	July 1927 **18.37**	June 1927 **19.15**	July 1926 **19.35**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number	July 1927 1503	June 1927 1689	July 1926 1656	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**37.90**	**46.98**	**89.76**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Receiver Ordered to Sell Massachusetts Line

The American Trust Company, Boston, Mass., has received notice of an order issued by the Superior Court to sell the property of the Boston & Worcester Street Railway, South Framingham, Mass.

The Superior Court has ordered a hearing in equity session to be held on Aug. 31. The sale date will be fixed shortly thereafter. One of the greatest handicaps in rehabilitating the lines has been the inability to gain authority to install service of a kind that would pay best under present conditions.

INTERBOROUGH REPORTS DEFICIT.—The gross revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., for July, 1927, was $4,883,900, representing an increase of $867,598 for a similar month the year previous. Expenditures for operating and maintaining the property were $3,248,569, which showed a decrease of $333,196 over July, 1926. Considering the dividend and other rentals a balance available for other purposes was a deficit of $465,310, which was an increase of $1,198,227 for July, 1926.

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Personal Items

Samuel Kahn Elected President of Market Street Railway

Samuel Kahn, executive vice-president of the Market Street Railway, San Francisco, Cal., has been elected president. Mr. Kahn has been executive head of the company since the end of 1925, when the Byllesby organization acquired control. He has been connected with the Byllesby organization since 1910, when the utility properties with which he was affiliated in Fargo, N. D., were acquired by the Byllesby interests.

Four London Underground Officers in United States

A delegation of four officers of the London Underground will make a trip to the United States in September and October this year to attend the convention at Cleveland and inspect railway properties in the United States. The men who plan to come are: J. P. Thomas, operating manager of railways of the London Underground Railways; R. H. Pitts, staff officer of the London Underground Railways; W. S. Every, signal engineer of the London Underground Railways; Owen Watson, experimental engineer of the London General Omnibus Company.

The members of the party will travel more than 9,000 miles. They expect to visit Quebec, Montreal, Ottawa, Winnipeg, Minneapolis, Chicago, Detroit, Cleveland, Buffalo, Toronto, Pittsburgh, Washington, Baltimore and Philadelphia.

Their headquarters while here will be the National Railway Appliance Company, Lord Ashfield's representative in this country, 420 Lexington Avenue, New York City.

HOWARD ELLIOTT, chairman of the Northern Pacific Railway and at one time operating head of the New York, New Haven & Hartford Railroad, owning the Connecticut Company, received the honorary degree of Doctor of Laws at Carleton College, Northfield, Minn., recently. He was graduated from Harvard in 1881 and is now president of the board of overseers of Harvard. Mr. Elliott received honorary degrees from Middlebury College in Vermont in 1916 and Trinity College at Hartford in 1924.

JESSE BLYTHE, well-known St. Louis newspaper reporter and advertising man, has been appointed assistant director of the Missouri Committee on Public Utility Information, St. Louis, Mo. Prior to joining the John Ring, Jr., Advertising Company seven years ago, Mr. Blythe was connected with St. Louis daily newspapers as reporter. One of the outstanding things he did while he was with the advertising agency was to handle the municipal advertising campaign intended to bring new industrial concerns to St. Louis.

Walter C. Becker Superintendent of Bus Service in Chicago

Walter C. Becker has been appointed superintendent of bus service of the Chicago Surface Lines, Chicago, Ill., reporting direct to Vice-President G. A. Richardson. Mr. Becker will have charge of the operation and maintenance of buses operated by the company in addition to his duties as assistant superintendent of the utility department.

When a new utility department on the Chicago Surface Lines was established in 1925 to succeed the department of stables, wreck wagons and supply cars

W. C. Becker

Mr. Becker was appointed to take charge of automotive equipment in the new department. Thomas Blakely was made superintendent and David A. Robinson another assistant superintendent. The order carried with it a plan for placing the equipment on a completely motorized basis.

After three years study of electrical engineering in the University of Illinois Mr. Becker entered the employ of the Chicago City Railway under the late A. A. Thurlby, superintendent of wires and cables. A few years later he was made assistant to Mr. Thurlby. Following the unification of the properties in 1914 he was transferred to the electrical department, where he was employed for six years as assistant superintendent of line transmission. In 1920 he was placed in charge of automobiles and other vehicles in that department and within two years all horses in his care had been disposed of and the department completely motorized. This training, together with the fact that Mr. Becker had learned the machinist's trade in his early youth, made him a good choice for handling the automotive equipment.

OBITUARY

J. Ogden Armour

J. Ogden Armour, who died in London on Aug. 16, was never an officer of an electric railway, but he poured his money in a prodigious stream into both the Sioux City Railway, Sioux City, Iowa, and the Metropolitan Street Railway, Kansas City, Mo. In the case of the Metropolitan Street Railway he followed its vicissitudes and the vicissitudes of its successor, the Kansas City Railways, backing his friends with his funds, only to see his unsecured claims of about $2,000,000 disallowed in the final reorganization from which the Kansas City Public Service Company has evolved as the successor company. These and the other interests of Mr. Armour in utilities were overshadowed by the active participation of the man in the packing industry, but his quiet work in utilities as a capitalist was not without its influence.

In many respects Mr. Armour was no less a public character than was the late Judge Gary. There was, however, this difference. The one died at the zenith of his career; the other at the nadir of his. Both men came in for wide publicity because of their prominence. In Mr. Armour's case his personal privacy was often violated in the effort to make copy of the activities of a man who was cautious, modest, conciliatory, well poised and generous, a man devoted to business, but leisure loving.

It is well to remember that Mr. Armour as the son of Philip D. Armour imbibed from his shrewd, hard-headed, hard-working, alert, impulsive father much of his scion's toleration with frail humanity, made immortal in George Horace Lorimer's "Letters of a Self-Made Merchant to His Son," in which everybody who knew the elder Armour immediately identified him with old man Graham of the Lorimer letters. And so the son was well fortified to endure the colossal losses that he did, losses said to have amounted to $1,000,000 a day for a period of about 130 days, sustained because of the relentless working of economic forces the progress of which no man could stay and few could contemplate with equanimity, particularly the desertion of associates. Under the circumstances Mr. Armour probably suffered less than would others, not because he was more callous, but because he was more conscious of man's inhumanity to man.

In 1881 J. Ogden Armour entered Sheffield Scientific School at Yale. For seventeen years after he left college, Mr. Armour devoted his entire attention to the packing business. He had assumed executive responsibilities under his father after an apprenticeship in learning the ropes. Thus it was that after the father's death, in 1901, he was able to step into the place of the founder and build even more rapidly. Under his direction the business of Armour & Company increased from $182,000,000 a year to more than $1,000,000,000.

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Manufactures *and the* Markets

Ceremonies Mark Beginning of Buffalo Track Work

The actual start of the track reconstruction and repaving program of the International Railway, Buffalo, N. Y., which will involve an initial expenditure of $250,000 in the next four months, was turned into a community celebration when Bernard J. Yungbluth, president of the company, and William C. Hornung, vice-president of the North Fillmore Avenue Business Men's Association, pried loose the first old cobblestone between the rails of the Fillmore Avenue line while a crowd cheered. The ceremonies marked the beginning of a city-wide improvement schedule.

A new type of track construction for city streets in Buffalo will be undertaken on the Fillmore Avenue line. T-rails will be laid on this route with stone blocks lining the inside of the rails. Asphalt will be used between the tracks and for a foot on each side, in accordance with new specifications which have been approved by the Buffalo City Council.

Metal Prices Sag Slightly

With the exception of tin, the prices of all of the more important non-ferrous metals are somewhat lower in both the American and English markets than they were a week ago on Aug. 16. Considering the quietness in the demand, however, prices have held very well, especially those of copper.

The large producers are asking from 13¼ to 13⅜ cents, delivered, with full realization that these quotations are only nominal and to be obtained only where special conditions apply. Those who make a practice of selling their intake from week to week are quoting from 13.05 to 13⅛ cents for customary Eastern deliveries, but are selling only a very moderate tonnage, there being little interest by consumers just now at any price. Dealers are apparently holding more copper than usual, and several hundred tons have been picked up during the week as low as 13 cents, delivered. The foreign demand has been as quiet as the domestic, though a little more interest was taken abroad on Aug. 23, coincident with a reduction in the c.i.f. price of the export association from 13.65 to 13½ cents.

The week ended Aug. 23 has witnessed a further fall in lead prices, but in spite of the relatively low figure at which the metal was obtainable, consumers have shown little interest and the volume of sales has been small. In accordance with the general downward trend of the market, the American Smelting & Refining Company has reduced its contract price from 6.75 cents to 6.60 cents, New York.

Zinc is only slightly lower than last week, quotations over Aug. 22 and 23 being in the neighborhood of 6.30 cents, St. Louis, compared with 6.35 cents a week ago. Forward deliveries are inclined to be slightly higher than prompt. High-grade zinc is unchanged at 8 cents nominal, for small tonnages of spot metal, delivered in the East. On Prime Western, the New York market is at the customary freight differential of 35 cents per 100 lb. above St. Louis.

The tin market, which is never entirely governed by consumers' demands, remained fairly firm, but most of the sales were to dealers. Consumers, by large forward buying at the low prices which prevailed recently, seem to have provided themselves with most of their immediate requirements.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

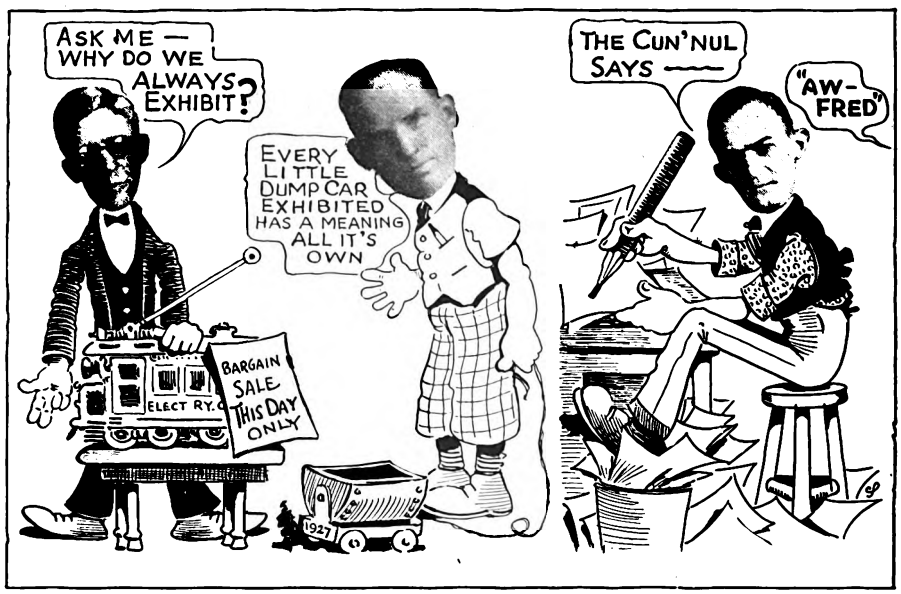
Metals—New York	Aug. 23, 1927
Copper, electrolytic, cents per lb.	12.875
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.65
Zinc, cents per lb.	6.30
Tin, Straits, cents per lb.	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.375
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	2.10
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings. Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.63

Chicago Rapid Transit Builds New $40,000 Station

A new $40,000 station of the Chicago Rapid Transit Company is being built at Western Avenue, Chicago, on the Ravenswood branch of the system. The new structure replaces an old wooden building which has served patrons of the Rapid Transit Lines since operation was started on this branch in 1908. The building will be modern throughout and will conform with the new standard type of station adopted by the company. It is expected to be completed about Sept 15.

The station is artistically designed in

EXHIBITOGRAPHS—No. 4



Here we have a rare combination of locomotion, elimination and execution. This gentleman on your immediate left, he with the "no pushee-no pullee" apparatus, is none other than Signor Campbell, whose firm, the Baldwin Locomotive Works, has been making machines to overcome inertia since shortly after the days of the "Strowbridge Lion."

Going East, we find a gentleman with a flowery name, although he wasn't born to blush unseen. His middle name implies fortitude against all difficulties, especially those encountered in removing superfluous material from the right-of-way. Oldtimer, you have guessed his name. Newcomer, he's H. Fort Flowers of the Differential Steel Car Company. Like the gentleman on his right, he practices what he preaches. "Exhibit," he advises, and straightaway takes his own advice.

And now our friend at the desk. He is not a movie star answering "mush" notes, but rather Fred Bullock, prime minister to Cun'nel Alexander, who executes rather than talks. What the Cun'nel says is the *sine qua non* to Fred. What a battery for the big game in October—Fred and the Cun'nel, a greased skyrocket and chained lightning.

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terra cotta with old English Mission style brick panels and is equipped with all modern facilities for public comfort and convenience. The spacious interior contains ticket booths, benches and lavatories and meets all the requirements of service features afforded in other new Rapid Transit stations of similar type. The interior is finished with art marble wainscoting throughout, with floors of terrazzo. Space for three stores is contained in the building at either side of the entrance. A. U. Gerber is the architect.

"Ship Early" Is Plea to Cleveland Exhibitors

SHIP early and prepay freight is the slogan recently broadcast to exhibitors at the Cleveland convention, Oct. 3-7. Fred Dell, director of exhibits of the A.E.R.A., not only issues this warning but invites attention to the various rules for shipping adopted by the exhibit committee. Of special importance in Mr. Dell's circular is the news that exhibitors in the Central Electric Railway territory may ship over three interurban lines, namely, the Cleveland & Southwestern Railroad, Northern Ohio Power & Light Company and the Lake Shore Electric Railway. All three roads enter the Bolivar Road station and all shipments via these lines should be marked for this station.

Norris Brothers Company has been designated as the official drayman and all freight shipments should be sent in its care, at 2138 Davenport Avenue, Cleveland. The address should be as follows:

Your Firm Name
Care of Norris Brothers Company
2138-44 Davenport Avenue
Cleveland, Ohio
Space No. .....
For American Electric Railway Association Convention.

In shipping of display cars, they should be sent in care of the Cleveland Railway, Harvard Avenue yard, Newburg & South Shore Railroad delivery. Electric locomotives, gasoline rail cars, dump and crane cars shipped on their own wheels should be billed to the Norris Brothers Company, Pennsylvania Railroad, City Hall spur track, Cleveland Public Auditorium. In the case of express shipments the consignment should bear this label:

YOUR FIRM NAME
For
American Electric Railway
Association Convention.
Space No.
Cleveland Public Auditorium
Cleveland
Ohio

In all cases the parties making the shipment should address the consignment to their respective firms, placing the name of Norris Brothers Company, Cleveland Railways, or the American Electric Railway Association next in the address. Also the exhibit space number and notation, for American Electric Railway Association Convention, should be on the tags.

Besides the electric carriers mentioned, the following steam roads enter Cleveland:

STEAM RAILROAD LINES

Pennsylvania Railroad—Car load and local freight, Davenport Station.

New York Central Railroad—Car load, N. Y. C. R. R., E. 38th Street, team track, local freight to Orange Avenue.

The two roads mentioned are nearest the Cleveland Public Auditorium. If conditions at the shipping point are such that it is not convenient to use the Pennsylvania or New York Central, the following instructions will hold:

Nickel Plate Railroad—High level team track.

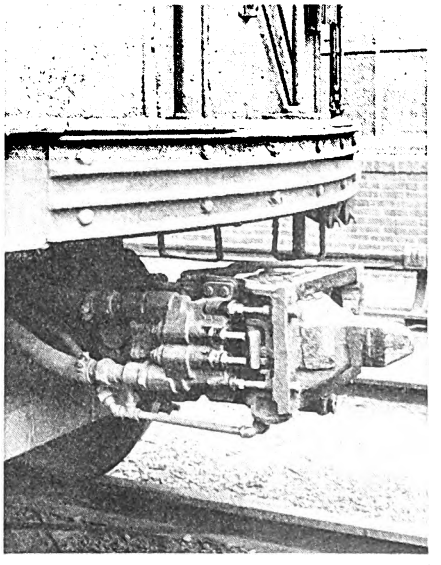
Big Four Railroad—W. Ninth Street Terminal.

Baltimore & Ohio Railroad—Columbus Road.

Erie Railroad—Scranton Road.

Van Dorn Type 1050-A Coupler Embodies Several Improved Features

Philadelphia Rapid Transit Company, Philadelphia, Pa., recently announced the purchase of 218 car sets of Van Dorn type 1050-A tight lock car and air couplers from the Van Dorn Coupler Company. These will replace type No. 19 pin and link couplers of the same make that have been in service for twenty years on the Market Street elevated cars.



View showing Van Dorn type 1050-A tight lock car and air coupler with housing removed

The 100 Frankford elevated cars owned by the city of Philadelphia and leased by P.R.T. are equipped with Van Dorn type 1050 couplers, which have been in operation for approximately four and one-half years. The type 1050-A coupler is said to embody several improved features over type 1050, particularly in the air coupling devices.

It is rumored that 150 cars purchased by the city for operation in the new Broad Street subway are to be equipped with Van Dorn couplers similar to the type 1050-A, but of a heavier model suited to the increased size of cars.

Work on Philadelphia Tube Extension to Start Soon

Excavation on South Broad Street, Philadelphia, will begin within ten days after the contract has been duly signed by the Mayor, Director Ehlers of the Department of City Transit and the Heyman & Goodman Company, New York, N. Y.

Surety bonds covering the $7,269,000 contract for the subway extension and guaranteeing strict performance of the terms by the construction company have been drawn by the National Surety Company. Two bonds of $4,050,000, totaling $8,100,000, will cover the amount allowed as the outside limit of the cost as provision against unforeseen expense. The bonds were drawn in the Philadelphia office of the National Surety Company and signed by City Solicitor Gaffney, the Mayor, Director Ehlers and City Controller Hadley.

The work on South Broad Street will extend from City Hall to Kater Street, below South Street.

Subsidiary for Westinghouse Airbrake

The Westinghouse Airbrake Company, Pittsburgh, Pa., has created a new subsidiary, the Westinghouse International Brake & Signal Corporation of Delaware, with capitalization of 1,000,000 shares of no par value. This is the first step of the company to consolidate its foreign business under the control of one subsidiary. Stocks held in separate companies in England, France, Canada, New South Wales and Italy will be taken over, giving the International a controlling interest in the companies.

Work Progressing on Five-Car Order for Philadelphia & Western

While no definite date has been announced for delivery of the five two-man all-steel interurban cars ordered by the Philadelphia & Western Railway, Norristown, Pa., from the J. G. Brill Company of Philadelphia, work on the units has progressed to a point where A. M. Robinson, publicity manager for the car company, has released the following specifications. As announced in

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the JOURNAL for Feb. 19, the cars will have an over-all length of 50 ft. 6 in. Their design includes smoking and passenger compartments and they will be mounted on Brill 27-MCB-2-X trucks, equipped with Westinghouse 535-B-1 inside hung motors. Wheels of 30-in. diameter have been specified. Doors will be located at both ends and in the center. The seats are upholstered in hand-buffed brown Spanish leather. Specifications follow:

Number of units	5
Type of unit	Two-man, motor, passenger, interurban, double end, double truck
Builder of car body	J. G. Brill Company
City and state	Philadelphia, Pa.
Date of order	1/28/27
Weights:	
Car body	26,070 lb.
Trucks	19,030 lb.
Equipment	17,985 lb.
Total	63,085 lb.
Bolster centers	30 ft. 0 in.
Length over all	50 ft. 6 in.
Length over body posts	40 ft. 8 in.
Truck wheelbase	6 ft. 4 in.
Width over posts	9 ft. 3 in.
Height, rail to trolley base	13 ft. ½ in.
Window post spacing	20 in.
Body	All steel
Roof	Arch
Doors	Center and ends
Air brakes	Westinghouse AMM
Armature bearings	Plain
Axles	A.S.T.M. spec. A-2—21
Car signal system	Faraday buzzers
Compressors	DH-25
Conduit	Metal
Control	Westinghouse ALMPC
Couplers	Tomlinson, Form 16
Curtain fixtures	Curtain Supply Company's No. 48
Curtain material	Pantasote
Destination signs	Railway company's portable
Door mechanism	National Pneumatic
Doors	Sliding
Energy-saving device	Economy watt-hour meter
Finish	Paint
Floor covering	Tuco
Gears and pinions	Nuttall solid forged steel
Glass	Libbey-Owens
Hand brakes	National staffless
Heaters	Railway Utility Company's truss plank
Headlights	Golden Glow HDD—No. 128
Headlining	Agasote
Interior trim	Statuary bronze, Haskelite side linings
Journal bearings	Prommet, plain
Journal boxes	Brill
Lamp fixtures	Electric Service Supplies
Motors	Four Westinghouse 535-B-1, inside hung
Painting scheme	Moss green
Registers	Ohmer
Roof material	⅛-in. poplar covered with No. 8 canvas
Sash fixtures	Brill Renitent
Seats	Three cars Brill 202-B-1, two cars Hale & Kilburn
Seat spacing	20 in.
Seating material	Hand-buffed brown Spanish leather
Slack adjusters	American Brake Company's type J
Steps	Stationary, triple
Step treads	Wood
Trolley base	U. S. No. 20
Trolley wheels	No. 60-B
Trucks	Brill 27-MCB-2-X
Ventilators	Railway Utility Company
Wheels	Standard r.s., diameter 30 in.

More Rails for Los Angeles

One thousand tons of 116-lb. steel girder rail arrived at Los Angeles harbor recently on a steamship of the Isthmian Line. This completes the delivery of two thousand tons of rail ordered several months ago from the U. S. Steel Products Corporation.

ROLLING STOCK

HAMILTON STREET RAILWAY, Hamilton, Ont., Canada, has awarded a contract to the National Steel Car Company, Hamilton, for twenty new cars to cost about $240,000.

TORONTO TRANSPORTATION COMMISSION, operating the municipal railway at Toronto, Ont., has placed in service nine Mack six-cylinder buses. They are of the 29-passenger parlor-car type, with 233-in. wheelbase.

MIDDLESEX & BOSTON STREET RAILWAY, Newtonville, Mass., has received the last of twelve White buses, Model 50-B. The company's fleet now consists of 64 Whites.

WISCONSIN POWER & LIGHT COMPANY, Fond Du Lac, Wis., has ordered two Fageol (A.C.F.) parlor cars, making a total of thirteen for this company.

GRAND RAPIDS, GRAND HAVEN & MUSKEGON RAILWAY, Grand Rapids, Mich., has ordered six model 508, 27-passenger parlor cars from the American Car & Foundry Motors Company.

LOS ANGELES RAILWAY, Los Angeles, Cal., has ordered eight new single-deck buses, five 29-passenger Fageols and one 29-passenger and two 21-passenger buses of Yellow Coach manufacture.

TRACK AND LINE

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., is planning to rehabilitate its Eighth Street surface and elevated line through the tunnel from Kansas City, Mo., to Kansas City, Kan. Application for permission to carry out the program has been filed with the State Public Service Commission. The company's new charter approved the rehabilitation of this line, part of which was condemned and abandoned in 1922.

BERLIN STREET RAILWAY, Berlin, N. H., is replacing worn rails on some of its lines. The new rails are being laid on ties, the former practice of laying them on the rolled stone foundation having been found unsatisfactory.

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY, Indianapolis, Ind., and INDIANA SERVICE CORPORATION, Fort Wayne, Ind., will have to improve their right-of-ways at the edges of Lafayette, Ind., with hard-surfacing material, according to resolutions recently passed by the Lafayette Board of Works. A time limit of Nov. 1 was set for completing the work.

TRADE NOTES

AMERICAN CABLE COMPANY, Chicago, announces that Charles A. Perryman is now associated with the company in the capacity of assistant sales manager, with headquarters at 105 Hudson Street, New York City. Mr. Perryman was formerly sales manager of the wire rope department of the Wickwire Spencer Steel Company.

E. D. TREANOR has been appointed managing engineer of the distribution transformer department at the Pittsfield, Mass., plant of the General Electric Company, it has been announced. As managing engineer of that department, Mr. Treanor will also have general supervision of the engineering on distribution transformers manufactured at the Fort Wayne, Ind., and Oakland, Cal., works of the company.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has developed a new red protective paint for use with d.c. motors which are subject to acids, alkalis, oil or dust. It is being adopted by many industrial plants, according to advices from the company, and is being used not only on the commutators of d.c. motors but also on locomotive storage batteries, field coils on d.c. pump motors exposed to oil and moisture, stators of induction motors and on insulation adjacent to commutator bars.

ADVERTISING LITERATURE

LEBANON STEEL FOUNDRY, Lebanon, Pa., describes "heat treatment" in its sixteenth of a series of bulletins being issued on the subject of electric furnace steel castings.

MITCHELL - RAND MANUFACTURING COMPANY, New York, N. Y., has distributed bulletin No. 696, on compounds.

DRIVER-HARRIS COMPANY, Harrison, N. J., manufacturer of Nichrome resistance wire, has published an amusing booklet entitled, "What's your pet superstition?" It contains eighteen cartoons illustrating "pet superstitions."

WESTON ELECTRICAL INSTRUMENT CORPORATION, Newark, N. J., has sent out bulletin No. 4,000, which lists Weston railway instruments.

DODGE BROTHERS, Detroit, Mich., in its truck division, has prepared a clever advertising circular for Graham Brothers trucks. On the side of one of the trucks pictured appears the name of the company to which the circular is being sent, with the caption, "Give your driver a good job."

AMERICAN STROMBOS COMPANY, INC., Philadelphia, Pa., describes Strombos locomotive whistles in a recent bulletin.

GENERAL ELECTRIC COMPANY Schenectady, N. Y., has added to its looseleaf advertising folders the following sheets: Direct heat electric furnaces, types AD, RRB and RRC; automatic reduced voltage starters, CR 7061-Q2 and CR 7061-S2, for synchronous motors; GE cartridge units; type RP metal melting pots, electrically heated; type D mechanical drive turbines; push-and pull-button control switches; GE turbines, 2,000 to 6,000 kw.; station oil circuit breakers, types FH-103, FH-203, FH-206 and FH-209; CR 3202 drum controllers for two or three phase slip-ring induction motors; GE induction frequency changers for furnishing power to high-speed motors at higher than normal frequencies, types ITT and IQT; semi-automatic reduced voltage starters for synchronous motors; automatic station control equipment; outdoor station equipment, type LG-207 disconnecting switch and choke coil; CR 7006-D20 magnetic switch; automatic switching equipment, 600-volt d.c. reclosing feeder with type MC-2 air circuit breakers; CR 7771 and CR 7772 duplex controllers, and solenoid-operated air circuit breakers, types CP-3 and CK-3.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, September 3, 1927 *Number 10*

Convention Program Assures Interest at Cleveland

WERE there any doubt in the mind of anyone as to the value of the 1927 Cleveland convention, it would be dispelled by a perusal of the program, published in full elsewhere in this issue. The list of speakers and the arrangement show much care on the part of Chairman Harry L. Brown and his associates on the committee on subjects and meetings.

The morning sessions will be only two hours long instead of three, as in former years. Those on Monday and Tuesday will be devoted entirely to the presentation of addresses by men outside the industry. Many men of prominence in American business, who can bring a new trend of thought to the leaders of the industry, are included among the speakers. Thursday morning's session will be a symposium on the progress of the industry, consisting of five-minute talks by operating executives on the feature accomplishments of the year.

The salient change will be the inauguration of a series of luncheon conferences on fourteen major industry subjects. These necessarily will be limited to small groups, not over 50 each. There will be an opportunity for an informal cross-table exchange of questions, opinions and experience of men thinking along the same line. There will be no set speeches or papers. A sponsor has been selected for each luncheon who will get discussion started and perhaps guide it if the members get too far off the subject. The plan should tend to satisfy the criticism of the younger executives who feel that they never have an opportunity to exchange views with the older men who are leaders in the industry.

The Affiliated Associations Also Have Modernized Their Programs

GLANCING through the programs of the affiliated associations for the Cleveland convention, it appears that they, too, have undergone a metamorphosis similar to that to which the American Association has been subjected. The long list of committee reports which formerly made up the bulk of the three afternoon sessions has been replaced by addresses by men who are authorities on their subjects. As the committees have their reports prepared and printed in advance, formal acceptance is all that is necessary unless the delegates take issue with one more of the recommendations. As a rule comments are forwarded to the chairman in writing, so that even in this event there is not always need for discussion on the floor.

The Engineering Association, of course, has many technical committees which make standards for the industry that must be acceptable to a large number of operating companies if they are to become effective. Even here an innovation has been found possible which will rectify one of the great difficulties of the former conventions, that of too great a waste of time of all the delegates discussing details in which they have little or no interest, or worse still, listening to such a discussion while waiting for their own specialties. The Tuesday session will be divided into four groups, the subjects being primarily way and structures, rolling stock, purchases and stores, and power. Delegates can then attend the sessions in which they have greatest interest and will be in a position to discuss intelligently those features with which they are vitally interested.

What Are the Manufacturers Going to Do About It?

PRELIMINARY figures submitted to the executive committee at its recent meeting in Cleveland indicate some question regarding the proportions and character of the car exhibit planned for the coming convention. President Sawyer pointed out in no uncertain terms the responsibility which every manufacturer and operator has for giving particular thought to the importance of an impressive and representative car exhibit at this year's convention.

The big problem before the industry today is that of providing a type of car which will attract riders. Appearance, comfort, quietness, speed and safety are the big selling requirements. There is nothing inherently to the advantage of the rubber tired vehicle in these respects, with the possible exception of flexibility. To offset this, the car has many advantages and presents a problem in design much simpler than does the automotive vehicle carrying its own power plant. The mistaken notion that there exists a mysterious "rubber urge" has been almost completely dissipated. But there is in transportation a definite demand for "style," to use that word for want of a better term—and the rider doesn't care particularly whether it comes on rail or rubber.

Imagine really modern cars on the streets today, with automobiles of the vintage of even only ten years ago, and there is presented the reverse of the situation that now exists. There wouldn't be much difficulty about selling street car rides under those conditions. But the automobile manufacturer has been too alert for that. When he ran out of other improvements for his vehicle, he developed balloon tires and four wheel brakes.

Surely, the electric railway market today presents one of the most unusual merchandising situations in the history of American industry. The customers *demand* that the manufacturers show their wares. Railway executives insist that the builder who has cars to sell bring along his goods for them to look at. President Sawyer and the executive committee made it perfectly clear that the industry needs an impressive car exhibit. Operators are keenly interested to know what can be done to win back former patrons who are paying from 15 to 30 cents per mile for transportation which they consider more attractive.

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Space for approximately 20 cars has already been reserved and there is still reasonable assurance that the exhibit will at least equal if not exceed that of last year in the number of cars shown and in the extent of development represented. But the time is getting short. The convention went to Cleveland in order to make a large car exhibit possible. President Sawyer has challenged the spirit of the manufacturers as reflected in the space applications for car exhibts. What are they going to do about it?

Will Chicago Persist in Delay?

SERVICE by bus established by the Chicago Surface Lines in Diversey Parkway forms the subject used by the Chicago *News* to point a moral and adorn a tale. The moral is that Chicago needs "co-ordination on a city-wide scale." That paper says that for the same reason, bus service in Diversey Parkway, operated by the electric railway and made a part of its transportation system, is better and cheaper than would be an independent bus service on that thoroughfare, a close, co-ordinated, non-competitive system, providing both neighborhood service and rapid transit through buses, street cars, elevated and subway trains, would be an immense improvement over present conditions. That, of course, represents in essence the idea behind the program for co-ordination advanced for approval at the last session of the Legislature, but lost at that time on account of bickering over details. That mistake Chicago will have a chance to correct at the promised special session of the Legislature.

The *News* urges the people now to support the efforts of the local transportation committee of the City Council to bring about by negotiations a city-wide unified service to suit the needs of all the citizens. Of course, no announcement to that effect has been made, but in its enthusiasm for the idea the *News* says it may be assumed that, legal doubts having been cleared away by litigation, the auxiliary service of buses will be extended by the railway to various other sections now lacking proper transportation. That, of course, is mere prophecy. There is, however, nothing fanciful about the immense advantages that would be derived by the people of Chicago from a unified subway, elevated, street car and bus service, furnished at cost. Under the existing competitive service of surface cars, elevated trains and buses patrons pay the cost in inconvenience and delay, if not in double or triple fares. The wonder is that the pettishness of politicians should be permitted to interfere with the acceptance of facts self-evident.

Speed—A Vital Factor in Transportation

SPEED, and yet more speed, is a demand that ever has dominated transportation, public or private. For ages inventors have dreamed of means to annihilate space. Many of their schemes have been attended with some great measure of success, as witness the transportation systems of today. Horse cars were introduced with the idea of a more rapid means of travel, and they were electrified for the same reason. The advent of the bus had much the same idea in mind, to provide a vehicle faster than the best street railway cars. As yet it has not shown much superiority, and cars and buses give service on city streets that differ little if at all with respect to speed.

Of late years so many restrictions have been placed on the movement of vehicles in city streets that both cars and buses have been forced to reduce schedule speeds rather than to increase them. After fruitless attempts to modify onerous regulations, managers have been prone to take the position that Mark Twain did with respect to the weather, talking a great deal and doing very little.

It is refreshing to have an entire meeting of a utility association devoted to the subject of "Increased Speed with Safety," as the Transportation Section of the Wisconsin Utilities Association did last week.

It appeared to be the general opinion that transportation men have not done anything like all they can to obtain higher speeds. That there is an opportunity to get materially reduced running time for cars and buses without an increase in danger and frequently without any increase in the maximum speed of the vehicle, was shown by several of the speakers. The paper by E. J. McIlraith, staff engineer Chicago Surface Lines, published last week, gives many reasons advanced for delays on the average car trip, all of which tend to reduce the average speed. Some of the causes listed are inherent to public transportation, so that at best their influence can only be minimized. Others, while they may be observed on many systems, are not at all necessary, and a determined effort may eliminate them entirely. J. H. Lucas, in the article published this week, stressed the importance of much higher acceleration and braking rates than those in common use today. These will permit the street car to keep its place alongside the modern automobile whereas now even the truck can frequently pass the car.

In any event a careful analysis of conditions on any property will disclose a number of means by which delays can be minimized and the schedule speed correspondingly improved.

The Press as a Public Relations Agent

SPEAKING before the newspaper group of the International Advertising convention at Denver recently, J. C. McQuiston of the Westinghouse organization laid down eight reasons why his company favored the daily press as a medium for advertising and good will. Briefly, these were: Intimacy, flexibility, dealer tie-in, reader interest, immediate sales, co-operative good will message, sales support and checking results.

While all of these points may be and are applicable to the public utility advertising and public relations, the fourth point merits special discussion. In explanation Mr. McQuiston remarked:

> Fourth, reader interest. The newspaper habit has caught every worth-while American and he buys and reads his daily paper. Any message, therefore, in the newspaper comes to him fresh and welcome.

Reader interest! That is what every publicity writer desires above everything else. If it is secured, then there are returns on investment greater than can be shown by cold figures. Especially is this true when one seeks to exchange honest intentions for the good will of a community; when one barters a "mental commodity" for a price that is equally as intangible. This leads us to the question of which is best, mass approach or private approach; in other words, in the public utility field, the pamphlet, dodger and poster as compared with display space in the daily press. With the former method the company's message is generally read when the reader is riding alone, when his mind in many cases is dis-

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tracted with other thoughts. While this in a measure is true of the daily paper; that is, that the average man reads it on his way to or from work, there are these traditional considerations that seem to argue eloquently for the latter medium of presenting any civic problem. Probably this is best explained by two questions: Which expression do we hear most on the street, in the office, at the club—"I see by the papers that," or "I read in one of the Blank Traction Company's pamphlets so and so"? How many company pamphlets does one see on the library table or protruding from a citizen's pocket as compared with the newspapers one sees in similar locations? The first method presents the company argument concentrated. The second approach has the background of the day's news. Which message comes to the reader "fresh and welcome"?

Here is a question that evidently has not been given the consideration it deserved. Undoubtedly there are a great many utilities using the first method alone. There has been a distinct trend, however, toward the use of newspaper copy, usually in combination with car pamphlets. The relative value derived from these two classes of advertising is a question of interest to every publicity director and manager. There is always the problem of weighing the value of the greater appeal of newspaper space in comparison with the pamphlet, against the relatively higher cost of display space advertising. Whatever method may become popular in future there is this all-important factor to be sought—reader interest! And, what is most to be desired, the corollary, intelligent reader discussion and fair analysis. Such a happy combination must obtain for public relations advertising to be more than a mere gesture.

The Story of a Horse that Died

ONCE there was a man who tried to train his horse to live on an ever-diminishing quantity of oats. But when the ration finally got down to one oat per day, the horse died. Sometimes the economies practiced by electric railways are based on theories just as unsound as those of the man who starved his horse to death.

Take the case of a certain railway in a large Eastern city. Formerly a double-track line ran right to the door of a busy railroad passenger terminal and stopped there. A double crossover located about 100 ft. from the ends of the tracks made it possible for two cars to discharge passengers at one time, change ends and pick up passengers for the return trip. When the city recently undertook to repave the street, the railway decided it would reduce its maintenance cost by removing the double crossover and a considerable length of the second track, and make use of a single crossover 500 ft. away, leaving a single-track stub terminal.

Cars are operated on a comparatively short headway on this route, however, and frequently a second car approaches the end of the line before its leader has begun the return trip. While formerly the second car could continue right up to the railroad terminal and discharge its passengers, now it must wait a block away until the car ahead has cleared the single-track section. Passengers have the option of getting out and walking the last few hundred yards or waiting in the car and possibly missing their train connection.

Doubtless a certain saving in maintenance will result, as expected, from the removal of one track. An even greater saving probably could be accomplished by the abandonment of more track. No one is in a better position to know about that than the management of this particular railway, as many miles of its track have been abandoned in recent years. If this process were carried far enough, track maintenance costs could be entirely eliminated. When that goal had been reached, however, the management would wake up some morning to discover that its patronage, like the horse, was dead.

Why Not Name Cars for the Men Who Operate Them?

EXPERIENCE in public relations has proved that the more personal these relations the greater the results. Formality is the crust—informality the filling in the social pie. A handshake, and calling a man by name, are a thousand times better than a mere nod and a "Good morning." Many of us know the milkman, postman, and shopman by name. The vehicle he drives, his step on the flagstone, or the manner in which he racks his goods in the store are always associated with the respective individual. The longer the association the more fixed is this impression.

Realizing this some of the steam railroads in recent years have made it a practice to name engines after the enginemen who drive them, especially when the driver has a long time service record. Going into the terminal of such a road, one sees the man and locomotive merged into one personality through the medium of a name placed in gold letters under the cab window. One sees personal pride reflected from steam dome to cow catcher. Again, follow this locomotive on its run. See the hand waves, and hear the salutations from young and old! In other words, a little gold leaf and a few letters tell the world a story of personal service and company appreciation. They invite friendship.

Why not this practice on street cars? Think of the millions of car patrons whose daily habits are such that they invariably strike the same car every morning. Suppose they saw this legend on the dashboard of a city or interurban car:

This car is named for

WILLIAM S. JONES

During 40 years of service we have found him safe and dependable. You will find him the same

Or perhaps this is too long. Just

WILLIAM S. JONES

will suffice, with a little publicity to make the first and only introduction necessary. Adopt this method and the machine becomes a man and the man ceases to be a machine. One trial of this plan and it is more than probable that William S. Jones will become as well known in the community as is the "Skipper" of the Toonerville Trolley among the readers of the famous cartoons throughout the nation. Whether the car is constantly manned by the honored operator is relatively an unimportant matter. It more than likely will make the public more inquisitive as to his absence when he is off duty. The psychological effect will still obtain.

The practice of naming cars after former citizens and institutions of learning, recently adopted by many utilities, is commendable, a progressive step, yet not the only possibility especially where progress is the watchword and personal public relations loom as the alpha and omega in the program of popularizing transportation.

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Examples of Emblems Applied by the Decalcomania Process

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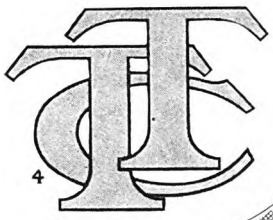
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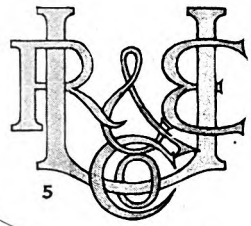
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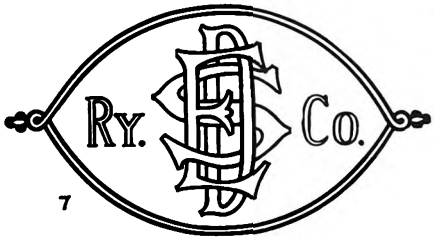

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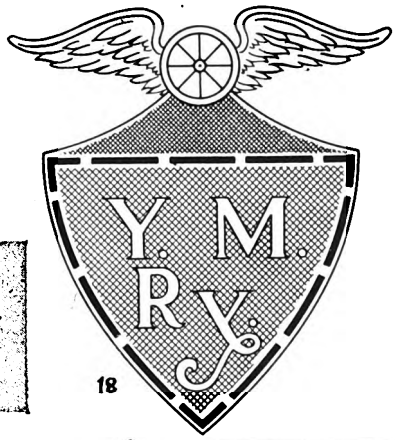

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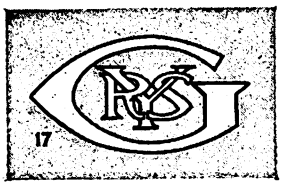
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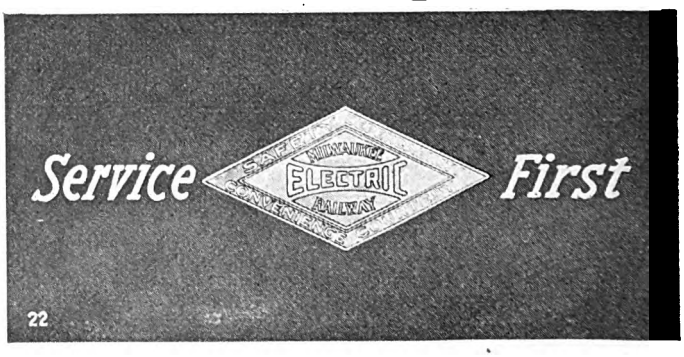

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(See page 383 for captions)

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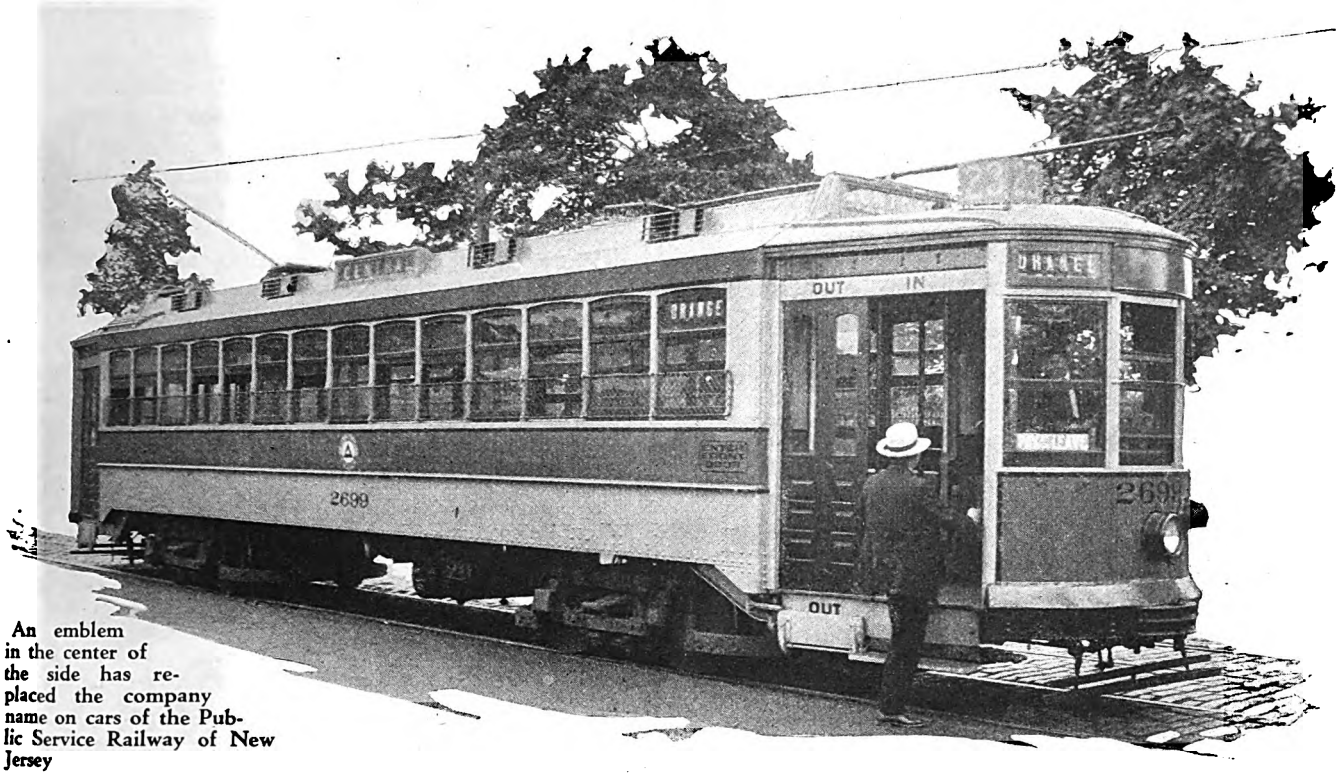

An emblem in the center of the side has replaced the company name on cars of the Public Service Railway of New Jersey

Emblems Identify ROLLING STOCK

Survey shows that improvement in public relations and economy in painting cars and automotive equipment result from the use of symbols and monograms

LIKE old wine, the emblem which is displayed on the rolling stock of an electric railway improves with age. Relationship between the company and its public grows more cordial as time goes on and the emblem becomes more familiar. This is the opinion of a majority of officials of electric railways now using various kinds of emblems, symbols and monograms on their equipment, as indicated by a survey recently made by this paper. Only the other day the librarian of one of the largest insurance companies in America telephoned the JOURNAL's office to ask what symbol or trademark was used by a certain midwestern electric railway—presupposing that it did use one. While the company in question does not employ an emblem, their popularity in general seems to be spreading throughout the country.

When buying new cars and remodeling old cars one of the first questions that arises in painting is how to make them attractive in the most economical way. A number of electric railway companies have found the answer in the use of emblems. To determine the experience of the industry, a questionnaire was sent to a large number of electric railways in the United States and Canada asking if they used emblems; their reasons for using them; whether it is more or less expensive than lettering the name; what process they used, and whether a slogan was used. Among the replies received, 45 companies said they used emblems.

Emblems Applied by Decalcomania Process

1—Kansas City Public Service Company.
2—Chicago, South Shore & South Bend.
3—Georgia Power Company (automotive equipment only).
4—Toronto Transportation Commission.
5—United Railways & Electric Company (work trucks only).
6—Wheeling Traction Company.
7—San Diego Electric Railway.
8—Pennsylvania-Ohio System.
9—Beaver Valley Traction Company.
10—San Antonio Public Service Company.
11—Detroit United Lines.
12—Chicago Surface Lines.
13—Tennessee Electric Power Company.
14—Municipal Railway of San Francisco.
15—Philadelphia Rapid Transit Company.
16—Public Service Railway.
17—Gary Railways.
18—Youngstown Municipal Railway.
19—Grand Rapids Railway.
20—Cincinnati Street Railway.
21—Union Traction Company of Indiana.
22—Milwaukee Electric Railway & Light Company.

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The deduction drawn from the survey is that the most potent reason for the use of an emblem is to better public relations. Nearly all the managers agreed that its use was beneficial in the company's relations with the public. It is not a new scheme to create good will, however, for the San Diego Electric Railway, San Diego, Cal., has used an emblem for twenty years; the Capital Traction Company, Washington, D. C., for more than ten years, and the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., for a number of years.

Economy is another usual reason for employing the emblem. The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for example, uses the symbol because its name is too long to be conveniently displayed on its vehicles. This company formerly used the initials "T.M.E.R.&L. Co.", by which it is still known in its community. Although it has not placed the emblem on all of its cars, R. H. Pinkley, assistant general manager, says that he believes "it impresses both the public and the employees who are operating the cars with the ideal of service, and that the effect will be beneficial for both public and employee relations."

As Edward West, general manager of the Utah Light & Traction Company, Salt Lake City, Utah, points out, if a symbol is used "it is not necessary to reletter a long name when the cars are painted or touched up and varnished." Combinations of both name and emblem are used by some companies, as shown in an accompanying illustration of a Youngstown & Suburban Railway bus. When this is done the advantage of economy is lost, but the advantage of individualizing the service remains.

Many of the railways operating as parts of larger systems, or under managements such as the Byllesby corporation and Stone & Webster, Inc., find the emblem particularly advantageous as a means of identification, linking together several companies under one symbol. A. C. Spurr, general manager Wheeling Traction Company, Wheeling, W. Va., reports that his company uses emblems on all of its equipment, a standard practice throughout the entire West Penn System, of which it is a part. On cars recently painted by this company the name has been omitted as a matter of economy. R. N. Graham, manager of railways Pennsylvania-Ohio System, explains that its symbol includes also the name. On the coaches of the Pennsylvania-Ohio Coach Lines "P. O. Coach Lines" appears on the shield, while for other branches the words "Pennsylvania-Ohio System" are used. On the Youngstown Municipal Railway, operating in Youngstown, Ohio, the letters "Y. M. Ry." appear on the shield of the system named. The Nash-

Emblems Applied by Stencil

23—Pacific Electric Railway (freight equipment only).
24—Capital Traction Company.
25—Scranton Railway.
26—Oklahoma Railway (buses only).
27—Winnipeg Electric Co. (trucks only).
28—Youngstown & Suburban Railway.
29—Evansville & Ohio Valley Railway.
30—Waterloo, Cedar Falls & Northern Railway.
31—Chicago, North Shore & Milwaukee Railroad.
32—Shreveport Railways.
33—Lehigh Valley Transit Company.

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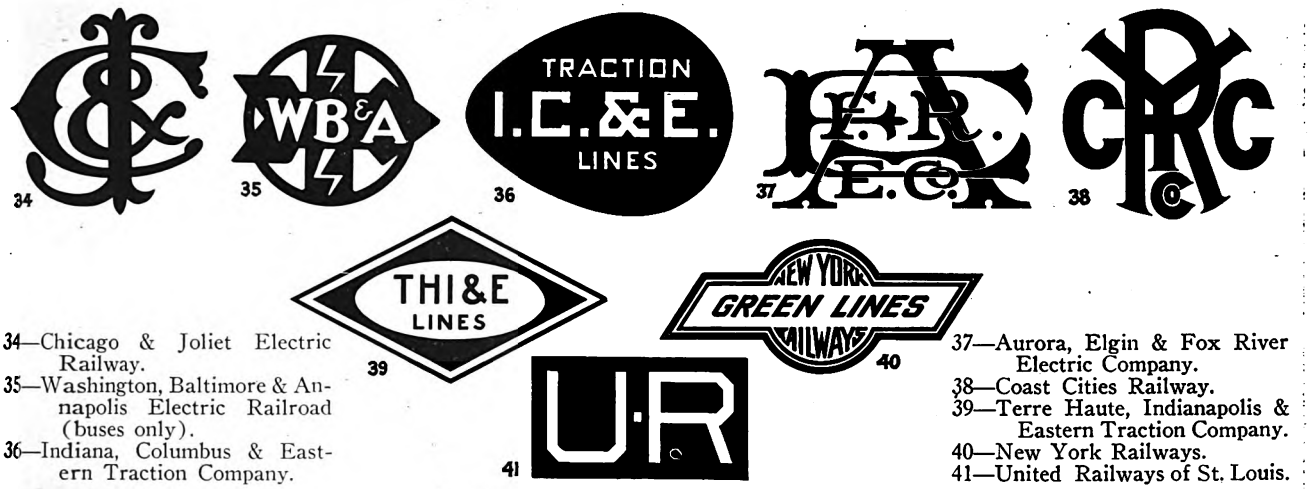

34—Chicago & Joliet Electric Railway.
35—Washington, Baltimore & Annapolis Electric Railroad (buses only).
36—Indiana, Columbus & Eastern Traction Company.
37—Aurora, Elgin & Fox River Electric Company.
38—Coast Cities Railway.
39—Terre Haute, Indianapolis & Eastern Traction Company.
40—New York Railways.
41—United Railways of St. Louis.

Emblems Applied by Hand Painting

ville Railway & Light Company, Nashville, Tenn., uses the emblem of the Tennessee Electric Power Company, Chattanooga, Tenn., on its rolling stock, automobiles and trucks.

Usually the electric railway inherits the name of the city or section which it serves. But the management can individualize it by giving it an emblem. Not only will it stand out in its community in this respect but among other electric railway companies all over the world.

Shapes of Emblems Vary

The 45 emblems used by the railways covered in this survey differ greatly from each other. Some are ornate. Some are plain. Probably the most effective designs are those that tell the story in the simplest way. It may be individualized by the shape and add to its distinction by its color scheme. Gold leaf is effective. It is used in making the monograms of the Lehigh Valley Transit Company, Allentown, Pa., and the Shreveport Railways, Shreveport, La. The Philadelphia Rapid Transit Company, Philadelphia, Pa., uses the plain black letters "P.R.T.," under which appear "Under Mitten Management." The Toronto Transportation Commission capitalizes its monogram, "T.T.C.," in such ways as by use of the emblem on signs erected reading "To the Cars," "To the Coaches."

The circle is a popular type of emblem. It may contain a triangle, as does that of the San Antonio Public Service Company, San Antonio, Tex., which names its sides after its three branches of public service, "Transportation," "Electricity" and "Gas." Within the triangle is the slogan "Service our Mission," displayed above a little picture of the Alamo. The Wheeling Traction Company names the sides "Safety, Service and Speed." The Beaver Valley Traction Company, New Brighton, Pa., is fortunate in being able to select the beaver as the basis of its emblem. It has expanded this idea in its public relations work by pointing out that the beaver symbolizes thrift. Going a step further along this line, the company placed posters with its symbol in a number of the storekeepers' windows as advertising display. Operators in the employ of the Cincinnati Street Railway, Cincinnati, Ohio, wear the symbol of the company on arm bands.

Decalcomania transfer, used by 22 of the 45 companies, has advantages over hand painting or stenciling of emblems on the equipment because it is cheaper where there are a large number of vehicles in service. By this means a colored design, no matter how intricate, may be transferred to the side of the vehicle and lacquered or varnished over. L. M. Zapp, general manager of the Detroit United Lines, Highland Park, Mich., thinks the process is considerably cheaper than either of the others, in which opinion he is joined by 21 other general managers.

But opinions vary concerning its advantages. The Coast Cities Railway, Allenhurst, N. J., does not find a large difference in cost between hand painting and the other processes. The United Railways of St. Louis, Mo., uses the monogram "U.R.," hand painted on the rolling stock in plain black letters. Albert Perkins, manager for the receiver, believes that this method gives a more striking effect than the decalcomania. President Hugh J. Sheeran of the New York Railways, New York City, also believes the hand-painted system more effective. A monogram painted by the stencil process is used by the Scranton Railway, Scranton, Pa., on all of its trucks and service equipment with the exception of the buses, on the sides of which are stenciled the name "Scranton Bus

Emblems Made Separately

42—Key System Transit Company.
43—Utah Light & Traction Company.
44—Market Street Railway.
45—Interstate Street Railway.

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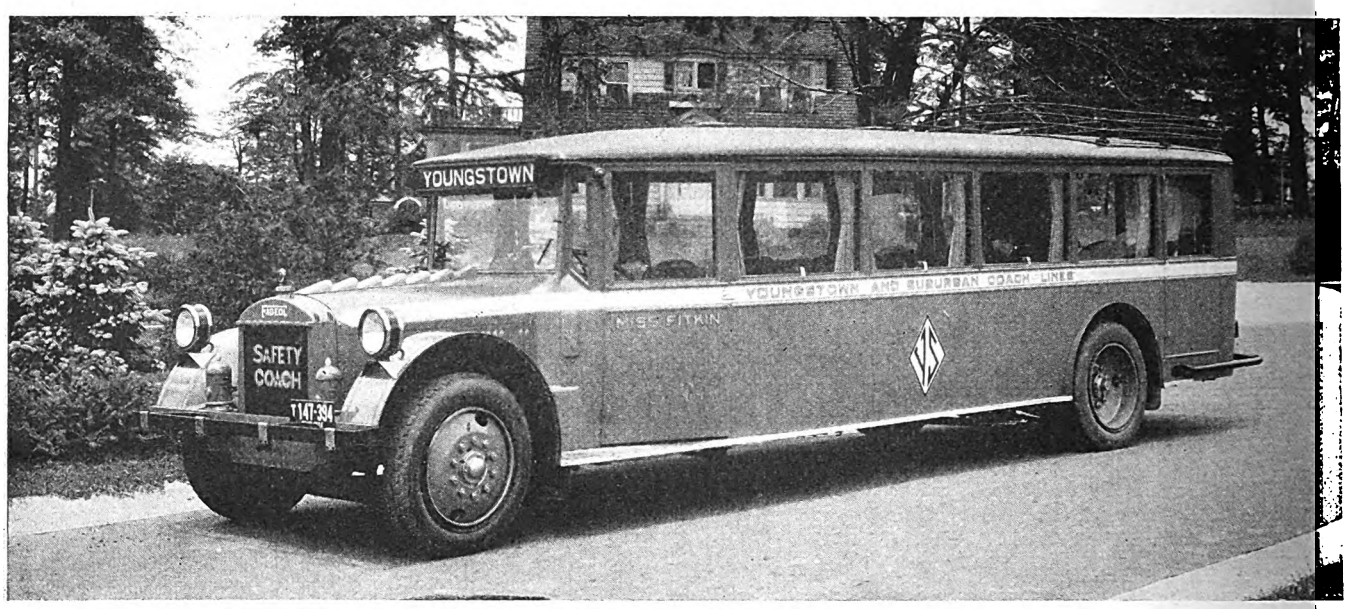

Both name and emblem appear on buses of the Youngstown & Suburban Railway

Company." In all, eleven railways reported the use of stencil for emblems, while eight use hand painting.

Still another way to display an emblem is to screw or rivet metal or enameled shields to the sides of the equipment. While this process is satisfactory from the standpoint of appearance, it is more expensive than the others. Only four companies report the use of this method.

With some railways, the emblem is used on all equipment, both passenger and freight, as well as on posters, stationery and notices sent out by the company. Thus the emblem takes the semblance of the manufacturer's trademark. On the passenger car it is usually placed in the center of the side panel. Buses also use this same location, although frequently it is placed near the entrance at the front of the bus. The United Railways & Electric Company of Baltimore, Md., says A. T. Clark, superintendent of rolling stock and shops, employs a monogram on automotive trucks of the line, the way and rolling stock departments. This is placed on the tailgate and on the panel near the driver's seat. On the body of the truck also appears "United Railways." Only the automobiles and trucks of the Georgia Power Company, Atlanta, Ga., carry the emblem of the company. The Oklahoma Railway, Oklahoma City, Okla., does not use the emblem on its cars, but does apply a stenciled emblem to its buses. This is required by a city ordinance to designate them from those of other operators. The Winnipeg Electric Company, Winnipeg, Canada, uses the emblem on its trucks also.

Slogans and Names Displayed

A few of the companies have adopted slogans, such as "Service with a Smile," used by the Oklahoma Railway, Oklahoma City, Okla., stenciled on the sides of the cars. "Ride More for Less per Ride," was used during the city merchandising campaign in Fort Worth, Tex., explains L. E. Thorne, superintendent of plant of the Northern Texas Traction Company, and also "Ride the Street Cars and Save the Difference," when the same company introduced the nickel pass. But the permanent slogan is "We Appreciate Your Patronage," which is carried on all city cars, placed to the left of the door, and "Speed with Safety," on all limited trains in interurban service. The Kentucky Traction & Terminal Company, Lexington, Ky., has a list of advertisements which appear on wooden signs on the roofs of the cars with inscriptions such as "America's First Railway Air-Magnetic Brake." The last two companies named do not use the emblem.

New Car of Market Street Railway on Exhibition in San Francisco

RECENTLY a new, green leather-upholstered California type street car built in the shops of the Market Street Railway was placed on exhibition for six days on several of San Francisco's busy thoroughfares and was visited by approximately 8,000 people.

Three supersalesmen were on hand to greet the public. They answered all questions and saw that every guest received a copy of "San Francisco by Street Car," an interesting booklet prepared by the company featuring the various places of interest in and around San Francisco and telling just what street cars to take to get there.

This exhibition car was visited by approximately 8,000 people in San Francisco

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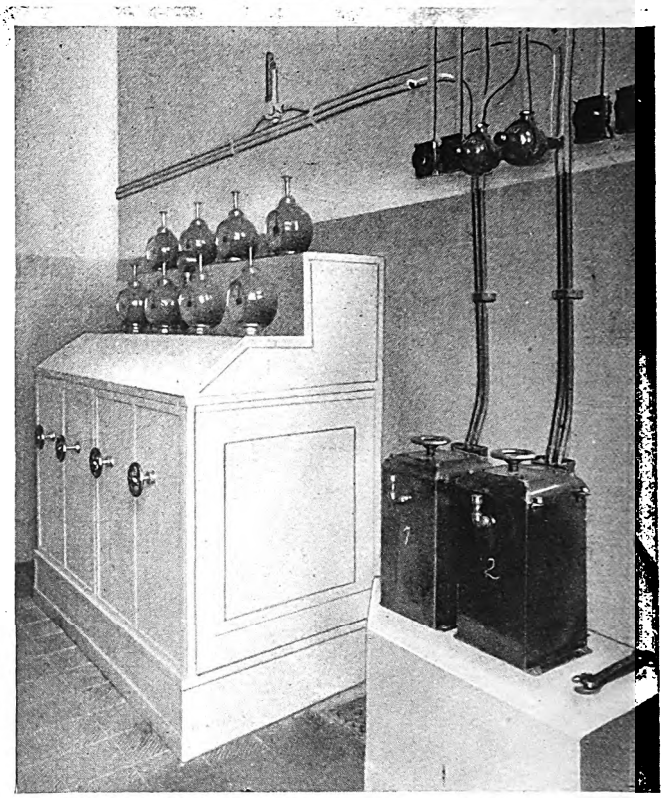
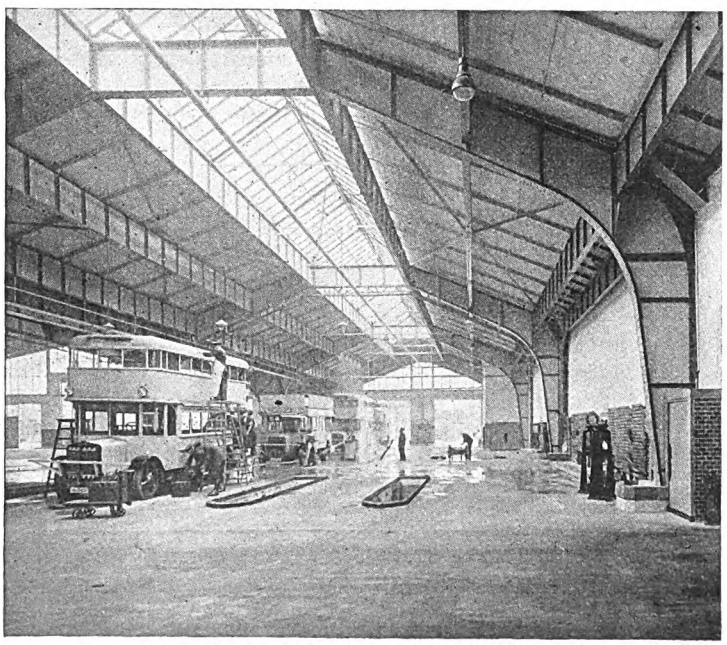
at 10 o'clock these buses, with those arriving later, follow a regular course. In the first place, the interior is cleaned by being swept or mopped out and the upholstery of the seats is "vacuumed." In the second position the buses pass through the washing stand. In this washing machine the spraying pipes for the sides of the bus are in three horizontal rows and are mounted on small wheels so that the position of the stands is adjustable to a certain extent. The stands are supplied by water from above by flexible hose. There is also a spray from above and from the ends. After being thoroughly washed by these sprays, the bus proceeds to the third position, where any lumps of sticky dirt which have remained on the body, chassis or wheels during the spraying process are washed off with water from a hose directed by hand. To economize on water the nozzles on this hand hose have special valves which cut off the water two seconds after the nozzle has been released by the hand of the employee engaged in washing. In the fourth position the bus is dried and polished.

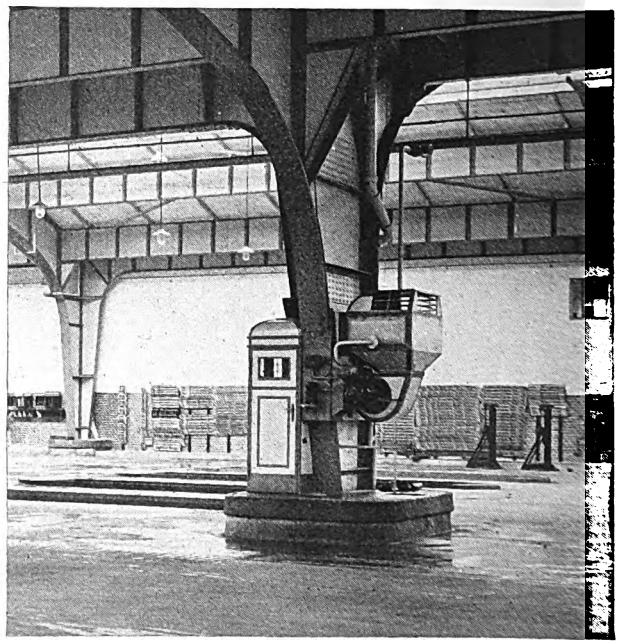


All gasoline taken at filling station is carefully measured by these instruments

Buses are charged at this filling station from overhead pipes



At left, the washing and inspection as seen from the repair pits. and base protected by wooden



At right, column for roof with hot air heater and telephone booth curb against sideswiping of bus

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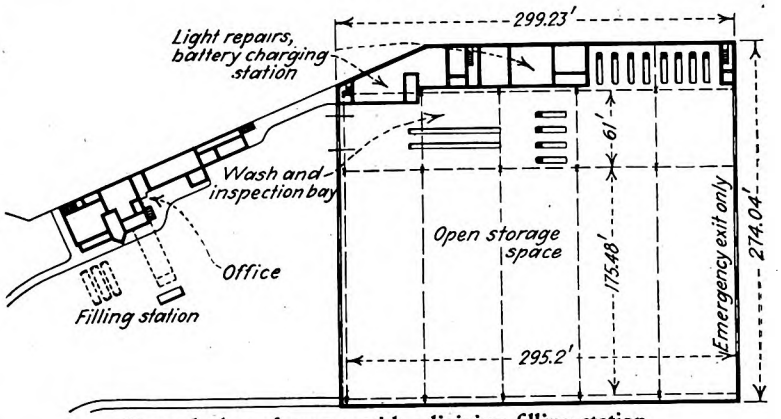
In winter the water used for washing is kept at a constant comfortable temperature by an automatic heat regulator. The washing process takes three minutes in all.

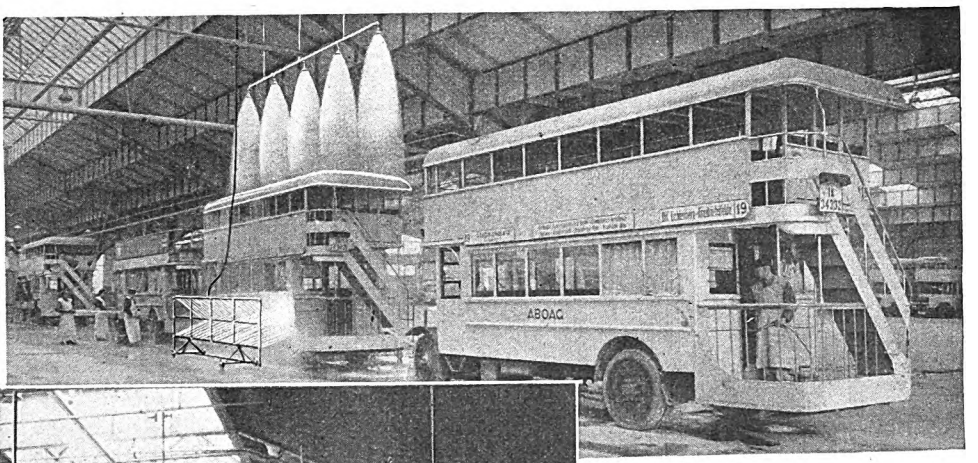
Drains under the washing stand are arranged to trap the dirt before the water flows off into the sewer.

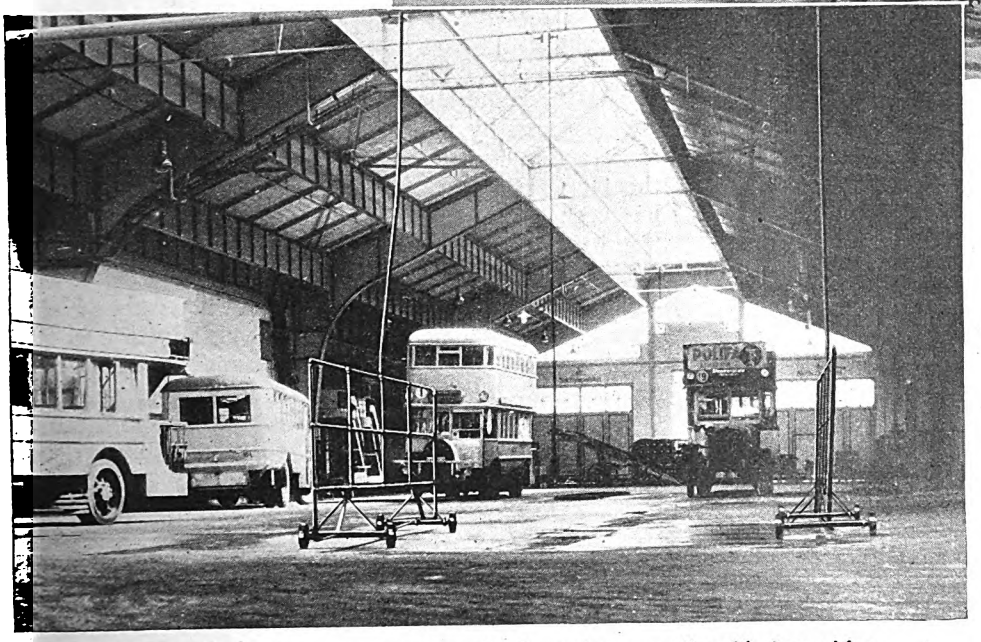
From the washing stand the bus goes to the inspection pits, where it remains about twelve minutes. During this time the buses are greased from below while the batteries are being changed, the spark plugs examined and the oil reservoir for the motor is being filled from above from a portable oil tank, which measures the oil put in each bus. This inspection and change of batteries are done to each bus daily. The inspection pits are lighted and heated as well as fitted with electric power sockets and compressed air connections. They are connected with each other and with the repair pits by an underground passage so that any material needed can easily be brought to the pit workers.

One of the illustrations on page 388 shows a near-by view of these inspection pits. On the right of the pillar in the foreground is a blower forming part of the general steam and hot air heating system of the garage. On the left of the pillar is a telephone booth. The view also shows the oak protecting curb which has been built around the bases of the pillars to prevent any sidewiping or endwiping of them by a bus.



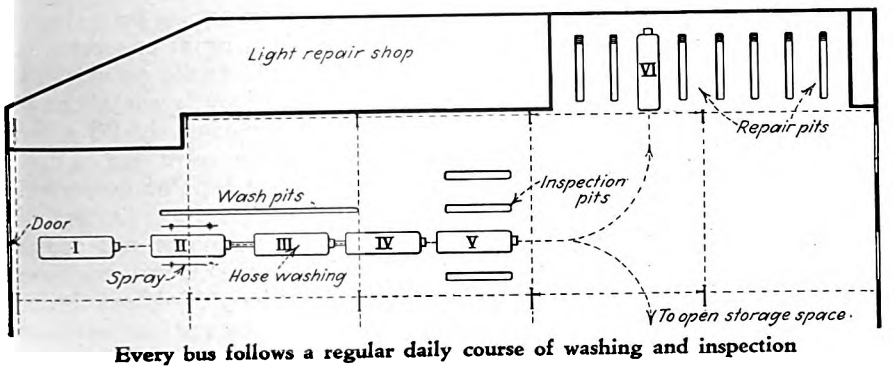
General plan of garage with adjoining filling station





The daily cleaning and inspection includes (1) vacuuming the inside, (2) spray washing, (3) hose washing, (4) inspection

The spraying racks are mounted on wheels so they are adjustable in position. They are connected to the water supply above by flexible hose



Every bus follows a regular daily course of washing and inspection

The examination of every bus at the inspection pit determines whether it shall go to the operating or south side of the garage, ready for service, or to the repair pits on the north side.

Fire protection for the garage is supplied by a sprinkler system as well as by the provision of a number of chemical extinguishers and sand pails.

The filling station is in a separate building some distance away from the garage, for fire protection purposes, and is of an uncommon type in

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that the filling pipes are supported on an overhead structure or bridge. Before adopting this design the management considered the two more common methods of post connection and side wall connection for filling stations, but adopted the overhead plan as more compact and rapid, since it permits two buses to be charged with 100 liters (26½ gal.) of gasoline each in a minute. The plan adopted is held equally safe from a fire standpoint.

The main supply of gas is stored in three underground tanks adjoining the outer support or pillar of the bridge. Each of these tanks has a capacity of 60,000 liters (16,000 gal.). Gasoline is brought to these tanks in the company's own 50,000-liter tank wagons, which are weighed on scales adjoining the bridge support before and after they discharge their contents into the underground reservoir. They can do this while standing on the scales.

From these underground tanks the gasoline is forced by electrically driven centrifugal pumps through a self-cleaning filter. The piping system is so arranged that gasoline can be drawn from any one of the three under-

The company has five of these tank wagons for taking gasoline from the railroad tanks to the garage charging stations

ground tanks and can be pumped from any one of these tanks to any other. After leaving the filter the gasoline passes through a set of meters to the three sets of charging pipes. Each of these consists of two pipes, one of 40 mm. (1½ in.) diameter and one of half that diameter. The larger one is used until the tank on the bus is nearly full, then it is shut off and the pipe of smaller diameter is employed. There is a separate meter on each pipe to give more accurate measurement of the amount taken. With a flow capacity in each set of pipes of 135 liters (35½ gal.) a minute, a capacity of each bus tank of 100 liters (26½ gal.) and three sets of charging pipes it will be seen that buses can be charged easily at the rate of 30 seconds each. When the filling of a bus is completed the charging hose is hauled out of the way. In addition, there is a small tap on the supporting pillar of the bridge for use in drawing gasoline for miscellaneous or emergency purposes.

Thermometers are arranged both in the measuring room and on the bridge, so that if the gasoline reaches a temperature thought dangerous all pumping is automatically stopped and a warning given. At all places where there is a possibility of drip there are gutters to catch the gasoline and carry it to an underground chamber, where it is pumped by hand through a filter and saved.

The standard bus of the Berlin General Omnibus Company has two decks, usually with the upper deck inclosed, four wheels and solid tires. Operating expenses about the first of this year were 33.5 cents per bus-mile. One six-wheel bus has recently been built for trial. The company has five garages.

Kansas City's Track Rehabilitation Program

REHABILITATION of the Kansas City Public Service Company requires about 25 miles of track replacement and several new bridges. This work will necessitate the use of thousands of tons of rock, which the company has decided to mine itself. A shaft was sunk and new equipment has been installed which will produce 500 cu.yd. of rock daily. For transporting and handling materials, two Differential motor cars, five trailers and one derrick have been added.

With 120,600 ft. of single track to be completed within a year, the problem of excavating 374,999 cu.yd. of material was solved through the purchase of an Insley excavator. This machine will do the work of from 25 to 30 men and will effect considerable economy.

Another addition to the equipment is a 21E Rex paver, capable of laying 700 to 800 ft. of single track a day. This machine is equipped with automatic water control, batch meter and timing device.

To work in conjunction with the paver, two Haiss power loaders have been purchased. These machines are used for loading sand and rock. With this equipment six to eight men can handle all materials to the paver. The loaders are equipped with strike-off batch hoppers that insure a more consistent mixture and, hence, a better grade of concrete.

To break out old concrete ahead of the power excavator two large portable air compressors, capable of handling six paving breakers each, have been added to the new equipment. There are 315 miles of track in Kansas City and about one-twelfth of it will be torn up and replaced by modern tracks and new paving. The construction department has been reorganized to carry on this work, at a cost of approximately $1,000,000. Much has been done to minimize the cost of track rehabilitation by the purchase of new modern machinery and equipment.

This trackwork is progressing at the rate of about 1 mile per week. All material purchased outside of Kansas City, such as rails, steel ties and accessories, are stocked ahead of requirements. However, the larger bulk of the material consists of sand, stone and cement.

The company's cement cars go to a mill at Bonner Springs, Kan., and haul the cement direct to the job on which it is to be used. The sand supply is handled in the same way.

The type of track construction selected is considered the most modern yet designed, consisting of International steel ties and 90-lb. rails imbedded in a solid slab of concrete 13½ in. thick. Only two kinds of material are used, steel and concrete. No ballast, wood ties, asphalt, granite or brick paving are used, as in other types of track construction. The type of track now being torn up consisted of wood ties on ballast, or in concrete, 7-in. rail, tie plates, screw spikes and granite paving. The cost of this type per lineal foot of track was about $13, as compared with a cost of approximately $8 a lineal foot of the new track. The difference in cost is due to various factors: First, the present type of construction calls for less excavation and still gives ample depth for the track structure; second, the section of rail adopted, although about the same weight as the old rail, costs much less per ton, being standard section; third, granite paving is very expensive and is not necessary for the present-day rubber-tired vehicles.

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Designing Vehicles to

Sell Rides

By J. H. Lucas
General Superintendent of Rolling Stock
The Milwaukee Electric Railway & Light Company

The following article is taken from an address before the Transportation Section of the Wisconsin Utilities Association at its summer meeting, held at Milwaukee on Aug. 18-19. *All of the pictures were furnished by the author in illustration of the points he makes in the course of the address.*

WITH Joliet, Ill., and Springfield, Mass., bringing out cars like buses and the automobile manufacturers producing buses resembling street cars, we can well afford to devote some time to the consideration of current trends and objectives. It is an encouraging sign for all of us to note the activity throughout the country in providing new equipment, new cars and new buses. And operators all make old equipment more comfortable and attractive. The private auto and the bus have brought new ideas into the transportation field and our car and bus equipment must keep pace or preferably do better.

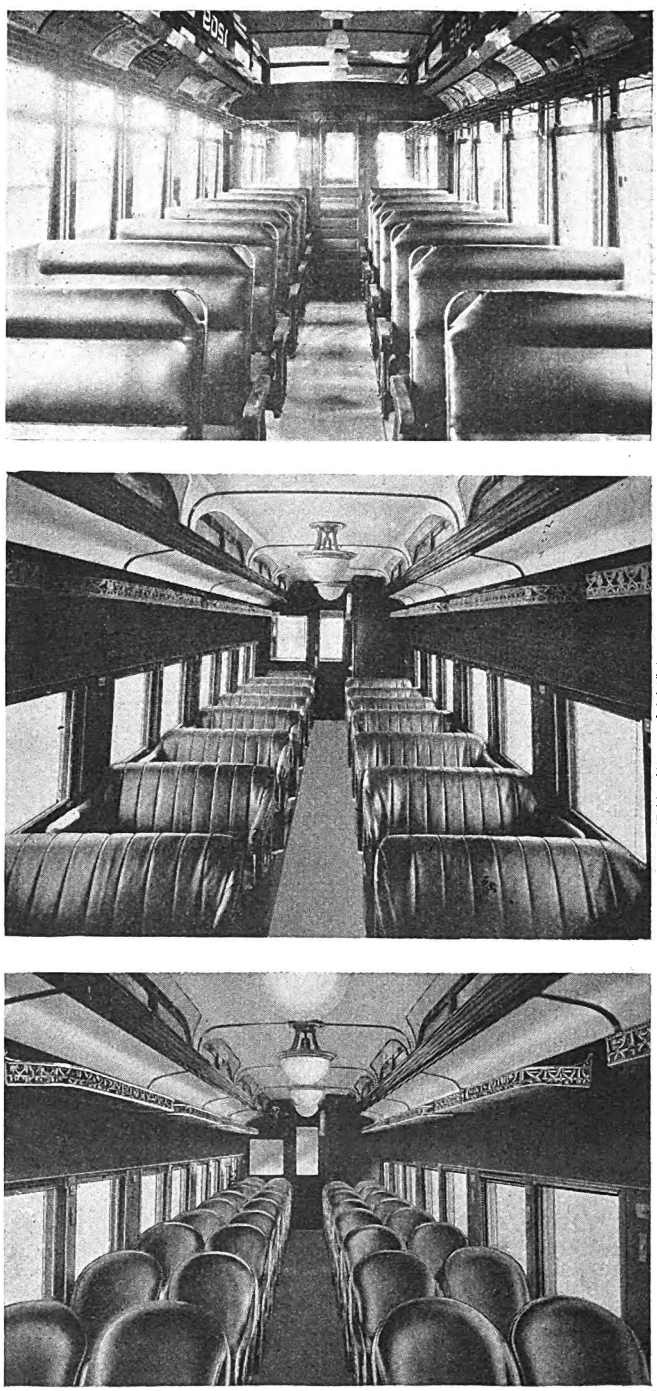
The motor bus builders are good advertisers. Glance at one manufacturer's prospectus and see if it offers anything of value. "The ruggedly built body of the P.D.Q. bus will give years of service. The side panels are padded to prevent road noises and windows which slide in grooves of felt are non-rattling. This car is designed to provide superlative comfort. Deep lounging seats, wide aisles, unobstructed vision, adequate ventilation and quiet operation insure utmost comfort." "Abundant power and speed." "Special heavy duty rear axle and with special springs and balloon tires. This parlor car rides with rail-like smoothness." Note that!

They go on to say that "equipment is complete and includes front and rear bumpers, etc.—and on the dash, grouped under glass, artistically arranged and indirectly lighted, are the instruments—speedometer, ammeter, oil gage, gas gage, thermometer, eight-day clock, etc." "The long low lines of the body blend gracefully into the cowl and hood, and at the rear an ornamental grille work and awning accentuate the luxurious impression."

There's a whole barrelfull of ideas. As a matter of fact, the co-ordination of car and bus design has already made great progress. We have adopted bus ideas to rail car use, and while we can take more, the reverse is also true, i.e., bus designers have used and can use more rail experience and principles to advantage. Speed, comfort and attractiveness are stressed as of major importance in modern transportation vehicles.

In this day speed is primarily important, and we are finding that our electric railway has some advantages. For example, consider our own interurban lines running out of Milwaukee. When paralleling concrete roads were laid a few years ago, the competitive buses were able to take their small load through traffic and into the country more quickly than the rail cars. By a change in route we were able to get onto our own right-of-way in ten minutes, eliminating a long drag through city streets. With motors geared up to 65 to 70 m.p.h., private autos and buses cannot equal our time and we are getting a healthy increase in the interurban business. This particular instance depended for success on other matters beside improved car design, and is a good example of the absolute necessity of doing everything to increase speed.

In city service, likewise, speed must be the first consideration of car and bus design. High acceleration rates are essential, and where $1\frac{1}{2}$ to $1\frac{3}{4}$ m.p.h. per second used



Development of Interurban Car Seats and Interior Finish

At top, high back seats, 1922; center, sedan-type seats, improved lighting and finish, 1924; below, individual de luxe seats, 1926.

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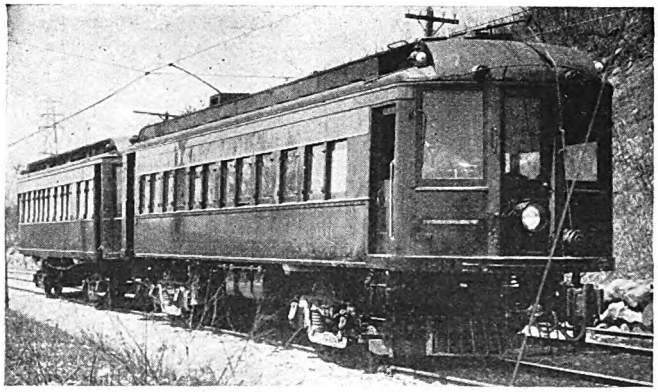
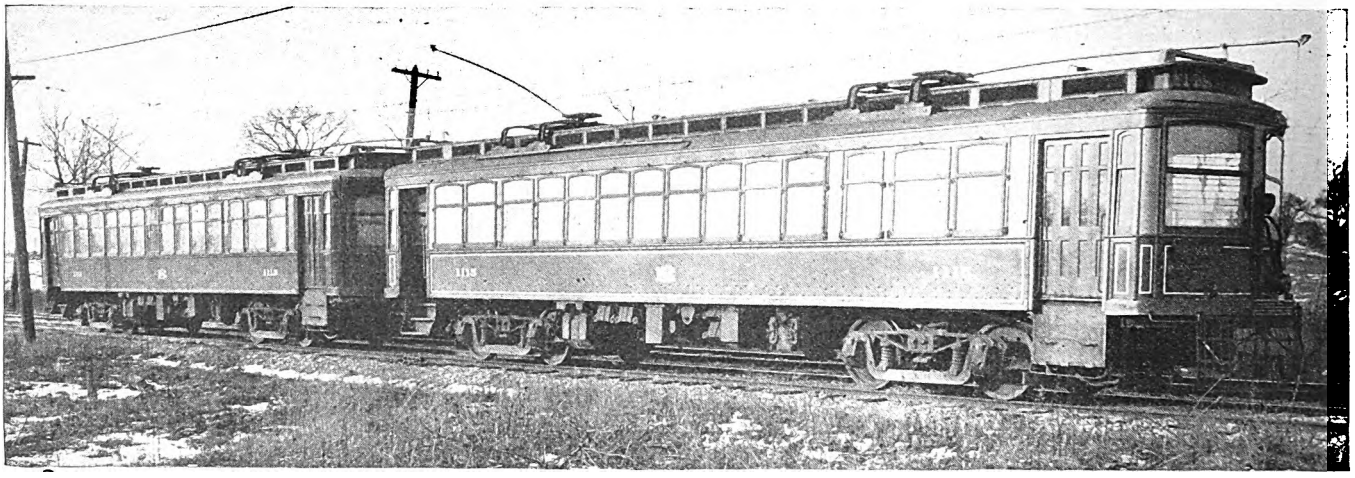
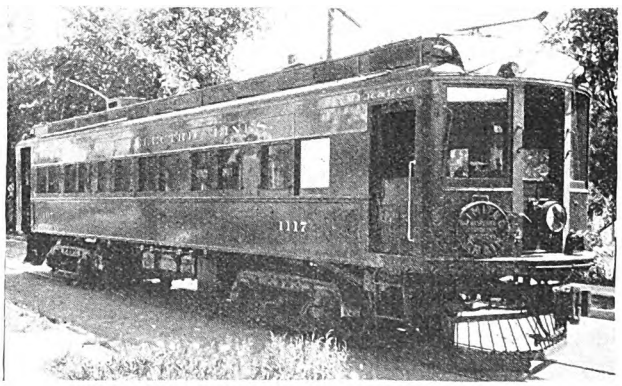
to be considered good, 3 m.p.h. per second is now thought desirable. This necessitates larger motor capacity or higher-speed motors with steeper gear ratios. The possibility of using 6 or 7 to 1 worm gears is one of the things that make the automotive type axle a possibility for car use.

The bus, too, must provide more power for pep and speed. The original four-cylinder engines furnished with the first buses we bought are too small today. In fact, it is pretty generally realized that the six-cylinder bus costs no more to operate and gives better speed and comfort. Gas consumption with the six is practically the same as with the four in equal service, as gears are shifted less frequently. Less gear shifting speeds schedules considerably in city operation, and the greater proportion of time operating in high gear provides more comfort for passengers. The latest product of the bus builders' art employs two motors per car to provide ample power for speed, thus copying electric car practice and further emphasizinng the co-ordination in design.



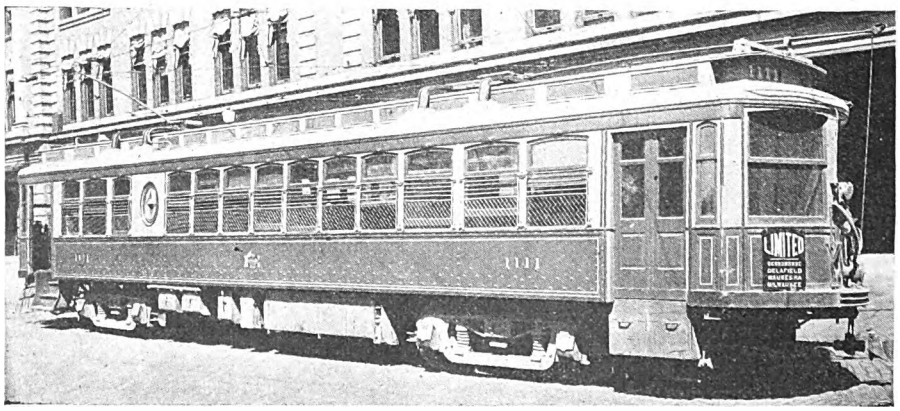
As a further aid to speed, we must consider the use of anti-friction bearings. Many of us tested anti-friction bearings under cars years ago, and past experience somewhat prejudiced our opinion. Roller bearings today are so much improved that they again merit consideration for the possibility of better acceleration, if for no other reason.





Possibility of improvement in braking also must be given thought. With higher speeds for all vehicles we must specify the best possible brakes for safety. Various types of power brakes are being tried out on buses. Whether the automotive type of braking apparatus that is being tested under street cars is going to be an improvement over our old standard of cast-iron shoes bearing directly on the wheels remains to be seen. It is significant to note that metal to metal brakes are being used to some extent on the buses.

When we consider comfort, we find that the bus and automobile have assisted in one of the outstanding improvements of recent cars, the change in seats. For years our best offering in a car seat used fairly stiff



Improving Body Lines of Interurban Cars

A single car of the old type is shown at the right. Immediately above is a similar car after rebuilding.

The views at the top show two-car trains of the old and new types, indicating how improved lines have been obtained.

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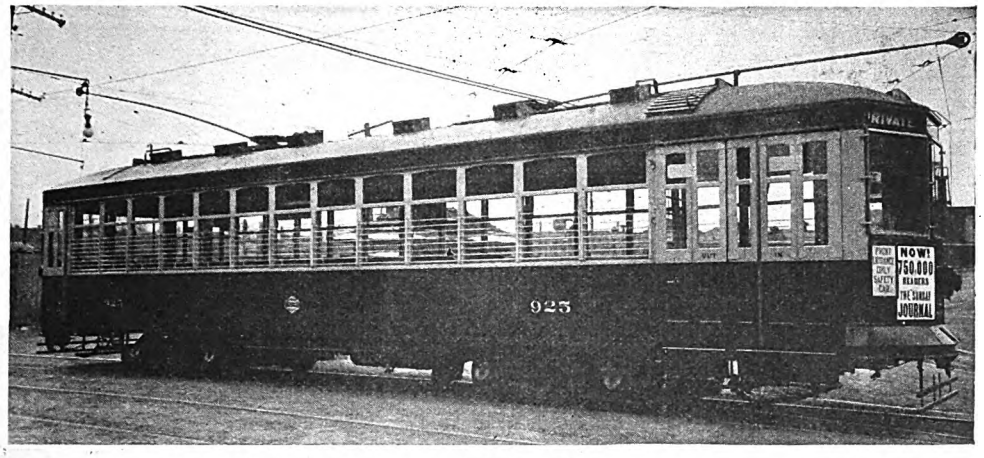
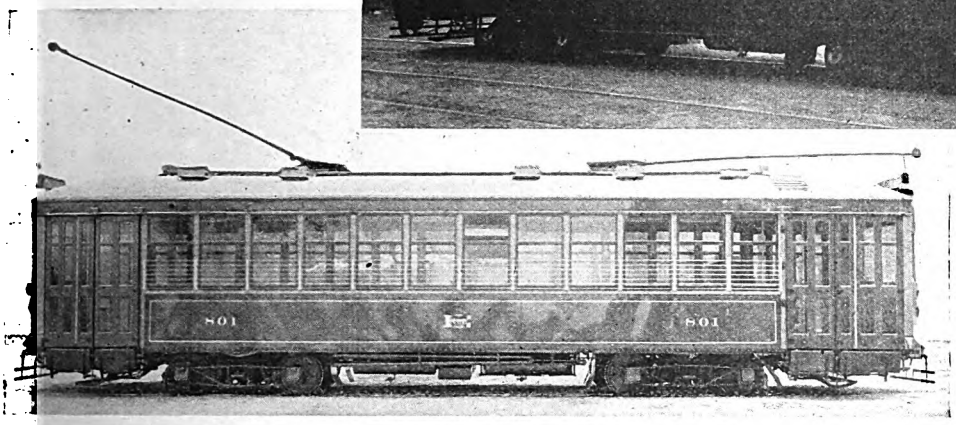
springs and a reversible back, which was straight across and not at all form-fitting. The sedan bus brought the automobile seat and the so-called parlor bus the soft upholstered individual chair, which have proved a most popular addition to our interurban equipment. Nine out





Above—Streamline effect obtained through two-color paint scheme. At left—Old-style single color system of painting on the same series of cars

of ten passengers, asked concerning their impression of our interurban improvements, mention "those seats," so it is easy to know where to stand on the seating question.

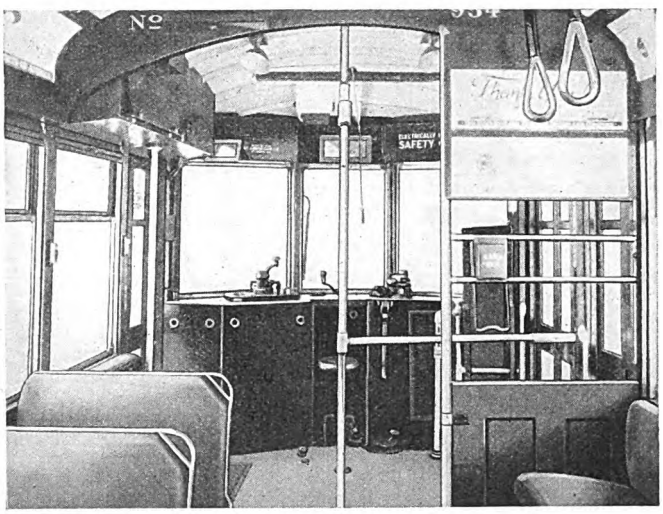
It is out of the question and unnecessary to consider the use of this type of seats in city cars and buses, but for this short ride service the use of fabric or other upholstery than the old standard rattan has made some favorable impression. This may be a passing fad and really has more to do with appearance than comfort.

Other features contributing to comfort are light, heat and ventilation, the elimination of noise and improved riding qualities. The bus does not offer as much with respect to the first three as the rail car does and the relative advantage of noise and ease of carriage is open to question. Lighting is one of the cheapest items. We can well afford to have cars and buses well lighted, so that passengers can read in comfort and cars will appear attractive. Bus fixtures particularly need improvement. All parts of electrical apparatus on a bus are too small and flimsy and bus makers can co-ordinate to considerable advantage by using standard car wiring connections, etc., which admittedly would be oversize, but which would nevertheless give less trouble and failures in service.

Bus heating systems also must be improved if we are to maintain equal warmth for comfort in a bus as we have in cars. Steam and hot water heat for buses are experimental. We have in Milwaukee the first double-deck bus in the world to have heat in the upper story. This is steam heat. One advantage of steam is that you can use ¼-in. copper tubing for body radiator connections and eliminate the large sized exhaust pipes from the floor and inside of the bus. Steam also minimizes the fire hazard.

Ventilation of buses can be improved by following interurban car practice and providing for positive inlet of fresh air. A great deal of complaint of car sickness and nausea can be avoided by proper ventilation in both car and bus.

Quietness and ease of riding are two qualities contributing to comfort that to a certain extent go hand in hand. For a time it was suggested that the automotive



An inclosed cabinet conceals controller and piping, making for a clean platform

vehicle had an inherent advantage because it rode on rubber tires, and we heard a lot of talk concerning the "rubber urge." Now, as in the advertisement quoted earlier, the bus is stressing operation "with rail-like smoothness." Noise is a sign of wasted energy and poor design. Rubber is an excellent absorber of sound, and if we cannot use it in our wheels we at least should employ it to deaden metal-to-metal contacts where annoying noise is produced. Rubber-cushioned wheels have not been successful because the space in which rubber can be inserted in a car wheel is too limited. If we ever come to a cushion wheel for rail cars it will be something other than rubber, possibly the old pressed-paper center wheel such as was used under Pullman cars years ago.

The bus, however, features rubber spring shackles and engine mountings. This points out some advantageous applications on cars. Rubber pads under center bearings have been used and the report on noise research presented before this convention last year indicated that this installation has accomplished something. Rubber washers at drawbar anchorages and rubber hose around

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A modern bus that has been designed with street car appearance

brake rod supports quiet little knocks that are noticed and complained of by the passenger. Other sound-absorbing materials are available for eliminating noise, squeaks and rattles from bus and car and all such deserve consideration.

Reduction of noise is presumed to be an important feature of the automotive type axle with its worm gear as used under the Joliet and Springfield cars. We may not fancy this particular type of axle with its differential, but we cannot ignore the possibilities of the worm gear on this one count alone. We can get other types of worm gears to go on our standard axle, and from such experience as we have had in our buses, i.e., quiet operation and low maintenance, I would be inclined to try some if the cost were anywhere within reason.

Good roadway and track maintenance affects riding results and noise to a degree that is of equal importance to all that we can do in vehicle design. Up-to-date car trucks with ample wheelbase and proper spring proportions will please our passengers more than the older models can with the same track conditions, but any car rides poorly on rough track just as any bus or automobile does on a rough road. With increased speed, both tracks and trucks must be given more attention.

In a resolution adopted at the December meeting, the equipment committee of the A.E.R.E.A. recognized the need of more attractive rolling stock. This problem concerns not only the design and evolution of new rolling stock, but also includes the changing of existing cars and buses to modernize them and to increase the passenger sales value of the equipment. Competition cannot be met with cars that are the same today as twenty years ago. While all of the old cars cannot be scrapped, they can at least have a change in color of paint and it is surprising how much attention and favorable comment such a relatively small expenditure will bring.

The automotive people have learned to accentuate "streamline effects" with paint. We can undoubtedly use this thought in repainting cars as well as in new construction. Contrasting colors on upper and lower body panels with the judicious use of striping unquestionably adds to the appearance of any car and is much more pleasing than one solid color. I would not suggest consulting an artist when you pick a color scheme for rolling stock. Bright, attractive combinations of the reds, yellows and greens with cream or ivory are very effective on a public conveyance, although they may jar the sensibilities of one who has been educated to values of the more refined tints and subdued shades. The bus builders have led in the adoption of lacquer finishes, and there is no doubt that this material has splendid wearing qualities on metal surfaces. Lacquer for wood may be developed, but there seem to be more possibilities in the adoption of metal covering for all exterior parts so that we can use the present materials. Metal doors and sash are being produced with this in view.

In the Springfield cars the body builders imitated bus design in the windshield effect of the motorman's window. Whether we need to go this far in co-ordinating design is again a question. Personally, I do not think that the automobile or bus with its engine hood sticking out in front is much better looking than our standard car. The "Twin Coach" adopts street car appearance and conceals its motors under the body to produce a fairly good looking job.

On the inside of the car, however, we can take a tip from the bus and arrange our control equipment more neatly. On older cars we have a mess of pipes, valves, a homely controller, door-operating shaft, fare box stands, etc., that collect dust and dirt, old newspapers and transfer punchings; overhead a miscellaneous array of switches and wires. On new equipment, it costs little more to specify simple cabinet inclosures for this equipment, which contribute substantially to good appearance and are easy to keep clean. If old cars are being converted for one-man operation, a little thought and money spent on this feature will be well worth while.

Soldiers Transported on Buses of Boston "El"

BUSES of the Boston Elevated Railway carried nearly 1,500 men to Camp Devens for their summer encampment on July 9. Fifty-nine buses, each containing approximately 25 men, with their equipment, were mobilized in four groups for this purpose.

Two state constabulary officers on motorcycles went with each group, one leading and setting the pace at about 20 miles per hour, the other guarding the rear from interference. The "L" furnished nearly one-half of all the buses engaged in this troop movement, the total involved being about 125.

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Readers' Forum

Methods of Improving Quality of Rails

WILKINSBURG, PA., Aug. 23, 1927.

To the Editor:

Efforts to secure a quality of rail that will have longer life have been made principally in two directions. One has been the use of increasingly harder steels; i.e., of higher carbon content, ranging up to about 1 per cent. The result, however, has been disappointing. While a steel of such high carbon content is much harder than mild or semi-mild steel, it is also much more brittle and considerably greater care as to quality becomes necessary. The use of alloy steels has not as yet met with any degree of success. If they are used simply in the "as rolled" condition nickel or nickel-chromium steels offer little advantage over straight carbon steels. Manganese steel shows exceptional resistance to wear and proves successful in rail junctions and crossings, but it is too costly for use as ordinary rails.

The second line of effort for the improvement of rails has been an attempt to secure perfectly sound and homogeneous steel free from blowholes, non-metallic material and segregation. For trial purposes special rails have been ordered to stringent specifications in regard to homogeneity. The production of steel to meet such requirements, however, entails so wide a departure from ordinary rail production practice that the cost becomes excessive. The desirability of "sound steel" for rails from the point of view of safety cannot be denied, and it is a problem to be faced by the steel maker how to produce a better quality of steel, more suited to modern requirements of speeds and loads, without an excessive increase in cost.

Meanwhile, a third method of improving rail quality is receiving increasing attention, viz., the application of heat treatment. This is by no means a novel idea, as it was suggested and tried many years ago. The great advantage to be gained by the use of heat treatment is that it is possible to combine considerable surface hardness with great toughness and considerable ductility in the body of the rail and to use a steel of medium carbon content. There is, however, a serious consideration which may, perhaps, account for the limited employment of the heat-treated rail. No amount of heat treatment can get rid of the defects and dangers associated with unsound steel; in fact, it is more than doubtful whether it is wise to apply such treatment to steel which is segregated, contaminated with non-metallic inclusions or interspersed with blowholes. Indeed, since internal defects are likely to cause cracking during quenching operation, the heat treatment of steel of relatively low grade may do more harm than good.

The application of heat treatment to rail steel has again been taken up in France at the Neuve-Maisons works of the Compagnie des Forges de Chatillon. Like previous heat-treatment processes applied to rails, the aim is to harden and temper the steel of the head only, by a partial quenching, which leaves the heat from the rest of the rail, flowing into the head after quenching, to effect the right degree of tempering. The novel feature of the method employed at the French works is the way the quenching of the head is carried out. For this purpose the hot rail is pushed into a long frame, in which it is held head down over the long quenching bath. The quenching process consists in making the quenching water come into contact with the rail head for a brief period several times in succession. In order to regulate the severity of the quenching effect a limited amount of water is used, so that the quenching water rapidly comes to the boil. Boiling water has very little quenching effect, and by this means an almost automatic compensation is brought about for differences in the temperatures of successive rails as they are brought to treatment. The hotter rail raises the quenching water to the boiling point more rapidly and thus compensates for what would otherwise be a more severe quenching effect.

There can be no doubt that carefully controlled heat treatment of this kind must produce markedly beneficial results on rails made of medium hard steel of good quality. Hardness and abrasion tests carried out at the French works speak strongly in favor of the heat-treated material, as is to be expected. Whether or not the treatment will justify itself in practice remains to be seen. As suggested above, it must depend to a very large extent upon the general quality of the steel to which the process is applied. Although good steel can be markedly improved by the right heat treatment, the best of heat treatment cannot cure an unsound steel.

JAMES SILBERSTEIN,
Metallurgical Engineer.

Push the Button and Learn the Shortest Route

Intending passengers on London tramways can learn by pushing a button the route to take to any desired point

DEVICES known as "pathfinders" have been installed by the London County Council Tramways at two or three important traffic points on its system. The device consists of a large map of the L. C. C. tramway lines, supported vertically in a frame with a row of some 40 push buttons on each side. Opposite each push button is the name of an important traffic point on the system, with the number of the car route which a passenger must take from the location of the "pathfinder" to reach that point.

If any intending passenger wishes to know the direction and streets covered by that route, he has only to push the button opposite his desired destination. This lights a row of miniature electric lights behind the map, showing the route to be followed.

The accompanying illustration shows one of these "pathfinders" of the L. C. C. tramways at its Westminster Bridge waiting station. An intending passenger is shown in the act of pushing a button.

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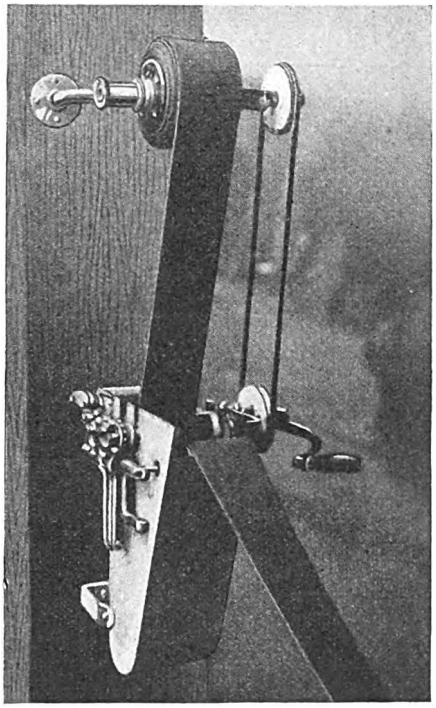
Maintenance Methods and Devices

Canvas Hose Run Through Vat and Wringer

INSULATING compound is applied to the canvas hose used in covering conductor cables on cars of the Dallas Railway & Terminal Company, Dallas, Tex., by a home-made vat, clothes wringer and winding reel. This small but important piece of apparatus is mounted on one of the roof-supporting posts of the shop. Its use enables the coating of 100-ft. lengths of the 2-in. diameter canvas hose in a little less than ten minutes. It replaces the former process of painting with the canvas stretched out on the floor. The vat is "V"-shaped, of sufficient width to accommodate the hose. A sheave at the bottom of the tank guides the hose through the insulating compound, while an abbreviated clothes wringer at the top serves not only to pull the hose through the tank but also to squeeze out excess compound and thoroughly to impregnate the fabric. A reel mounted above the vat is driven positively by a spring belt and pulley operated from the crankshaft of the wringer. In operation, the hose is laid out on the floor in line with the apparatus. It is fed through the lower sheave and up through the wringer rollers. The vat is filled with the insulating compound and the end of the hose is then carried up and attached to the winding reel. It is only necessary then for the operator to turn the crank of the wringer and the entire length of hose is treated without further attention.



Apparatus used in the shop of the Dallas Railway & Terminal Company for treating canvas hose used in protecting cables mounted in cars. It consists of an abbreviated clothes wringer, reel and vat. Ten minutes are required to treat a 100-ft. length

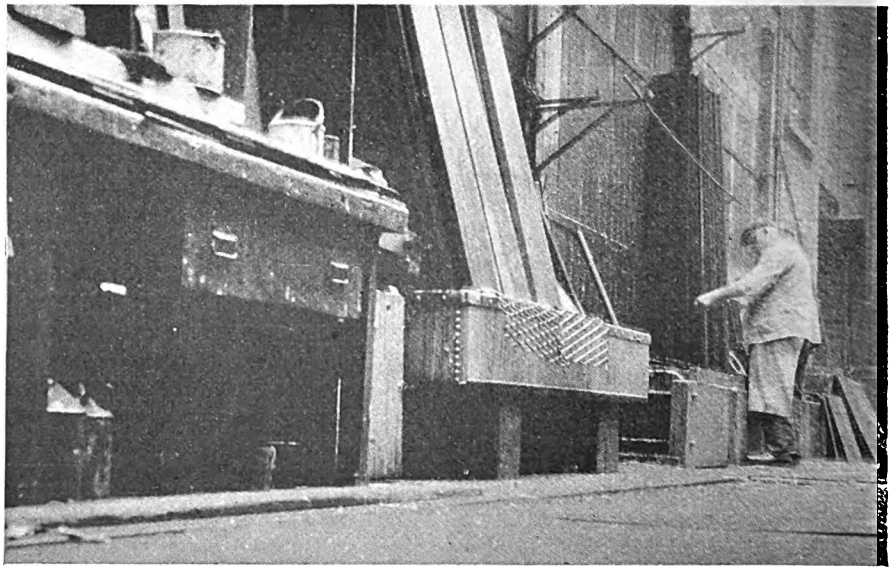
Spray and Dip Painting in London

SPRAY and dip painting are used extensively by the electric railway and bus companies in London, England. In the shops of the London County Council Tramways several rooms, one of which is illustrated, have been partitioned off for spray painting with good facilities for exhausting the waste paint vapors. Temporary partitions are used at present, but later it is expected that permanent rooms for spray painting will be provided.

The room is lighted by two rows of lamps on each side. Each wall has sockets for holding the brackets of the painters' scaffolding. In the view published a row of such brackets are shown above the first cross girder, so that the scaffolding can be used for painting the upper deck of the car. Steam heat is used to assist the drying process and the room is well ventilated from above as well as by exhaust pipes which extend down the walls on each side. Cars are both painted and varnished by the spray process in this room, which is long enough to hold several cars. It is the company's practice once a year to give each car a coat of color and one of varnish. The old paint is rubbed down but not burned off.

The system has several small chambers, 4 ft. high and 4 ft. to 6 ft. wide for spray painting small parts. They look somewhat like dry goods boxes with the front end open. The rear of each of these boxes is fitted

Spray painting of cars on the London County Council system is done in individual chambers provided with steam heating and exhaust systems



Car parts in London suitable for one color jobs are dipped into paint tanks. Varnish is also applied in the same way

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with an exhaust pipe for removing the unused spray.

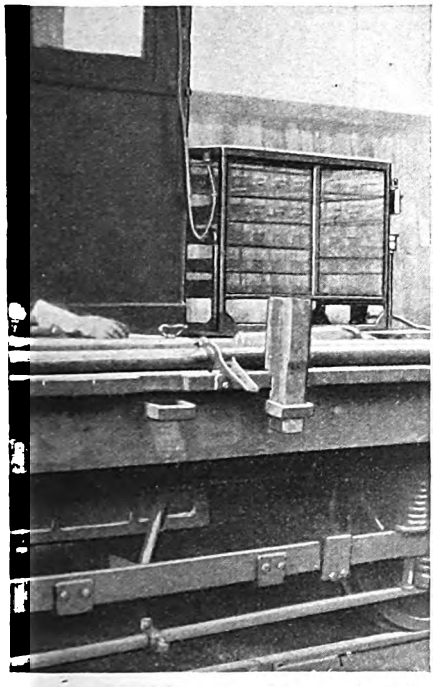
All car parts which can be finished in one color are dip painted rather than sprayed. This applied to parts like life guards, floor mats, long lining boards and gear cases, which, on the London County Council Tramways, are of wood. Some of the dip tanks used for this purpose are 20 ft. or more in length to accommodate the longer pieces. Those parts which need a coat of varnish later are dipped in similar varnish tanks after their paint has dried. A view of one of the dipping rooms is given in the second illustration.

Many a car's downfall is the result of a poor overhaul.

Convenient Method of Carrying Welding Equipment

By M. Spitz
Gary & Southern Traction Company, Crown Point, Ind.

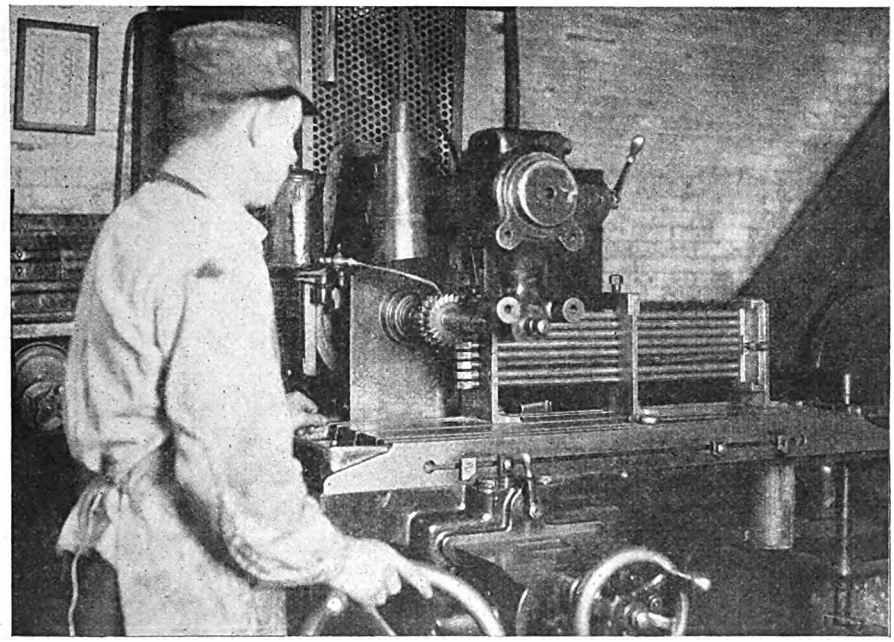
EQUIPMENT for bond welding is carried on a motor car by the Gary & Southern Traction Company, Crown Point, Ind. The welder is connected to the trolley base of the



Method of carrying and connecting welding equipment on a car of the Gary & Southern Traction Company

car, so a separate pole is not needed to connect the welder to the trolley wire. This speeds up the work so that in eight hours 224 bonds were welded to the rail. A total of 2,200 Una bonds have been welded in this manner in a short interval.

Fixture for Milling Square Ends on Rods



Convenient fixture for milling the square ends on elevated gate bars

GATE bars for the elevated cars of the Brooklyn - Manhattan Transit Corporation, Brooklyn, N. Y., are square at both ends. The faces of the square portion must be in the same plane for the two ends of the bar. In order to provide for accurate work in making these bars and also to provide for milling a quantity of them at one time a fixture shown in the accompanying illustration is used.

The fixture consists of three uprights which are fastened to the table of the milling machine and which provide for clamping eight bars. When the squares at one end are milled, these fit into a plate with square holes at the opposite end of the fixture so as to hold the surfaces in alignment while the other ends of the bars are milled. Accurate alignment of the faces results.

Monthly Contest Still Open

EYES of all contestants in Electric Railway Journal's Maintenance Competition are now turned toward the Convention Issue, which will be published on Sept. 17 and will contain an announcement of the winners of the Capital Prizes and the August monthly winner. The winning articles will be published also. The material received has been of such a valuable nature that it has been decided to add a fourth capital prize to the other three for the maintenance article that receives honorable mention by the judges. The list of capital prizes now is: first, $200; second, $100, third, $50, and honorable mention, $25.

Contest Still Running

Competition for the monthly prizes of $25 each still continues and many additional articles are being received. Each of the articles received up to April 30, 1928, will have a chance of winning one of the monthly prizes and, in addition, $5 will be paid for each item published whether it receives a prize or not.

Contest Conditions

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Manuscripts should be mailed to the editor of Electric Railway Journal, Tenth Avenue at 36th Street, New York, N.Y. To be eligible for the monthly prizes manuscripts will be received until April 30, 1928.
7. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
8. Details of the conditions not given will be found in Electric Railway Journal for April 16, pages 700-701.

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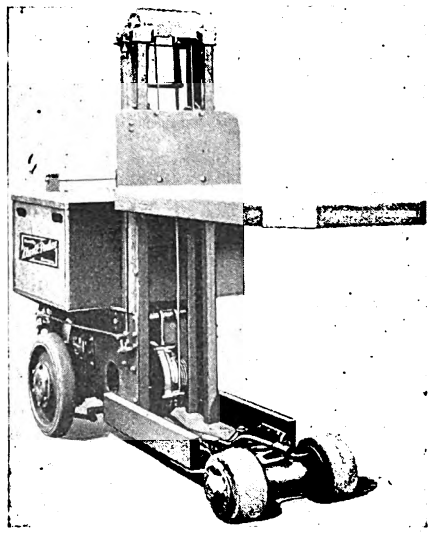
New Equipment Available

Light-Duty Elevating Platform Truck

HANDLING of skid loads or delivering and receiving goods to motor trucks or electric cars is the purpose of a new light-duty electric tiering truck added to the line being marketed by the Elwell-Parker Electric Company, Cleveland, Ohio. It will elevate a load from the floor to a maximum height of 8 ft.

The truck is of all-steel construction and is built on the interchangeable parts basis. The power plant is



New type elevating platform electric truck

of unit type, which includes an Elwell-Parker motor, steel brake drum, steel multi-thread Brown & Sharpe worm, chrome-vanadium drive shafts and universal joints to permit steering and the delivery of power to the steel clutch plates bolted to the outside of the drive wheels. Solid rubber tires are provided.

The operator's pedals, one for brake and the other for controller reverse drum, trip to off position when the pedal is raised and are provided with a heel rest with a non-slip surface. The pedals are spring folded when the operator leaves the truck. The braking and power are actuated separately to provide for incline operation.

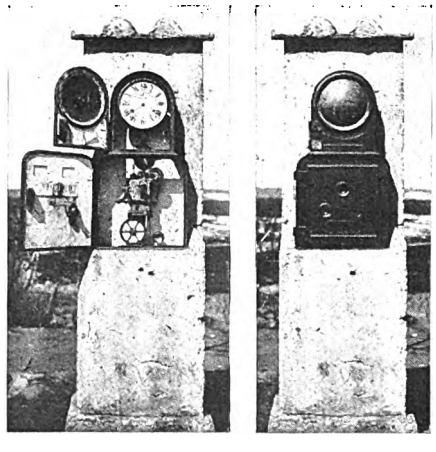
The platform is a solid plate of steel with edges bent to form a deep skirt and with heavy angles welded down the middle for attachment to steel support arms. Each arm carries two long rollers which bear on heavy section channel uprights fitted with a track.

The main frame is built of angles, channels and heavy gusset plates. The battery compartment, with removable sides, will accommodate practically any size battery the service may require, and still the truck is narrow enough and short enough to turn in narrow aisles. The steering mechanism is of the ball-and-socket type. This machine is a high-speed tool and is built with various height lifts and several sizes of platforms.

Rome Headway Recorder

TWELVE headway recorders of the type shown in the accompanying illustrations are in use on the Rome Municipal Tramways. They were designed by Romolo Remotti, superintendent of transportation of the system. One of these recorders was put in service about two years ago and proved so satisfactory that eleven others have been installed during the past twelve months. They are operated by the motorman or conductor.

When a car reaches a recorder, the operator stops, inserts a key, turns it first in one keyhole and then in another, then returns to the car. This takes less than twenty seconds and leaves a record of the time and of the key number. So as not to delay the service, the recorders are placed at points where a stop of at least twenty seconds would be made in any event, as at a terminus or at a near-by street intersection. They are not used in the center of the city, but it is believed as good results are secured as if recorders were also in the busy sections. Even when at or near a terminal, registrations are made on both the inbound and outbound trips.



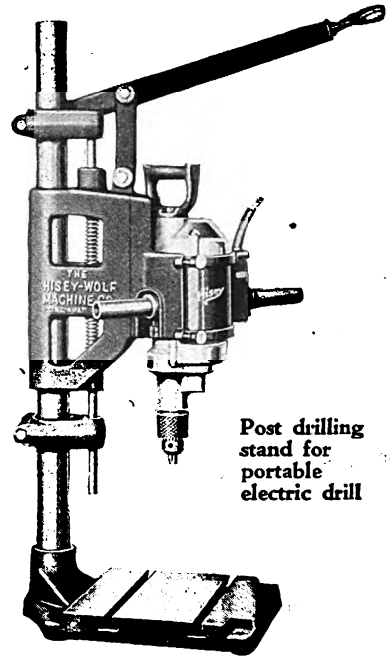
This headway recorder is used in Rome; at left, open; at right, closed

The purpose of the two keyholes mentioned is to prevent dust and other foreign bodies from getting into the working part of the recorder.

When the registrations from this recorder are tabulated or plotted they clearly indicate any irregularities in the running time.

Stands for Electric Drills

FOR post, wall or bench mounting a line of new stands for Hisey electric drills has been designed by the Hisey-Wolf Machine Company, Cincinnati, Ohio. These stands are made for sizes of electric drills from $\frac{1}{4}$ in. to $\frac{7}{8}$ in. capacity and are designed



Post drilling stand for portable electric drill

so that the portable drills can be attached without removing parts of the machine. The supporting bracket and electric drill housing are machined accurately on each end to insure perfect alignment of the drill in the stand.

Improved Aluminum Arrester

VOLTAGE per cell has been reduced, thus affording longer life, in an improved lightning arrester introduced by the General Electric Company for direct-current railway service. The new type of cells, with balancing resistances direct connected, can be substituted easily in the boxes in place of units now in service. Although these improved arresters have just been put on the market, they have been tested thoroughly on railway properties operating in localities where lightning conditions are unusually severe.

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American Association News

Convention Program Shows Many Changes from Last Year

Round table luncheon conferences for executives, group meetings for the engineers, and additional time for inspection of exhibits, among the features

MANY changes have been made in the arrangements for the 46th annual convention of the American Electric Railway Association, to be held in Cleveland, Ohio, from Oct. 1 to Oct. 7. The program, just released by the association, shows that much thought has been put on the problem of getting the greatest value out of the time at the disposal of the delegates.

The exhibits will open at noon of Saturday, Oct. 1. As in previous years meetings of the American Association will be held in the mornings and those of the affiliated associations in the afternoons on Monday, Tuesday and Thursday, Oct. 3, 4 and 6. Wednesday will be set aside for inspection of the exhibits, as has been the practice for the past two years. A new feature this year will be the conference luncheons on specific topics, which have been referred to in previous issues of this paper.

Meetings of the American Association and those of the Transportation & Traffic Association will be held in the Auditorium Annex. This is the same room in which these associations held their meetings last year. The Tuesday evening meeting under the auspices of the Advisory Council will be held in the main ball room on the Arena floor of the Auditorium. Meetings of the Engineering Association, the Accountants' Association and the Claims Association will be held in newly arranged rooms in the lower floor of the Auditorium building. The Tuesday sessions of the Engineering Association will be held in four groups, the principal subjects being Way and Structures, Rolling Stock, Purchases and Stores, and Power. There will be a joint meeting of the Claims Association and the Transportation & Traffic Association on Tuesday afternoon. The round table luncheon conferences will be held in private dining rooms of the local hotels, those on Tuesday being at the Hotel Hollenden and those on Wednesday at the Hotel Cleveland. The larger conference scheduled for Thursday will be held at the Hotel Statler.

The complete program, revised to Sept. 2, follows:

AMERICAN ASSOCIATION

Monday Morning, Oct. 3

WELCOME—W. R. Hopkins, City Manager, City of Cleveland.

PRESIDENT'S ADDRESS.

COMMITTEE REPORTS.

ADDRESS—Dr. A. H. Wishart, pastor First Baptist Church, Grand Rapids, Mich.; a talk on what the public expects and how the railways can please.

ADDRESS—Dr. Miller McClintock, head of The Albert Russell Erkine Bureau for Street Traffic Research, Harvard University; a talk on street traffic control and electric railway operation.

Tuesday Morning, Oct. 4

REPORT OF COMMITTEE ON NOMINATIONS—J. N. Shannahan, chairman.

ELECTION OF OFFICERS.

ADDRESS—M. H. Aylesworth, president National Broadcasting Company, New York; a talk on leadership in the utility field.

ADDRESS—George E. Frazer, Frazer & Torbet, certified public accountants, Chicago; a talk on financial structure.

ADDRESS—Merle Thorpe, editor *The Nation's Business,* Washington, D. C.; a discussion of the manifold contacts of the federal government with business.

ADDRESS—Hon. Wm. W. Potter, attorney general of the state of Michigan; some observations on commission regulation.

REPORT OF COMMITTEE ON CONSTITUTION AND BY-LAWS—C. D. Emmons, chairman.

Round Table Luncheon Conferences, Hotel Hollenden, 1 to 2.30 P.M.

No. 1. Traffic Regulation—H. B. Flowers, sponsor.

No. 2. Taxes—Leslie Vickers, sponsor.

No. 3. The Motor Bus—L. H. Palmer, sponsor.

No. 4. The Trend in Franchises—L. R. Nash, sponsor.

No. 5. Developing Sales Instinct in Platform Employees—G. H. Clifford, sponsor.

No. 6. Advertising—to Increase Riding; to Improve Public Relations.

Tuesday Evening, Oct. 4

ADVISORY COUNCIL NIGHT—B. C. Cobb, chairman of Advisory Council, presiding.

CLEVELAND MALE CHORUS.

ADDRESS—B. C. Cobb, New York.

SOLO—Miss Anna Case of the Metropolitan Opera Company.

ADDRESS—Hon. George B. Cortelyou, president Consolidated Gas Company, New York, and chairman Joint Committee of National Utility Associations.

SOLO—Miss Anna Case.

PRESENTATION OF CHARLES A. COFFIN FOUNDATION AWARD.

SOLO—Miss Anna Case.

DANCING UNTIL 1 A.M.

Wednesday, Oct. 5

EXHIBIT INSPECTION DAY. There will be no formal sessions.

Round Table Luncheon Conferences, Hotel Cleveland, 1 to 2.30 P.M.

No. 7. Cars—What Is Being Done and Results—L. J. DeLamarter, sponsor.

No. 8. The Problem of Financing.

No. 9. Public Relations—T. Fitzgerald, sponsor.

No. 10. Bringing City Service Up to Date.

No. 11. The Valuation Question—Walter A. Draper, sponsor.

No. 12. Trend of Fares—F. W. Doolittle, sponsor.

No. 13. Employee Relations—Britton I. Budd, sponsor.

Thursday Morning, Oct. 6

ADDRESS—E. F. Wickwire, chairman committee on co-operation of manufacturers.

SYMPOSIUM—"How the Industry is Progressing." Five-minute talks by operating executives relating the feature accomplishments of the year on properties in different parts of the country. Questions which will be asked and answered are as follows:

Does aggressive property-wide rehabilitation pay?

How are you arranging service and publicity to secure an additional passenger per car mile?

How have you reduced pull-ins to one in 600,000 miles and how have you reduced equipment maintenance costs to 2 cents per car mile?

How have you reduced overhead line breaks to one in 58 days?

What are the facts about your ability to operate at same cost per mile as prior to the war?

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How have you inspired platform men with greater interest in their jobs?

With very low population per mile of track, how have you made your system pay?

How have you sold the public on the railway?

How have you robbed the junk man of your interurban and made it a profitable property?

How are you meeting the transportation needs of your community?

How have you made a 300 per cent increase in revenue?

How did you change an unprofitable bus operation to a highly profitable one?

What has been your experience with de luxe service in a large city?

ADDRESS—Francis H. Sisson, vice-president Guaranty Trust Company, New York; a discussion of factors that affect the market for electric railway securities.

INSTALLATION OF OFFICERS.

Round Table Luncheon Conference, Hotel Statler, 1 P.M.

No. 14. Opportunities and Prospects for the Interurban. Dr. Thomas Conway, Jr., sponsor.

ACCOUNTANTS' ASSOCIATION

Monday Afternoon, Oct. 3

ADDRESS OF PRESIDENT.

REPORT OF EXECUTIVE COMMITTEE.

REPORT OF SECRETARY-TREASURER.

APPOINTMENT OF COMMITTEE ON NOMINATIONS.

REPORT OF COMMITTEE REPRESENTING THE ACCOUNTANTS' ASSOCIATION AT THE ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS—W. L. Davis, auditor Lehigh Valley Transit Company, Allentown, Pa., chairman.

Discussion.

REPORT OF COMMITTEE ON BUS ACCOUNTING—M. W. Glover, general auditor West Penn Railways, Pittsburgh, Pa., chairman.

Discussion.

REPORT OF THE COMMITTEE ON STANDARD CLASSIFICATION OF ACCOUNTS—M. W. Glover, general auditor West Penn Railways, Pittsburgh, Pa., chairman.

Discussion.

PAPER—"Public Service Regulation—Effect on Accounting Practice"—Harry Boggs, certified accountant, Indianapolis, Ind.

Discussion.

Tuesday Afternoon, Oct. 4

REPORT OF COMMITTEE TO REVIEW THE PROCEEDINGS OF THE ACCOUNTANTS' ASSOCIATION—J. E. Heberle, assistant to the president Capital Traction Company, Washington, D. C., chairman.

Discussion.

REPORT OF THE COMMITTEE ON FARE COLLECTION—E. A. Tuson, general auditor Public Service Railway, Newark, N. J., chairman.

Discussion.

PAPER—"Combating the Present Day Criminal." This talk will deal especially with conditions as they exist in street railway auditing departments. W. L. Barnhardt, resident vice-president National Surety Company, New York.

Discussion.

Wednesday, Oct. 5

EXHIBIT DAY—There will be no formal meeting except that a get-together luncheon at 12:30 p.m. will be arranged. The details of this will be announced later.

Thursday, Oct. 6

REPORT OF THE COMMITTEE ON GRAPHS—C. R. Mahan, comptroller Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., chairman.

Discussion.

REPORT OF THE COMMITTEE ON STORES ACCOUNTING—R. A. Weston, special accountant The Connecticut Company, New Haven, Conn., chairman.

Discussion.

PAPER—"Passenger Revenue Auditing and Accounting"—Horace L. Howell, Meyer & Wenthe, Chicago, Ill.

Discussion.

REPORT OF COMMITTEE ON NOMINATIONS.

ELECTION OF OFFICERS.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST-PRESIDENT'S BADGE.

INFORMAL ROUND TABLE OF ACCOUNTING MATTERS.

CLAIMS ASSOCIATION

Monday Afternoon, Oct. 3

PAPER—"Proposed Uniform Traffic Regulation.—Its Advantages, including the ability of the Hoover Conference Recommendation."—R. A. Sears, general claims attorney, Boston Elevated Railway.

PREPARED DISCUSSION BY

J. J. K. Caskie, supervisor of claims Philadelphia Rapid Transit Company.

Frank J. Gatrell, general claim agent Chicago Surface Lines.

Discussion by a traffic officer on "Advantages of National Uniformity in Traffic Rules."

GENERAL DISCUSSION.

Tuesday Afternoon, Oct. 4

JOINT SESSION WITH TRANSPORTATION AND TRAFFIC ASSOCIATION.

REPORT OF JOINT COMMITTEE ON TRAFFIC AND SAFETY—H. K. Bennett and C. H. Evenson, co-chairmen.

PREPARED DISCUSSION.

GENERAL DISCUSSION.

REPORT OF COMMITTEE ON BONUS AND AWARD SYSTEMS — G. T. Hellmuth, chairman.

PREPARED DISCUSSION.

GENERAL DISCUSSION.

ADDRESS—"Work of National Safety Council"—James P. Barnes president, Louisville Railway, Louisville, Ky.

GENERAL DISCUSSION.

Wednesday, Oct. 5

No formal meetings to be held on this day, which has been set aside for inspection of exhibits. An informal luncheon meeting, however, of Claims men has been arranged. At this meeting "Uncle Red," well-known safety engineer, will give one of his characteristic radio talks.

ROUND TABLE DISCUSSION.

Thursday Afternoon, Oct. 6

SYMPOSIUM ON CLAIMS SUBJECTS:

P. W. Klabunde, acting claim agent Milwaukee Electric Railway & Light Company.

J. C. de Sautels, acting general claim agent Montreal Tramways.

Walter Robinson, claim agent Cincinnati Street Railway.

Bert C. Wood, general claim agent Pennsylvania-Ohio Electric Company, Youngstown, Ohio.

Augustus Baker, adjustment department Pittsburgh Railways.

D. A. Finkbeiner, claims attorney Community Traction Company, Toledo, Ohio.

J. W. Giltner, general claim agent Northern Ohio Power & Light Company, Akron, Ohio.

REPORT OF MEDICAL AND SURGICAL COMMITTEE—Dr. W. M. Holtz, Pittsburgh Railways.

PAPER—"The Claimant's Doctor—How May He Be Convinced of the Company's Fairness, and How May the Company Maintain His Friendly Cooperation?"—Dr. Hart E. Fisher, chief surgeon Chicago Rapid Transit Company.

PAPER—"Should the Company Doctor Attend the Injured Claimant?"—Ernest W. Miller, M.D., Milwaukee, Wis.

PAPER—"Should All Accidents Have Medical Investigation and if so, What Information Is Helpful to the Adjuster?"—H. M. Bascom, M.D., Illinois Power & Light Corporation.

PAPER—"The Company Doctor and Litigation"—Value of his examination prior to and his testimony at time of trial—Benjamin E. Sibley, M.D., Boston Elevated Railway.

PAPER—"The Company Doctor and Litigation"—How can he help to nullify the unfavorable effect of the professional medical witness?—John A. Leeming, M.D., Medical Counsel, Chicago Surface Lines.

OPEN FORUM—One-half hour for discussion of any medical problems that may be presented from the floor.

GENERAL DISCUSSION.

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ENGINEERING ASSOCIATION

Monday Afternoon, Oct. 3

GENERAL MEETING

ADDRESS OF THE PRESIDENT.

REPORT OF THE EXECUTIVE COMMITTEE.

REPORT OF THE SECRETARY-TREASURER.

REPORT OF COMMITTEE ON NOMINATIONS.

ELECTION OF OFFICERS.

PAPER — "Track Construction and Maintenance Economies"—F. B. Walker, chief engineer, Eastern Massachusetts Street Railway.

PREPARED DISCUSSIONS—Five minutes each.

GENERAL DISCUSSION.

PAPER—"Economies Obtained with Modern Cars"—W. R. McRae, superintendent rolling steel stock and shops, Toronto Transportation Commission.

PREPARED DISCUSSION—Five minutes each.

GENERAL DISCUSSION.

PAPER—"Automatic Substation economies."

PREPARED DISCUSSION—Five minutes each.

GENERAL DISCUSSION.

Tuesday Afternoon, Oct. 4

WAY AND STRUCTURES DIVISION

H. H. George, Chairman, Presiding
W. W. Wysor, Sponsor

REPORT OF STANDING COMMITTEE ON WAY AND STRUCTURES—H. H. George.

Review of Manual—W. R. Dunham, Jr.

Special Trackwork—E. M. T. Ryder.

Arc Welding Processes and Welding Rod Specification—C. F. Gailor.

Alloy Steels Other Than Managanese for Special Trackwork—A. T. Spencer.

Light Section Girder Rails—C. A. Alden.

Rail Corrugation—W. W. Wysor.

Relative Advantages of 7-In. and 9-In. Girder Rails—H. F. Merker.

Effect of Modern Vehicular Traffic on Paving in Track Area—A. E. Harvey.

Bus Garage Design—R. McKay.

Track Ballast and Drainage—S. C. Baker.

Track Checking Gage—C. H. Clark.

Car House and Shop Construction and Wiring Regulations—H. E. Bachman.

Track Construction Specifications—C. L. Hawkins.

Joint Railway and Bus Terminals.

REPORT OF WOOD PRESERVATION COMMITTEE.—C. A. Smith.

REFORT OF WELDED RAIL JOINT COMMITTEE.—E. M. T. Ryder.

ROLLING STOCK DIVISION

A. T. Clark, Chairman, Presiding
P. V. C. See, Sponsor

REPORT OF ROLLING STOCK COMMITTEE—A. T. Clark.

Review of Manual—C. W. Squier.

Motor Coach Design—V. W. Berry.

Modern Cars—H. S. Williams.

Car Lighting—R. W. Cost.

Roller Bearings—W. C. Bolt.

Lubrication—W. G. Stuck.

Suction Strainers for Air Compressors —J. C. McCune.

Motor Brushes—Side Wear.

Noise Reduction in Car Operation—H. S. Williams.

Gearing—F. J. Foote.

Current Collecting Devices—H. Savage.

Journal Boxes—W. B. Adams.

Limits of Wear—J. M. Bosenbury.

REPORT OF COMMITTEE ON UNIFICATION OF CAR DESIGN—H. H. Adams.

REPORT OF COMMITTEE ON HEAVY ELECTRIC TRACTION—H. F. Brown.

PURCHASES AND STORES DIVISION

J. Fleming, Chairman, Presiding

ADDRESS—Daniel Durie.

ADDRESS—J. G. Barry.

ADDRESS—B. J. Yungbluth.

REPORT OF COMMITTEE ON PURCHASES AND STORES.

Manual Review.

Unused Inactive Materials.

Practices in Testing.

PAPER — "Some Phases of Stores Practice"—W. E. Scott.

POWER DIVISION

F. McVittie and W. E. Bryan, Presiding
L. D. Bale and C. H. Jones, Sponsors

REPORT OF COMMITTEE ON POWER TRANSMISSION AND DISTRIBUTION—F. McVittie.

Manual Review.

Catenary Construction and Materials.

Trolley Wire Wear.

Trolley Wire Specifications.

Radio Interference.

Trolley Wire Reels.

Distribution Layout for Automatic Substations.

Standards for Comparison of Operating and Maintenance Results.

REPORT OF COMMITTEE ON POWER GENERATION AND CONVERSION—W. E. Bryan.

Manual Review—C. W. Saathoff.

Ventilation of Substations—F. W. Peters.

Mercury Arc Power Rectifiers— G. I. Wright.

Economical Trolley Potential for Congested Areas—R. L. Weber.

Thursday Afternoon, Oct. 6

GENERAL MEETING

PAPER—"Trends in Motor Coach Engineering."

PREPARED DISCUSSION—Five minutes each.

GENERAL DISCUSSION.

PAPER—"Maintenance of a Large Overhead System" — M. W. Cooke, superintendent power and incline, Pittsburgh Railways.

PREPARED DISCUSSION—Five minutes each.

GENERAL DISCUSSION.

PAPER—"General Aspect of Commercial Aviation"—R. H. Horton, former vice-president, Philadelphia Rapid Transit Air Service and formerly director air transport survey of the Department of Commerce, Washington, D. C.

GENERAL DISCUSSION.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST-PRESIDENT'S BADGE.

NEW BUSINESS.

TRANSPORTATION AND TRAFFIC ASSOCIATION

Monday Afternoon, Oct. 3

ADDRESS OF PRESIDENT.

REPORT OF EXECUTIVE COMMITTEE.

REPORT OF SECRETARY-TREASURER.

APPOINTMENT OF CONVENTION COMMITTEE ON RESOLUTIONS.

REPORT OF COMMITTEE ON NOMINATIONS.

ELECTION OF OFFICERS.

REPORT OF COMMITTEE ON BUS OPERATION—R. N. Graham, chairman.

Discussion.

BUS OPERATORS' SCHOOL—A demonstration of the school of the Northern Ohio Power & Light Company for the training of operators.

Discussion.

Tuesday Afternoon, Oct. 4

JOINT MEETING WITH CLAIMS ASSOCIATION

REPORT OF JOINT COMMITTEE ON TRAFFIC AND SAFETY—C. H. Evenson and H. K. Bennett, co-chairmen.

REPORT OF COMMITTEE ON BONUS AND AWARD SYSTEMS — G. T. Hellmuth chairman.

ADDRESS—"Work of the National Safety Council"—James P. Barnes, president Louisville Railway.

Wednesday Afternoon, Oct. 5

Wednesday being given over to inspection of the exhibits, there will be no meetings.

Thursday Afternoon, Oct. 6

REPORT OF COMMITTEE ON SERVICE BETTERMENT.

Discussion.

REPORT OF COMMITTEE ON RESOLUTIONS.

INSTALLATION OF OFFICERS.

PRESENTATION OF PAST-PRESIDENT'S BADGE.

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American Executive Committee Urges Car Exhibit

STRONG appeal for a representative car exhibit was made by the American Electric Railway Association executive committee in a meeting held in the office of J. H. Alexander, president Cleveland Railway, on Aug. 26. This appeal was made following a report by the exhibit committee that track reservations for car exhibits this year by both manufacturers and operators so far total 25, with only comparatively small track reservations made by some of the large car builders. President W. H. Sawyer declared that the selection of Cleveland as the site for this year's convention had been dictated primarily by the need on the part of the industry for a representative car exhibit which would help to stimulate development in design, and the improvement of electric railway service. An exhibit of cars on a scale large enough to furnish further stimulus toward improvement of design and the replacement of obsolete equipment was held by the president to be of primary importance to the welfare of the industry. Each member of the executive committee was urged to do everything in his power to aid in bringing about a car exhibit that would equal or exceed that of last year, particularly as regards improvement and development shown. Such an exhibit, insisted the president, is of vital importance to the welfare and progress of the industry.

Those who attended the meeting included the following: President W. H. Sawyer, J. P. Barnes, L. S. Storrs, J. W. Welsh, J. V. Sullivan, E. P. Waller, B. A. Hegeman, Jr., Thomas Finigan, G. A. Richardson, T. A. Kenney, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, H. L. Brown, T. W. Casey, G. L. Kippenberger representing E. B. Meissner, J. S. Kubu representing C. B. Proctor, J. H. Alexander, C. H. Beck, Paul Wilson, Martin Ackerman, E. F. Wickwire, W. R. Power, F. C. J. Dell and Charles Gordon.

Cleveland Convention Plans Almost Complete

Chairman H. L. Brown of the subjects and meetings committee reported that the program for the Cleveland convention was almost complete, with acceptances received from both of the speakers. A complete outline of the program is published elsewhere in this issue. Advance tickets for the noonday luncheon meetings on Tuesday, Wednesday and Thursday of convention week are being sold rapidly, and there were indications that space would not be available at some of the luncheons for delegates who failed to obtain their tickets at an early date.

The membership committee's report presented by Chairman C. R. Ellicott showed a current membership of 320 operating companies, 35 associate companies, 440 manufacturing companies, and 1,175 individuals. In the absence of Chairman J. H. Hanna, Managing Director Storrs for the special subcommittee on depreciation said that a meeting of the full committee, together with the committee on national relations would be held some time during the convention. Mr. Storrs also reported that the hearing on the steam road depreciation case would be held on Nov. 9 by the Interstate Commerce Commission. The committee has been assured that the electric railway case will not be called up until after the steam road decision is made by the commission.

Changes Proposed in Constitution and By-Laws

Changes in the constitution and by-laws have been prepared in pamphlet form to show the old and new provisions, for the information of delegates voting on the new constitution at the convention. Chairman E. F. Wickwire, for the committee on co-operation of manufacturers, reported progress in the preparation of two booklets for distribution at the convention, one on stimulating the replacement of obsolete equipment, and the other on suggestions for increasing the sale of car rides.

A report by the nominating committee, read by Chairman C. R. Ellicott, placed the names in nomination for officers and members of the executive committee for the ensuing year. These were published in the issue of Aug. 6, page 242.

Progress in the study of the statistical work of the association, and in the coordination of statistical activities on the part of the several agencies in the electric railway field, was reported by Chairman J. P. Barnes. A meeting of the committee will be held in New York on Sept. 19 for the purpose of drawing up final recommendations.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Sept. 7-9*—American Society of Mechanical Engineers, Machine Shop Practice Division, first national meeting, Mason Laboratory, Yale University, New Haven, Conn.**

***Sept. 8-9*—Central Electric Railway Master Mechanics Association, Hotel La Salle, South Bend, Ind.**

***Sept. 13-15*—International City Managers Association, Dubuque, Ia.**

***September 19-23*—American Welding Society, national meeting, Book-Cadillac Hotel, Detroit, Mich.**

***Sept. 26-30*—National Safety Council, annual congress, Hotel Stevens, Chicago, Ill.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

Managing Director Storrs called attention to the apparent apathy on the part of operating companies toward some of the awards offered to the industry for outstanding accomplishments. He called particular attention to the opportunity offered by the Brady Safety Award for capitalizing the safety of electric railway transportation in the eyes of the public. Entries in the Brady competition have been very disappointing, Mr. Storrs said, and indicate a failure on the part of operating companies to take advantage of the opportunity afforded. Members of the executive committee were urged to cooperate in promoting the advantages of that contest. Plans prepared by the committee on education for its program during the coming convention were read by Secretary Welsh in the absence of Chairman Edward Dana. Enough registrations in the training course for foreman-conference leaders are in hand to show that the course will be well supported. The committee is planning an educational day at the convention for Friday, Oct. 7.

Rapid Transit Report Reviewed and Committee Continued

G. A. Richardson, chairman, reviewed the report of the committee on rapid transit, which has continued the collection and interpretation of information on the subject for a period of several years. In the 1927 report the entire question of financing rapid transit, and the allocation of costs, is developed. The work of the committee has consisted in the establishment of fundamental principles regarding rapid transit construction and economics, which are expected to lay the foundation for sound financing of such construction in the future, which in turn will permit more extensive development of rapid transit facilities throughout the country than would otherwise have been the case. Although Mr. Richardson expressed the opinion that the committee's work this year would be so far completed as to avoid the need for its continuance during the next year, it was the opinion of the executive committee that the special committee should be continued in order to tie together, for the purpose of continuity of thought, the representative membership which is included. It was felt that even though only a single meeting be held next year, and no formal report prepared, there would be considerable advantage for the industry in having the committee in essentially its present organization and membership.

The insurance committee, according to chairman Paul E. Wilson, will report a second year of favorable fire loss showing. The committee will also recommend that it be authorized next year to negotiate with rate-making bodies for a general rate reduction in electric railway insurance based upon the experience record of the industry. Mr. Wilson reported an increased interest on the part of all electric railway companies in fire prevention work and said that present figures show a profit

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for the insurance companies of 18 per cent on electric railway car policies.

After some discussion it was tentatively decided to throw the convention exhibit open to the Cleveland public on Sunday afternoon and Wednesday night of convention week. President J. H. Alexander of the Cleveland Railway, as chairman of the exhibit committee, said that no trouble was anticipated from this admission of the public, and that adequate police protection would be provided to insure that exhibits will not be disturbed. An early attendance on the part of delegates to take advantage of the opening of exhibits on Saturday noon preceding convention week is indicated by the report of Paul E. Wilson, chairman of the hotel committee, that almost half of the hotel reservations so far made indicate arrival of delegates on Saturday. Regarding housing accommodations available, Mr. Wilson also reported that the Cleveland, Hollenden and Statler rooms have all been reserved, but that many good rooms in downtown hotels are still available. Telephone facilities are to be increased 100 per cent over what were available last year in order more effectively to handle convention business. Still further to facilitate inter-communition between hotels, there will be special telephone stations provided in each hotel, so that a delegate making a call from one hotel can use a station directly connected to the switchboard of another hotel. Advance registration indicates a total attendance that will exceed that of last year.

SPECIAL TRAINS PLANNED

On the subject of transportation, Carl Beck, chairman of the committee, reported arrangements for special trains from St. Louis, Chicago, New York and Boston. Most of these trains, with the possible exception of those from Chicago, will arrive Saturday night or Sunday morning, in order to permit delegates to attend the exhibit before the opening of the convention on Monday morning. Every effort will be made to stimulate early arrival by delegates.

A resolution commending the work done by J. W. Colton as editor of *Aera* was read by Secretary Welsh upon suggestion of G. A. Richardson. This resolution, which read as follows, was unanimously adopted by the executive committee.

Whereas, the executive committee of the American Electric Railway Association, believing it to be the best policy to discontinue the publication of *Aera* in its present form and supplant it with a smaller magazine without advertising, feels it proper that this statement be made regarding the services of John W. Colton, who has edited *Aera* since 1921;

Mr. Colton's editorship has been of the highest order and the change in the form of *Aera* is in no way a reflection on his ability.

He assumed the editorship at the request of association officials, resigning the editorial page directorship of the Hartford *Times,* to which position he had been called for a long and honorable period in New England journalism.

During the past four years the circulation, advertising and financial results have been completely changed and *Aera* has gained much new circulation among persons outside the industry, including financial writers, students, city officials and others. Therefore, be it

Resolved, that this executive committee extend to Mr. Colton its sincere appreciation of his efforts and assure him that he has performed the duty to which the association officials assigned him to their entire satisfaction.

H. L. Brown was instructed to draw up a suitable resolution thanking Mr. Albee, president of the Keith-Albee vaudeville theaters, for his co-operation in discouraging the needless disparagement of electric railway service from vaudeville stages. A vote of appreciation to L. J. De LaMarter, vice-president and general manager Grand Rapids Railway, for his work in enlisting Mr. Albee's co-operation, was passed by the committee.

The next meeting of the executive committee was fixed for Cleveland, Ohio, on October 7.

Members Elected

NEW members elected at the meeting of the executixe committee of the American Electric Railway Association held on Aug. 26 include twelve manufacturers and 34 individuals. A list of new company members follows:

MANUFACTURER COMPANIES

Cincinnati Car Company, Cincinnati, Ohio.
Commercial Shearing & Stamping Company, Youngstown, Ohio.
Graham-White Sander Corp., Roanoke, Va.
Hynson, Westcott & Dunning, Baltimore.
Murray Conduit Systems, New York, N. Y.
Murray Corporation of America, Detroit, Mich.
National Standard Parts Association, Detroit, Mich.
The Russell Manufacturing Company, Middletown, Conn.
Skinner Automotive Device Company, Inc., Detroit, Mich.
Snap-On Wrench Company, Chicago, Ill.
Titeflex Metal Hose Company, Newark.
The Van Dorn Electric Tool Company, Cleveland, Ohio.

Training Course for Foreman-Conference Leaders

THE staff which is to conduct the training course for foreman-conference leaders in connection with the Cleveland convention met in Washington Aug. 29 to 31 with the staff of the Industrial Education Service, Federal Board for Vocational Education. The program for the training course was worked out in detail, insuring the best possible use of the time of the members of the group. It was agreed to be necessary to hold the registration strictly to 50 and to divide the group into morning and afternoon sections, 25 men in each. On Friday, Oct. 7, "Educational Day," the two groups will meet simultaneously, in different rooms, to permit the men to attend the round-table conference, under the leadership of Dr. A. J. Rowland, which is to be held immediately after the educational luncheon on that day. On Saturday, also, the two sections will meet simultaneously in the morning so that the course will close promptly at 1 p.m. on that day.

Publications Available At A.E.R.A.

FOLLOWING is a list of publications available at the American Electric Railway Association, New York City. The supply is limited but members can obtain them free of charge upon application.

Electric Railway Practices in 1923, 1924, 1925, and Making Transportation Pay—Electric Railway Practices in 1926. Series of four volumes edited by H. H. Norris, reviewing the presentations made by electric railway companies for the Charles A. Coffin Annual Award. The presentations include new developments of progressive properties that have achieved success and show what electric railways are doing to improve transportation and how they are doing it.

Handbook of Modern Electric Railway Methods and Practices, 1925. A compilation of methods, practices, experiences and policies of electric railways of the United States as obtained from the companies by the committee on management and operation of the American Electric Railway Association.

Proceedings of the American Electric Railway Association, 1924, 1925. Annual volumes of convention reports and discussions of the problems confronting the executives of electric railway companies in the successful operation of urban and interurban transportation systems.

Proceedings of the American Electric Railway Accountants' Association, 1923, 1924, 1925. Annual volumes of convention reports and discussions of accounting methods and classifications used by electric railway companies.

Proceedings of the American Electric Railway Claims Association, 1924, 1925. Annual volumes of convention reports and discussions of the problems of the claims and medical departments of an electric railway company.

Proceedings of the American Electric Railway Engineering Association, 1924, 1925. Annual volumes of convention reports and discussions of the standards, recommendations and miscellaneous practices for apparatus and materials in the operation of the equipment, power, way, structures, purchases and stores departments of an electric railway company.

Proceedings of the American Electric Railway Transportation and Traffic Association, 1923, 1924, 1925. Annual volumes containing reports and discussions of the problems of the commercial, personnel, traffic and safety departments of an electric railway company.

Progress in Cars—Report of Committee on Essential Features of Modern Cars, 1926. Contains a series of typical cars, experiences with modern cars of three interurban and five city electric railway companies, passenger car statistics, age of electric passenger cars and a bibliography of articles on car replacements and the advantages of new cars.

Service at Cost Plans, by Harlow C. Clark, 1920. An identical analysis of statutes, ordinances, agreements and commissions' orders in effect or proposed, together with a discussion of the essentials of local transportation franchises.

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News of Other Associations

Standardized Practices of the Milwaukee Way Department*

By E. J. Archambault
Engineer Way & Structures Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

REPAIR of tracks and pavement on congested city streets becomes increasingly difficult each year. The growing congestion of vehicular traffic requires more painstaking care in planning the work and in safeguardring the workmen and the public. It is obvious that in the larger cities more track repair work must be done at night to secure the best results, and to do it at the least cost and at the greatest safety to employees. This applies particularly to the replacement of track special work parts, the minor track and pavement repairs necessary in the downtown section of the city, and especially track welding and rail grinding work. The major portion of the work of the track department, however, must necessarily be performed in the daytime. With the co-operation of the city in closing streets temporarily, obviously it can be done with more safety. with greater speed and with better results.

The track construction and reconstruction program in Milwaukee usually comprises the building of 10 to 12 miles of track in paved streets each year. It may be of interest to describe the form of track construction which has been adopted as standard in Milwaukee.

Milwaukee Track Standardized

The track trench is usually excavated for the full width of double track to a depth of 21⅜ in. below the grade of the street. This sub-grade is rolled thoroughly with a 7-ton roller. Sub-grade drains are placed crosswise of the trench at every city manhole connected with a storm sewer. No. 4 crushed limestone is then spread on the sub-grade to a depth of 6 in. and thoroughly rolled. Upon this the new track is placed. No. 2 crushed limestone is used for tamping the track. With fabricated track sections and Lorain electric butt welds the surfacing of the track is done after the welding work has been completed. In certain cases where rail ends are thermit welded the tracks are tamped in advance of the welding operation. Tie plates and tie rods are used on all city and suburban track.

By special arrangement and with the approval of the city 10-in. reinforced concrete pavement has been adopted as standard. Since 1919 more than 300,000 sq.yd. has been laid in the track zone.

The standard rail section used on the Milwaukee system is the 7¼-in. No. 102 T-rail, which has a slight bevel on the outside edge of the rail head, bringing the rail ¼ in. above the adjoining pavement.

Track Fabricated in Yard

In Milwaukee some departure has been made from the usual practice of laying track. Fabricating sections in 62-ft. lengths with the track building machine designed by our engineers enables the building of the track sections in our lower Cold Spring yard, hauling them to the job and placing 1,200 to 1,500 ft. of track in one night. We have found that this practice saves considerable time and confusion over the former method of delivering ties, rails, tie plates, spikes, etc., separately and building the track on the job.

On practically all of the track construction and reconstruction jobs extensive use is made of temporary track on the side of the street. This track is made up in 33-ft. sections, constructed of No. 60 T-rail bolted to 3-in. planks for ties. Kerwin or high type crossovers are used almost exclusively and very little trouble is experienced with derailments, as we have developed a very satisfactory design for the run-off rails for this sturdier and more substantial type crossover.

Trackwork is always carried on so as to cause the least amount of inconvenience to the public. It is the usual practice for the construction engineer to interview the business people along the street and to advise them fully of our plans. We find that this practice is productive of good will. Merchants appreciate this advance information. We make it a point to convince them, by deed as well as word, that we wish to do the work with the least amount of interference to their business. The city of Milwaukee usually permits us to shut off the street entirely to vehicular traffic, enabling the work to be carried on in the most expeditious manner. Proper detour signs are provided by the way department and placed at such places as are suggested by the city or county.

Mechanical Equipment Speeds Up Work

The use of mechanical equipment for carrying on the activities of the way department is important. The way department has three electric shovels on caterpillar tractors for excavating work, fourteen electric-driven compressor outfits, which operate pneumatic tie tampers and concrete breakers, and two electrically operated tie-tamping outfits, which are generally used on the inter-urban lines. Our equipment also includes a complete concrete paving outfit, with an up-to-date 1-yd. mixer, two bucket loaders with measuring hoppers for properly proportioning the sand and stone, several truck tractor outfits for the delivery of the aggregate to the mixer, and with a special loader for the placing of the cement on the trucks as they proceed to the mixer. This concrete outfit is also provided with a special finishing machine, which has been in use for three years, and produces a finished job which we believe is unsurpassed by any other street railway paving outfit.

For the handling of construction material in the Cold Spring yard the company has a 45-ton Brownhoist electric locomotive and two modern double drum derrick cars which are used for the handling and delivery of temporary and permanent track sections, rail and special work. Probably no single piece of equipment effects greater economies than do these derrick cars. Use is frequently made of these derricks in conjunction with the pile driver outfit and for the air-operated pile driver in breaking concrete where street pavement is removed for track extensions.

Motor Cars Have Plows

The utility division is equipped with modern Differential motor cars and trailers which provide facilities for side dumping so that the material is deposited free of the track, thus minimizing rehandling. Two of the motor cars are equipped with wing plows, air operated, which constitute some of the company's formidable snow-fighting apparatus, in addition to their use for spreading dirt and ballast on open track construction. During heavy snowstorms several trucks are available and provided with the necessary attachments for the quick installation of plows. This equipment supplements the snow sweepers of the transportation department and is used primarily for cleaning landings and special work layouts.

Cold Spring yard is provided with a sand drier outfit of modern design which was constructed a few years ago. Sand is hauled in from our gravel pit, dumped in a hopper, and by gravity is fed to a conveyor leading to the sand drier, whence it passes over a gravity screen discharging the rejection in a separate bin. A substantial structure houses the sand drier and from 4,000 to 5,000 cu.yd. of sand is run through this drier each year for use on city tracks.

The company operates its own stone quarry, about 15 miles north of Milwaukee on the Milwaukee-Northern Railway, an associated company. It is equipped with modern crushing machinery and buildings and a 50-B Bucyrus shovel and 45-ton electrically driven Brownhoist crane. The output of this quarry runs about 300 to 400

*Abstract of a paper presented before the Transportation Section, Wisconsin Utilities Association, Milwaukee, Wis., Aug. 18-19, 1927.

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tons per day, the major portion of which is used by the company for track reconstruction and paving work.

Chrome Nickel Steel Used in Special Work

It is the standard practice in Milwaukee to use chrome nickel steel on most of the track special work layouts. Its development and use came during the war, when the price of manganese steel made its use almost prohibitive, and we believe that the substitution of chrome nickel steel in place of manganese has been a boon to the industry. We get excellent results with the use of this kind of special work and have adopted it as standard. Chrome nickel steel has a great advantage in that it lends itself admirably for top welding, maintaining uniformly level flangeways in flange-bearing layouts. It permits also of the welding of the joints in the special work layout. In fact, a track special work layout is not installed in Milwaukee today without thermit welding all of the internal joints of the layout except for the standard switch and mate castings, thus making it entirely homogenous. All track special work layouts are generally paved with granite block.

During the last few years considerable attention has been given by the company to the construction of rapid transit lines. There was completed and put in operation on June 14 of last year the first of these projects. It involved the building of approximately 4½ miles of double track on private right-of-way leading from the west side of Milwaukee to a connection with the Watertown interurban west of West Allis. The building of this line reduced the running time to Watertown by approximately twenty minutes. On June 20 of this year the second step in rapid transit line construction was completed and put in operation. This consisted of a connection between the Watertown line and the East Troy-Burlington line. Although but 1 mile in length, its strategic position enabled a reduction of 23 minutes in running time between terminals. The building of these rapid transit lines has not only speeded up interurban railway service, but has opened up a vast territory for suburban development to the west and southwest of this city.

Motor Buses and Street Railways in Large Cities*

By Konrad Sieber
Managing Director Nürmberg-Fürther Street Railway

REPLIES received from operators in 45 large cities included 30 with both bus and car operation. In 25 of these cases the buses are operated directly by the railway and in the other five by subsidiaries.

The preponderant use of the bus for routes where the traffic is light is indicated by the fact that the annual car trips varied from 128,000 to 461,000 per kilometer of route (205,000 to 738,000 per mile), whereas the bus range was less than half this (8,100 to 172,000 per kilometer of route, or 13,000 to 275,000 per mile of route). The flexibility and small capital investment of the bus are of great benefit in developing new realty values.

Most of the bus routes are not directly profitable, but this is to be expected in view of their extensive use as feeders.

Data on operating and overhead costs are more liberally supplied than reports on profits, but there is room for greater clarity in accounting. The operating expenses of street railways are given as ranging from 45 to 102 pf. per car-kilometer (16.2 cents to 40.2 cents per car-mile), while that of buses are from 34 to 132 pf. per kilometer (13.6 cents to 52.8 cents per mile). The average operating cost of cars was 65.1 pf. per car-kilometer (26.1 cents per car-mile) and of buses 74.5 pf. per bus-kilometer (29.8 cents per bus-mile).

The chief difference between cities in operating cost is due to wages, which range from 65 to 238 pf. (16.2 cents to 59.5 cents) an hour. Next in line is the character of operation. Thus, the same wages and vehicles yield a range of 55.8 pf. to 118.7 pf. per bus-kilometer (22.3 cents to 53.5 cents per bus-mile) because the annual performance ranges from 50,300 km. (31,186 miles) to 18,900 km. (11,718 miles).

The only certainties are that for like conditions the bus costs materially more than the car in power, lubrication and wheel (tire) wear.

Railways usually pay heavier taxes than the buses, reaching a maximum of 14.5 pf. per car-kilometer (5.76 cents per car-mile), whereas the bus maximum is 8.1 pf. (3.2 cents per bus-mile).

Capital charges on street railways range from 5 to 24 pf. per car-kilometer (1.4 to 9.6 cents per car-mile); on buses from 5 to 30 pf. (1.4 to 12 cents). The overhead for railways goes up rapidly as the traffic becomes thinner.

After weighing the various factors involved, it may be said broadly that the dividing line in favor of the rail for a service offering an equal number of seats is a twenty-minute headway, but with no allowance for interest charges on track. It may also be said that a bus route is not ready for conversion to rail until it is economical to replace the buses with the same or a shorter headway with cars of larger capacity.

There appears to be no great difference in the accident record of the car and the bus. Comparison is difficult in any event, because the two types are used under such different circumstances. The average of thirteen operators showed 5.06 collisions per 100,000 car-kilometers (per 62,000 car-miles) and 5.28 per 100,000 bus-kilometers (per 62,000 bus-miles). The corresponding personal injury averages are 2.66 for the car and 1.74 for the bus. The higher car figure is probably due to the inclusion of trailers as though they were part of a motor car.

Where the bus is operated as supplementary on a unified flat-fare transportation system, rates tend to be the same as on the cars. A number of zone-fare systems, however, charge 30 to 40 per cent more on the buses. Most systems charge higher fares in any event. There are also cases where suburban bus rates are modified if the passenger continues via car.

Chartered service amounts often to 10 per cent of gross revenue at rates varying from 90 pf. to 2 marks per kilometer (36 cents to 80 cents per mile).

Running Speeds

Permissible running speed of buses over different sections of city streets ranges up to 45 km. (27.9 miles) per hour, with an average of 30 km. (18.6 miles). Occasionally a speed like 16 km. (9.92 miles) is specified because trailers are used.

On the other hand, many street railways are still supposed to stick to 25-year-old regulations specifying rates like 8 km. (5 miles) per hour over certain sections. The few tramways which are free to run at any speed in the discretion of the motorman are also those showing the least number of accidents per 100,000 ton-kilometers.

Yet some systems report speeds actually below those permitted by ordinance. The range of car running speeds reported is 18 km. to 50 km. (11.16 to 31.0 miles) per hour, and of buses, 25 to 60 km. (15.5 to 37.2 miles).

The difficulty with the lowest-speed railways is that the rates of acceleration are too low to permit satisfactory schedule speeds. In this connection, the new articulated motor-car train of the Berlin Street Railways is commended because it enjoys a good rate of acceleration, even on slippery rail.

Schedule speed (probably exclusive of layovers—Ed.) of street railways ranges from 12 to 17.24 km. (7.44 to 10.69 miles) per hour, and of buses, from 10.8 to 25 km. (6.7 to 15.5 miles). The higher speeds include suburban routes. There is no substantial difference in speed of car and bus under like traffic conditions.

Speed is of such extraordinary importance in large city transport that a

*Abstract of paper presented at Copenhagen convention of the Internationaler Strassenbahn und Kleinbahnverein (International Street and Interburban Railway Association), June 22-24, 1927.

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saving of five minutes per trip for each of the 4,000,000,000 riders a year carried by association members would save 20,000,000,000 minutes, worth 200,000,000 marks (approximately $40,000,000), if the riders' time was valued at 1 pf. (0.25 cent) a minute. Such an increase in speed would bring about 50,000,000 marks (approximately $12,500,000) more operating revenue and almost as great a saving in operating expenses.

Besides a higher rate of acceleration, the stop spacing, car type, make-up of train and braking equipment are important factors in raising schedule speed.

As to the most efficient capacity for cars, the experience in America with large cars in competition with jitneys and buses on shorter headways is proof that cars must not be so large as to tempt the operator to lengthen headways. Replies to the questionnaire show that operators in large cities are of this opinion, as their preference is for cars 9 to 11 m. (29.5 ft. to 36 ft.) over all. There is a greater difference of opinion concerning the proper motor bus capacity.

On dry roads the braking of cars and buses seems to be equally efficient, but cars are affected somewhat by slippery rail.

Rates of Passenger Interchange

Wide variations exist in the speed of passenger interchange. On ordinary cars it takes 1.5 to 2 seconds per passenger, but with extra doors this time has been cut to 0.75 second per passenger. Vienna reports a record of 0.3 second per passenger in filling a car with 100 passengers pleasure-bound. Vienna motor cars have three doors and the trailers have four.

On one of the association properties reduced stop time by means of three-door cars and a spacing of 430 m. (1,410 ft.) between stops would produce a schedule speed of 17.2 km. (10.66 miles) per hour.

Theoretically, a satisfactory passenger interchange rate ought to be secured with one exit or entrance passage for every 3.38 m. (10.9 ft.) of car length. On such a car the effective passenger-carrying area would be 5.3 sq.m. (57 sq.ft.) per passage. On buses with no more than two passages at best the area per passage must not exceed 10.6 sq.m. (114 sq.ft.) if the bus is not to fall too far behind three-door cars in handling heavy traffic.

Only five street railway and two bus operators used separate exits and entrances. Others had abandoned this practice because of unbalanced loading and resulting arguments with passengers who could not see why they should not have the right to use any passage available.

Vienna reported a total of 30,000 car passengers handled per hour one way on a single track which is believed to be a world record. Two or three lines of buses would have been required for the same job. A high bus figure is that of 5,680 passengers per hour for the Fifth Avenue Coach Company between 31st and 42d Street, as given in the Electric Railway Journal, page 590, Oct. 10, 1925.

The plan sometimes suggested of running buses in the downtown areas and cars in the outer areas with transfer of passengers is not desirable. The opposite method would be more logical.

Eight rail systems and eight bus systems operate one-man equipment, but only for light service. At Vienna auxiliary conductors and slot machines for ticket sales help to broaden the scope of one-man operation. Several undertakings gave up one-man operation because their excessive stop time for passenger interchange delayed other street traffic.

Increasing Passenger Comfort

The consensus of opinion on means for increasing passenger comfort and traffic may be summarized as follows: Replace obsolete cars with new cars possessing large platforms, low floors, low windows with arm rests, pleasing interior, unimpeded outlook, mirrors, leather cushions with suitable proportion of cross-seats, broad aisles, comfortable handholds for standees, good lighting, good ventilation, improved spring suspension, more easily read destination signs, display of pleasing local scenes within the cars, electric heating (with fresh air instead of exhaust in buses), pneumatic tires, six-cylinder buses, decreased noise, better upkeep and greater cleanliness. A variety of track improvements are also desirable, as well as safety islands and more sheltered waiting places. Increased attention could also be given to time-tables for the public and various types of fares to meet the varying degrees of patronage.

Higher schedule speed would be obtained by such measures as: More powerful motors, three or four exits and entrances per car, up-to-date brakes, electric signals (push-button, door contact, etc.), bow contact for current collection, which avoids wire derailment delays, shorter intervals by decreasing train units, synchronized watches and clocks, stops lengthened to intervals of 400 to 500 m. (1,312 ft. to 1,640 ft.) etc.

The increasing congestion from automobiles which use street space so inefficiently calls for many changes in street railway practice, such as rerouting, relocation of tracks in streets and plazas, safety isles, stop-and-go signals and motorman's signals for securing a quicker getaway from the traffic policeman. It is a question whether the street railway should have to bear so much of the burden of reconstruction cost, but it is unwise to follow a needlessly obstructive policy.

The answers to supplementary questions on bus practice showed that pneumatic tires are used almost everywhere with an average life of 30,000 km. (18,000 miles). Seven undertakings have six-wheelers in service. Sixteen undertakings operate with right-hand control, seven with left-hand and five use either.

Reducing Accidents*

By J. H. Handlon
Claim Agent Market Street Railway, San Francisco, Cal.

From a brief review of the effort now being put forth it would appear offhand that all that we can do to further safety work is to show greater zeal and to render more effective what is now being done. However, I submit these suggestions hopeful that perhaps some, if not all, will, if adopted, be the means of further reducing accidents.

1. I would suggest a closer study of the accident breeding habits of employees. A closer supervision of each man's work and a study of each man's accident record may reveal a tendency on his part to take unnecessary chances, or follow careless habits, or both.

2. The transportation department should be urged to avail itself of the opportunity the claim department offers it to investigate and determine the causes of accidents regardless of whether a claim is presented, for when causes are determined then remedies can be applied, assuming that the conditions are controlled by the company.

3. A careful inspection of company property and trackage should be continually maintained. Construction work; new buildings; street work; new crossings; temporary or permanent diversion of street traffic; new grade crossings; obstructions near company tracks, etc., all set up hazards of which due cognizance should be taken and safety measures adopted to meet these changed conditions.

4. Consideration should be given to establishing a uniform method of detecting, systematically, defects in eyesight and hearing of platform men and some thought to the advisability of devising tests to see how they respond to certain circumstances and conditions.

5. Claim agents should keep fully informed all operating officials of instances that come to their attention of employees being careless or derelict in the performance of their duties, realizing that their impartial investigations disclose facts that would otherwise not be known.

6. Claim agents should also investigate the cost from an accident standpoint so far as possible of any alterations or changes in the rolling stock or any saving effected by their use.

7. Through company magazines and by means of badges, buttons or some other insignia recognition should be given to the platform men having excellent accident records and a permanent safety campaign should be fostered.

8. Every effort should be made to lessen the turn over of platform men on the theory that the experienced trainman is better qualified to prevent accidents. Splendid work in this direction can be done by interviewing every employee who voluntarily leaves the service.

*Abstract of a paper presented before the eighteenth annual convention of the Pacific Claim Agents' Association, Tacoma, Wash., July 21-23.

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News of the Industry

Summary of Piedmont Briefs

Pros and cons cited on application of Southern Electric Railway to Build 128 miles of line

QUESTIONS as to the jurisdiction of the Interstate Commerce Commission to issue or withold a certificate authorizing the construction of an extension of an electric interurban railway, as well as issues raised by the opposition of existing steam railroads to the proposed extension, are discussed in briefs just filed with the commission. The case involves the application of the Piedmont & Northern Railway for authority to connect its existing lines by completing the gap between Spartanburg, S. C., and Gastonia, N. C., 53 miles, and by building from Charlotte, N. C., via Salisbury, to Winston-Salem, N. C., 75 miles.

The application is opposed by the Southern Railway, the Seaboard Air Line Railway, and the Atlantic Coast Line Railroad, with its affiliated lines, the Louisville & Nashville, the Carolina, Clinchfield & Ohio and the Charleston & Western Carolina, while the Georgia & Florida Railroad is supporting the application.

The applicant electric line, in addition to pointing out what it asserts to be the public need for the proposed extension, takes the position that its road is not operated as a part or parts of a general steam railroad system of transportation, and is therefore, by paragraph 22 of section 1 of the interstate commerce act expressly excluded from the operations of paragraphs 18 and 21 of section 1, under which the commission grants certificates of convenience and necessity.

Says Commission Is Without Jurisdiction

It contends that the commission is without jurisdiction also on the ground that the proposed construction was begun in good faith prior to the effective date of paragraph 18 and was never abandoned. However, it asks, that in the event the commission holds it has jurisdiction, the certificates be issued permitting the proposed lines to be built.

The Georgia & Florida, in its brief supporting the application, points out that it operates a line from Madison, Fla., to Augusta, Ga., and is now engaged in extending its line 56 miles from its northern terminus at Augusta, Ga., to Greenwood, S. C., where it will connect with the Piedmont & Northern, so that it is vitally interested in the proposed through routes that would be opened up by the electric line extensions. This company believes that the exceptionally favored territory in Georgia and North and South Carolina, served by the petitioner and the Georgia & Florida, which already has made such remarkable strides industrially and agriculturally within the last decade, is destined to expand even more rapidly within the next few years. It says that "the Piedmont & Northern will introduce into this territory much needed and healthy competition and thus improve vastly the convenience of the public."

It is also asserted in the briefs in favor of the application that it is supported by every available representative of public interest in the territory affected, including the Governors of North and South Carolina, the Railroad Commission of the State of South Carolina, the Corporation Commission of the State of North Carolina and by representatives of cities and towns, shippers and citizens generally.

As indicated previously in the Electric Railway Journal, the Southern Railway, in its brief, says the Piedmont & Northern is controlled by the "Duke interests" that control the Southern Power Company, Southern Public Utilities Company and other allied companies, and that these relations have resulted in control by it of a vast amount of traffic.

The Piedmont & Northern contends, in its brief, that the community of interest existing between it and the power interests is neither improper, illegal nor opposed to the public interest; that business diverted from other lines will be inconsequential, and that the proposed lines will develop additional traffic and furnish competition in transportation.

Tacoma Railway Replies

Charges in Engineer Harlan's report refuted by Manager Sullivan. Offers solution. Another answer on way. New franchise suggested with sliding scale of fares and fixed minimum return

THE Tacoma Railway & Power Company, Tacoma, Wash., in a 197-page report has replied to the report prepared by Kenneth G. Harlan, city utilities engineer, several months ago. The propriety of the financial set-up of the company, economy of its operation, justification of certain operating and interest charges, valuation for rate-fixing purposes and various other angles to the Tacoma transportation problem have been presented in the report. Taking issue with the city engineer on practically all his theories of public service corporation finance and operation it supplements the report with 121 pages devoted to alleged errors of fact and figures in the city report. The original report took eight months to prepare and covered 221 pages. It was received by the Tacoma management on April 30 and the answer was filed on Aug. 22. The City Council has taken the reply, signed by R. T. Sullivan, manager of the company, under advisement and the author of the original report says he will have an answer to the railway reply within ten days.

Use of Ingenious Methods Charged

It is charged that the Harlan report figured average fare by dividing the number of revenue passengers into the total revenue, including freight, express, advertising space and power sold, rather than including passenger revenue; that it assumed that all power ever purchased by the local street railway companies would have been purchased at a new and reduced rate which the city of Tacoma municipal light plant put into effect on Aug. 1, 1926, the previous rate having been nearly double the new rate; that it assumed that extensions and betterments were made at no cost, whereas, as a matter of fact the company claims that all of the net earnings available and millions besides have been spent on improvements and betterments.

Replying to the charge that operating costs of the Tacoma street car system were unnecessarily high, the company shows that the Tacoma Railway & Power Company and the Pacific Traction Company are operating efficiently, the cost per car-mile in 1926 having been only 23.12 cents. In this connection it points out that there are only two cities of more than 100,000 people in the United States operating at a lower cost per mile, according to the American Electric Railway Association's analysis.

Whereas the Harlan report asserted that a valuation of not more than $2,500,000 could be justified, the reply asserted that if a revaluation were made today of the properties in Tacoma, a figure much higher than that allowed by the state now for rate-making purposes would be given, $10,000,000.

The reply concluded its analysis of the situation with a suggestion for a solution, consisting of a proposal for a new franchise to supplant the 40 existing and varying franchises. This should provide for a sliding scale of fares, depending on the showing of returns made, and permitting the company to earn, if possible, a certain minimum after taxes. Manager Sullivan, in submitting his suggestions.

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for a solution, asserted the readiness of the company to meet the city more than half-way and do everything possible to give the city an adequate service for the upbuilding of the city.

Engineer Harlan, after a hurried scanning of the company's refutation of these and other charges, declared it was an attempt to confuse the issue with a mass of irrelevant and unimportant correction of things he never intended to be accurate to the penny. He declared he was ready to meet the company upon all issues raised.

City Council Revises Chicago Bills

Aldermen decide to appoint sub-committee to draft an entirely new set of bills for presentation to Assembly. Governor to be heard from on special legislation session

DETERMINATION on the part of the City Council of Chicago to work out a traction program satisfactory to both city and companies was renewed after a lull of more than three weeks on Aug. 17, when the Aldermen decided to appoint a subcommittee to draft an entirely new set of bills for presentation to the general assembly, if Governor Small keeps his original promise to call a special session in October. The new bills are to represent the city's viewpoint on the legislation required to settle the city's traction problems, while the five bills defeated by the Legislature last June were regarded as company measures.

Prior to the appointment of this subcommittee a written opinion on the validity of the five former bills and their amendments was given the Aldermen by Corporation Counsel Breen. Briefly, the opinion holds that three of the bills and their amendments are constitutional but that two of them are not. The three that were found legal are the subway bill, the local transit commission bill and the measure which changes the cities and villages acts to conform to the proposed changes in other bills. Amendments added to the indeterminate permit and traction unification bills in the house of representatives make them unconstitutional, the opinion holds.

Although the old bills together with amendments are being used as a working basis by the new subcommittee, many important changes have been made in the new drafts. In the two weeks following its appointment, the subcommittee had completed the revision of the entire set of bills, *i.e.*, the measures dealing with the length of franchise grants, local transit commission, unification of local transportation systems, amending the cities and villages act, and the construction of subways. Among the most important of the changes adopted was the elimination of an amendment to House bill No. 437 which limited franchises to 40 years. The new bill would permit the city to grant either an indeterminate permit or a franchise for 20, 30, 40, 75 or any other period.

Revisions to the local transit commission bill provide that four of the five members of that body shall be appointed by the Mayor and the fifth by the County Board, whereas the original bill specified that two members should be named by the Governor, two by the Mayor and one by the County Board. With the completion of the work of revising the bills, the sub-committee is now ready to report to the full committee.

Anxiety over the prospects for a permanent settlement of the traction problem this fall caused the City Council to appoint a second subcommittee to confer with Governor Small at Springfield Aug. 23 to learn whether he will stand by his original promise to call a special session of the legislature to consider enabling legislation when the city and companies have agreed on a unified transit program. The city's alarm in this matter was attributed to a statement made by the Governor the previous week in which he intimated that he would have the legislature pass the necessary laws only if an ordinance is first submitted to and approved at a popular referendum, as well as by the city and companies.

The Governor refused to commit himself on the matter, however, until he can reach some agreement with Mayor Thompson, and the Alderman returned to Chicago with less hope than ever for a special session.

New Business Campaign of Illinois Traction

A new business campaign was started on July 15 by the Illinois Traction System. It is built on the idea that the modern railway company can no longer be content with accepting only the business that may come to it through the usual channels of solicitation. Its first effort along the line of interesting employees in selling its services was the organization of the Go-Getters Club. This activity has now been enlarged and intensified with the present organization known as the Employees New Business Club, which is extended to employees of Illinois Power & Light Corporation and associated companies. It started its activities with a special 90 day summer campaign. The co-operation of employees of the several associated companies has been invited and is freely given on the basis that whatever is good for the Illinois Traction System is good for the entire company family.

Employees of Illinois Traction System numbering about 2,000 men and women will endeavor during this 90-day special campaign to make an average of one call per day on a prospective customer for Illinois Traction System service. Each employee will talk to his friends, his neighbors, his lodge and church associates, his local merchant or manufacturer, with the idea in view of selling the services of the railway. Where it is possible to secure a direct piece of passenger, freight or express business this will be done, but the prospects will be told about these services.

Employees of the Illinois Power & Light Corporation in the territory served by Illinois Traction Systems are co-operating in this campaign to the extent of acquainting themselves with the specific services of the electric railway and soliciting business in the same manner as Illinois Traction System employees, except that they are not asked to make daily reports. Neither do they participate in the competitive feature of the campaign.

Referendum to Be Recommended in New York

In his report to the commission which is partially completed Samuel Untermyer, special counsel of the Transit Commission, will recommend a referendum to determine if the voters favor the maintenance of the 5-cent fare on the city's proposed unified transit system with the deficit from operation, if any, carried and paid by the taxpayers. He will make it clear, however, that no loss is expected. His plan will be based on the recapture of the Brooklyn-Manhattan Transit Corporation subway system. Mr. Untermyer's idea is that the returns from these profitable lines will go a long way toward carrying the high-cost new subways at a 5-cent fare.

Negotiations with representatives of the Interborough Rapid Transit Company for the purchase of its lines, unsuccessful so far, are still pending. The great difficulty in the negotiations with the Interborough has been the necessity for making some arrangement with the stockholders of the Manhattan Railway, which owns the Manhattan and Bronx elevated lines, now operated by the Interborough on a 99-year lease.

Dayton and Springfield Properties Sold

The Peoples Railway, Dayton, and the local railway in Springfield, Ohio, owned by the same interests, are reported sold. The new owners are Wood & Turner, Philadelphia.

The Peoples Railway for years was owned by the American Railways. It was later sold to the American Gas & Electric Company. Wood & Turner were anxious to procure the Electric Light & Power Company in Wilmington, Del., owned by the American Gas & Electric Company, but that company is said to have refused to sell the Wilmington utilities unless the two Ohio companies were included. The property is not to be formally transferred until Sept. 15.

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Baltimore Fare Hearing Set

The Maryland Public Service Commission has set Sept. 6 as the date to start a hearing for an increase in fares on the application of the United Railways & Electric Company, Baltimore. The company seeks to raise the fare from 8 cents, or two tokens for 15 cents, to 10 cents. In addition it applied for an immediate emergency increase. This plea will be heard first.

An intervening petition against an increase of fare for the United Railways & Electric Company, Baltimore, has been filed with the Maryland Public Service Commission by The People's Committee Against Increased Fares of the People's Corporation.

This petition declares among other things that there is no unforeseen sharp or unusual rise in the cost of doing business or unforeseen lapse in the volume of business; that loss of 29,000,000 passengers since the fare was increased to 7½ cents, despite normal increase in population, is due to the increase and not to automobile competition as contended by the company; unprofitable long riding has grown and short riding has decreased, fare increases being held responsible. The petition says that as a matter of principle and common fairness, the company's right to a fair return on fair value is not disputed, but "we do protest the suicidal and reactionary policy of attempting to increase returns by further advance in fares."

Date Set for North Shore Rate Hearing

A hearing is to be held in Chicago on Sept. 15 before Examiner Hoy on the intrastate passenger rates of the Chicago, North Shore & Milwaukee Railroad within the states of Illinois and Wisconsin. Formal investigation was ordered recently by the Interstate Commerce Commission. In a petition the railroad alleged that its passenger fares between points in each state were below the level of rates charged for interstate travel and that the railroad commissions of both states had refused to permit an increase in local tariffs.

Higher Fare Sought in Madison

The Madison Railways, Madison, Wis., filed a petition with the Wisconsin Railroad Commission on Aug. 17, asking that the rate in Madison be raised to 10 cents for adults and 5 cents for children under twelve years. It was claimed by the company that such increases were necessary to carry out its program of improvements. W. Dineen, secretary of the commission, stated that the petition would be heard in September.

An increase on Jan. 2, 1925, was allowed to provide funds to carry out a program of additions and improvements agreed upon between the railway and the city of Madison. According to the petition, "during the 30 months which has elapsed since that order was entered the revenues of petitioner accruing under such schedule of rates and fares have been at all times insufficient to provide petitioner with any funds to carry out said program." The petition also stated that the rates of fare had been and were inadequate to afford a reasonable return on the fair value of its property devoted to the service of the public.

If the plea is allowed, tickets or tokens would sell at fifteen for $1. At present they are seventeen for $1. School children's tickets would undergo no change in price.

The petition was signed by F. W. Montgomery, president, and Alice N. Montgomery, secretary of the company.

Changes in Holyoke Delayed One Month

At a hearing before the Massachusetts Public Utilities Commission on Aug. 23 on the petition of the Holyoke Street Railway, Holyoke, Mass., for a readjustment of its fare rates and a revision of its zoning system, a delay of one month, making Oct. 1 the day when it is proposed to make the changes effective, was granted on request of city officials of Holyoke and Chicopee. More time was desired by them to study the schedules. A further hearing by the commission on the subject was set for Sept. 21. L. D. Pellissier, president of the company, said it was expected the readjustment would bring in about $175,000 additional revenue yearly.

An unusual feature of the first hearing before the utilities board, on Aug. 23, was that all the speakers, mayors, legislators, aldermen and selectmen, paid the Holyoke Street Railway the compliment that it was giving satisfactory service, maintaining adequate equipment and presenting a fine upkeep. There was no complaint against the company, but a feeling that it might not be necessary to give it a 25 per cent increase in fares.

State Sues United Railways for Collections from Riders

The State of Missouri on Aug. 29 filed suit in the United States District Court in St. Louis to take from the United Railways a total of $83,000 collected from car riders last February under the form of an increase in fare which a special United States Court later held was not warranted. At the time the fare increase was put into effect the company was operating under the protection of an order from Federal Judge Reeves of Kansas City.

During this period the company raised the fare from 7 cents to 8 cents, but gave receipts for the extra penny to passengers on demand. Later when the special court ruled against the company those passengers who presented the receipts were paid back the pennies. While the 8-cent temporary fare was in effect the company collected about $85,000 in extra pennies, but later returned $2,000 to patrons who presented the desired receipts.

The state now contends that the company has no legal right to retain the money and that it is the property of the people who paid it. The state seeks to place it in a fund and if the rightful owners do not assert their claims to turn it over to the state treasurer for state expenditures.

The state suit is in the nature of an intervening petition in the federal receivership case. Charles W. Bates, counsel for Receiver Rolla Wells, has stated that the suit of the state will be vigorously opposed.

Charles W. Bull, associate city counselor, several days ago informed the St. Louis Board of Estimate and Apportionment that neither the city nor the state had a legal right to claim the money. That the return of the extra fare was a private matter between the company and the car rider and that if the car rider did not claim the money the company could retain it.

Portland Employees to Serve as Tourist Guides

Franklin T. Griffith, president of the Portland Electric Power Company, Portland, Ore., has suggested through a letter to Mayor Baker of Portland that the services of a staff of seventeen traffic inspectors of his company be allowed to act as volunteer information guides while on duty during convention periods or heavy tourist seasons. He said these men were carefully instructed in service of this character. The Mayor replied that the offer was appreciated as an excellent suggestion and that it would help to create a spirit of welcome to travelers in the city.

Mercury Arc System in Bridgeport

Energy for street railway operation by the Connecticut Company in the city of Bridgeport was changed over on Aug. 23 from the company's own generating system to a mercury arc rectifier system fed from the lines of the New York, New Haven & Hartford Railroad. Mention of the order placed for the rectifiers was made in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 22, 1927, page 189.

Hearing on Schenectady Fares Scheduled

A hearing will be held before the Public Service Commission in Albany, on Sept. 8, on the petition of the Schenectady Railway for permission to increase its cash fare rate in Schenectady, N.Y., and in each operating zone on its Albany, Troy and Saratoga divisions from 7 to 10 cents and school tickets from 2½ to 3 cents. The company also asks the right to increase commutation ticket rates.

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Recent Bus Developments

Albany Official Wants Trolley Given a Chance

Bertrand T. Fay, assistant to the vice-president of the United Traction Company and the Capitol District Transportation Company, Albany, N. Y., in an interview with the Albany representative of the ELECTRIC RAILWAY JOURNAL on Aug. 18, declared that in his opinion people generally preferred the bus as a means of transportation in Albany because the bus is constantly moving while the cars of the electric railway are often held for long intervals by congested traffic.

When the United Traction Company embarked on bus transportation three years ago Mr. Fay was placed in active charge of the supervision of the bus operation under the direction of the general manager and vice-president. He has made an exhaustive study of bus conditions of traffic as compared with the street car.

Contrary to the opinion expressed by L. F. Loree, of the Delaware & Hudson Railroad, about a year ago, Mr. Fay does not expect the bus to supplant the street car. He said:

If the automobile traffic on the streets which impedes the street car could be speeded up, the street car would rapidly assert its superiority. While the street car invariably arrives at the end of the route ahead of the bus, the people seem to prefer the bus as a means of transportation because it is almost constantly in motion. They think they are getting there quicker.

My personal opinion is that there is no comparing the comfort of riding in a trolley car with the bus. The trolley car is light, airy and roomy. The bus is often crowded and there is a certain amount of gas that will escape into the car. Yet people seem to prefer all this to the trolley car. My idea is that if the trolley cars were given an even chance to go through the public streets and the carriageway was restricted to moving traffic you would solve the problem of rapid transit.

Buses Expected on Five Auburn Lines

There was a further hearing before Public Service Commissioner Lunn on Aug. 30 on the petitions of the Auburn & Syracuse Electric Railroad for approval of declarations of abandonment of five of its lines in the city of Auburn, N. Y.

It was stated by Mr. Elder, city representative, that the city had arranged with a new company to operate bus lines over the routes traversed by the five trolley lines and that it was expected the bus lines would be in operation by Oct. 15, to operate on a 7-cent fare.

Provided the bus lines are established there will be no objection to the abandonment of the trolley lines. It is expected that applications will soon be made to the commission for the required authority for operation by the bus lines and early hearing will follow. The case was ordered closed by Commissioner Lunn.

Commission Authorizes Seven Rye Lines

The Public Service Commission on Aug. 23 issued to the County Transportation Company, Inc., a certificate covering the operation of seven lines in Rye, N. Y., to provide bus service where street car lines have been abandoned.

The bus routes are not identical with the lines of the railway and the commission's certificate is subject to the terms of the consent by the village authorities granted on April 6, May 23 and June 15 last. There was no opposition to the company's application at a hearing before Commissioner Van Namee.

The company proposes to use eighteen buses, each carrying 29 passengers, with a zone fare of 10 cents with transfers to other zones in Rye.

The change in service is part of the general reorganization by the New York & Stamford Railway of its transportation system in towns and villages in Westchester County.

Bus Terminal Planned in Heart of New York

Plans to establish in New York City, N. Y., a terminal for interurban bus lines are now being executed following the leasing of Astor Court, the private street running from 33rd to 34th Street at the Waldorf-Astoria Hotel, by the Gray Line Motor Tours, Inc. The spacious area leased from the hotel, which owns the property, together with a large room in the western end of the Waldorf, adjoining the court, will give the Gray Line, which has been operating its sightseeing and tours service from the hotel for some time, rights to the 6,000 square feet of space.

Since the recent regulation of the Police Department has necessitated the establishment of permanent terminals off the streets for interurban bus lines, the Astor Court terminal, to be shared by many other bus companies, will go a long way toward solving the traffic and parking problem, as well as centralizing interurban bus operation for the benefit of the public. The station will be operated under the name of the Gray Line Waldorf-Astoria Bus Terminal. It is estimated that it can take care of buses to the extent of from 500 to 700 a day. J. J. Reddington, manager of the Gray Line Motor Tours, says that the establishment of this terminal will stimulate interurban bus travel. The terminal will be operating early in September.

Alabama Buses Under Commission Jurisdiction

Operation of buses over the state highways of Alabama is now under the jurisdiction of the Alabama Public Service Commission, through a bill which was recently adopted by the Alabama Legislature and favored by a number of companies operating bus lines. Under the new law all bus companies are required to file a petition with the commission for a permit to operate. The commission has the right to allow or refuse the petition.

Before the enactment of this legislative act there was practically no law in Alabama governing the operation of buses on public highways. The last State Legislature before the present one did not enact any bus legislation because there were no bus lines in operation in the state at that time.

Virginia Utility Opposes Bus Grant

The Petersburg-Hopewell & City Point Railway, Petersburg, Va., will oppose the operation of a bus line from Petersburg to Hopewell, according to a statement made by Samuel W. Zimmer, president and general counsel for the company. The Southside Transportation Company recently was granted a franchise to operate a bus service between the two cities, effective within 30 days. The car line serves all plants in Hopewell except Hummell Ross. It is proposed by the bus company to operate buses into the plant area. The franchise calls for three buses to be operated daily with a 60-cent round-trip fare between Petersburg and Hopewell. The car line is operating on a 35-minute schedule at a round trip fare of 25 cents for a labor ticket.

The Councils of Petersburg and Hopewell had opposed the granting of the franchise. It is said that the trolley company will appeal the granting of this franchise to the Supreme Court of Appeals of Virginia, on the grounds that the present railway schedule serves the public adequately by the 35-minute schedule now maintained and also that the company has vested rights in the franchise. During the past few years there has been a decrease on account of business conditions, and now, since there has been a considerable increase of traffic between the cities on account of the new industries, Mr. Zimmer believes the car line is entitled to some returns from the investment.

Toledo Considers Golfers' Trials

A special bus service of three buses a day from the end of the Wildwood feeder line to Heather Downs Country Club for the use of golfers, caddies and residents of the district has been started as an experiment by the Community Traction Company, Toledo, Ohio. Service will be increased if the patronage warrants.

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Bus Competition for Oklahoma Interurban Railways

Over the protest of both steam and electric railways the Corporation Commission of Oklahoma has authorized through bus transportation between Oklahoma City and Ardmore, Oklahoma City and Stillwater and Oklahoma City and Tulsa. These routes parallel electric lines between Oklahoma City and Norman, Oklahoma City and Guthrie and Sapulpa and Tulsa. The commission has assumed to modify or neutralize the effects of the new competition by prohibiting the motor carriers from picking up or discharging passengers between points served by electric railways, but the latter lines express apprehension over the loss of business heretofore delivered to them at points of connection with the motor routes.

North Shore Line Renews Chicago-Milwaukee Bus Service

Supplementary motor coach service between downtown Chicago and the business center of Milwaukee was reestablished on Aug. 20 by the Chicago, North Shore & Milwaukee Railroad. A similar coach service between these cities was started last year by the North Shore Line but was discontinued after a few months because of insufficient earnings.

The new line is operated as a nonstop service between Evanston, Ill., a suburb of Chicago, and Milwaukee. Only interstate passengers are carried. Coaches leave the Auditorium Hotel in the Chicago "Loop" at 8:20 a.m. and 2:20 p.m. daily for Milwaukee, stopping at the North Shore Line rail terminals at Adams Street and Wabash Avenue, Wilson Avenue, Chicago, and Dempster Street, Evanston. Two trips are also made daily from the Milwaukee terminal of the railroad to Chicago. The coaches make the 90-mile run each way in 3½ hours, connecting at Wilson Avenue and Dempster Street with the company's trains to and from Chicago. The new motor coach rate between Chicago and Milwaukee is $3.06. Tickets are interchangeable, being honored on either the buses or trains.

Service on the new route is furnished with one 29-passenger A.C.F. Newell type parlor-observation coach and one, 29-passenger Fageol parlor coach.

Bus Terminal at Cincinnati Under Attack

The use of Government Square, Cincinnati, Ohio, for a terminal for all motor coaches entering the downtown district may be discontinued if the suit of Eli G. Frankelstein is successful. He seeks in the Common Pleas Court to enjoin Col. C. O. Sherrill, City Manager, from enforcing the order which permitted the use of the square for a bus terminal.

Government Square, in the center of the main business district, is a block long and about 100 ft. wide. The center of this square for its full length is devoted to buses of both city and interurban lines. These include vehicles on four city motor coach lines, the Cincinnati Street Railway Company's coach lines and Interurban lines to all parts of Ohio and to cities in Kentucky and Indiana.

Mr. Frankenstein declares that in spite of the fact that the square was dedicated to general street purposes the city has barred all vehicles except buses from one-third of its width and these buses have paid nothing in return for this exclusive privilege. He says the lives and property of the traveling public are menaced because people are permitted to cross the lanes of traffic at any point in this block to the consternation of motorists, who never know when some one will dart in front of them to the buses.

The question of removing the terminal from the square has been up for consideration several times, but city officials have delayed action, recognizing that the square is a very convenient location for this loading.

Iowa Tax Law Again Censored

A second attack on the constitutionality of the Iowa law which taxes buses and freight carriers operating between fixed terminals was heard recently in the Polk County (Iowa) District Court. Advancing the charge that the law passed by the 41st General Assembly is discriminatory in its application, the Iowa Motor Vehicle Association and 25 bus operators of the state began suit before Judge William Bonner to prevent the Board of Railroad Commissioners from collecting the so-called tonnage tax. The fight was led by Mrs. Helen Schultz Brewer, well-known Iowa bus operator.

Much of the time in the presentation of the plaintiffs' side of the case was taken up with showing exhibits and other proof that hundreds of other vehicles ranging from heavy freight and passenger carriers down to taxicabs are using and wearing out the Iowa roads, yet pay no part of the tax because they are not operating on regular schedules but between fixed points.

Casper Schenk, counsel for the bus operators, charged that the law was class legislation and that it penalized regularly organized bus and freight lines while the great majority of commercially operated passenger and freight vehicles went tax free.

After hearing the evidence Judge Bonner took the case under advisement.

The first suit brought to test the legality of the tax resulted in a decision by Judge Lester Thompson of the Polk County District Court, in which he held the statute unconstitutional. Appeal was taken by the state and the Iowa Supreme Court ordered the case back to the district court for retrial on grounds that the lower court erred in allowing the facts to be stipulated instead of brought out by testimony.

Operators Come Out of Legal Excitement Unscathed

Bus operators in Georgia have new regulations to observe as a result of the passage of a new motor vehicles measure by the Legislature at its 1927 session.

If they are operating automobiles, the license charge will be made upon the basis of weight, the charge being 50 cents for each 100 lb. or fraction thereof. If they are operating buses they will find the charges the same as last year on a capacity basis, ranging from $15 to as high as $1,125 for heaviest trucks. Tractors, except those used exclusively for agricultural purposes, trailers, semi-trailers, and motorcycle side cars will be charged a license fee for the first time in the state.

The speed limit in Georgia has been increased from 35 to 40 m.p.h. for cars under 10,000 lb. For motor vehicles between 10,000 and 16,000 lb., the speed limits have been set at 8 m.p.h. for metal tires, 20 m.p.h. for solid tires and 25 m.p.h. for pneumatic tires. And for buses and trucks of more than 16,000 lb. weight, the speed limits are 5 m.p.h. for metal tires, 18 miles for solid tires and 20 miles for pneumatics.

Other attempts were made to tax bus companies, but all these failed in the closing days of the Legislature.

Line Between Lawrence and Lowell

The Eastern Massachusetts Street Railway, which has sought to establish a bus line between Lawrence and Lowell, Mass., for some time, has been successful in securing permission and the necessary licenses from Mayor Walter T. Rochefort of Lawrence, Mass. It is planned to start operations as soon as possible. All other municipal licenses have been secured and schedules are now being worked out. The line will operate via Tewksbury and Andover.

Fee Charged Intercity Buses

For the first time in four years intercity buses must pay a license fee in Chippewa Falls, Wis., according to the terms of an ordinance recently adopted that all buses operating in and out of Chippewa Falls must pay an annual license of $25 a year. The police department has been assigned the duty of enforcing the ordinance.

Rail-Light Company Protests Buses

A protest against the application of the Buckeye Stages, Inc., seeking to operate bus service between Columbus, Ohio, and Westerville, has been filed with the Public Utilities Commission by the Columbus Railway, Power & Light Company. The protestant declares that its system has provided ample service between these two points and that additional service could be provided.

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Financial *and* Corporate

Rail Earnings Continue to Show Profit in Pasadena

Continuous losses in income from the operation of buses in the city of Pasadena, Cal., are shown in the June report of the Pacific Electric Railway, recently filed with the City Directors of Pasadena. The report shows a loss of $10,559 for the month of June, while the first six months of 1927 shows a loss of $50,172.

During June, 141,247 bus-miles were traveled by the buses in Pasadena, the average earning was 0.1796 cent and the average expense 0.2403 cent. The number of passengers carried on the bus lines in June was 487,022 compared with 529,529 in June, 1926. The report shows 395,499 passengers paid fares, 76,612 rode on transfers and 14,951 rode free. Passenger earnings amounted to $25,107.

During the same time, the railway transportation in Pasadena has continued to show a profit according to the report, the net operating income for June being $6,328. Analysis of the passenger traffic on the rail lines for June showed a revenue of $26,271. A total of 486,012 passengers was carried, 410,395 paying fares, 56,381 riding on transfers and 19,236 riding free. The car mileage traveled was 104,237.

New Bedford Line Sold

Sale of the New Bedford & Onset Railway, New Bedford, Mass., to a New York group whose identity was not revealed, was announced on Aug. 24 by Elton S. Wilde, president of the Union Street Railway of which the Onset line is a subsidiary. Mr. Wilde asserted that the new owners plan to continue operation.

B. M. T. Fights Bond Decision

Seeking a rehearing on its petition the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., has taken issue with the Transit Commission for exceeding its authority in denying the application to issue $20,000,000 bonds of the New York Rapid Transit Company to be taken by the Brooklyn Company for $16,000,000. In denying the application the Transit Commission held that the sale of the bonds to the B.-M. T., which is the parent company, was among other things prejudical to the interests of the city of New York because of the city's partnership with the company in the routes on which the cars are to be used.

The application for a rehearing was considered and referred to counsel at the meeting of the commission on Aug. 31. This action on the part of the company is regarded merely as a formality precedent to an application to the Apellate Division for a writ. Among other things the company contends that Mr. Untermeyer, as special counsel, the commission and the city, said there would be no objection to the sale of $3,467,000 of the bonds at 80 for equipment for additional operation. Reference was made to this bond sale in the ELECTRIC RAILWAY JOURNAL previously.

Indiana Utility Would Issue Preferred Stock

The Northern Indiana Public Service Company, Gary, Ind., an Insull utility, has applied to the Public Service Commission for authority to issue $1,300,000 of preferred stock at 6 per cent. The proceeds, according to the petition, are to be used to reimburse the company's treasury for capital expenditures made up to Aug. 1 of this year, and for money used in the retirement and purchase of certain stock.

Plans Purchase of Pennsylvania Property

The Pittsburgh Railways, Pittsburgh, Pa., subsidiary of the Philadelphia Company, is negotiating for the purchase of the Homestead & Mifflin Street Railway, operating more than 3 miles in Homestead, Pa. Expenditures of $300,000 for improvements are planned if the purchase is completed.

Indiana Line Sold

The real estate, right-of-way and rolling stock of the Fort Wayne & Decatur Traction Company, Decatur, Ind., has been sold to the Indiana Service Corporation of Fort Wayne. The line, 22 miles long, ceased to operate cars on Aug. 9 by authority from the Public Service Commission. Electric power will be continued to Decatur and intermediate points by means of the high-tension line now in service. The work of tearing up the rails will begin soon. Equipment from two substations, which will be removed, will be placed at points on the Indiana Service Corporation lines.

$7,000 for Batavia Property

The S. Snyder Corporation of Rochester, N. Y., has closed negotiations for the purchase of the physical property of the Batavia Traction Company, Batavia, N. Y., and will begin to dismantle the road immediately. Although no price was announced, it is believed approximately $7,000 was paid for the property, which includes six cars and other equipment. The Batavia Traction Company operated 5 miles of line.

Combined Surplus in Porto Rico $925,572

The net income of the Porto Rico Railways, San Juan, P. R., for 1926, after providing for depreciation, amounted to $426,026. Income derived from other sources, $9,938, made the total net income $435,964. These facts were contained in the twentieth annual report.

Interest on first mortgage and refunding mortgage bonds for the year absorbed $174,329. Provision has been made for the preferred stock dividend for the year, amounting to $70,000, and a dividend on the common stock, amounting to $30,000, paid January 15, 1927. The balance of $141,635 has been added to surplus account, which has been carried forward at $925,572. The amount of first mortgage bonds outstanding was reduced during the year by the sum of $66,500, in compliance with the terms of the trust deed.

CONSOLIDATED STATEMENT OF PROFIT AND LOSS OF THE PORTO RICO RAILWAYS, LTD., FOR YEAR ENDED DEC. 31, 1926

Net profit from operation for year after providing for depreciation		$426,026
Add: Net income from other sources		9,938
		$435,964
Less: Interest on bonds—		
First mortgage bonds	$109,845	
Refunding mortgage bonds	64,483	
		174,329
		$261,635
Less: Income tax accrued		20,000
		$241,635
Deduct: Dividend on preferred stock	$ 70,000	
Dividend on common stock	30,000	
		100,000
		$141,635
Add: Balance at credit Dec. 31, 1925	$794,926	
Less amount applicable thereto	10,989	
		783,936
Combined surplus carried forward		$925,572

The current assets as of Dec. 31, 1926, including bonds purchased for future requirements of the sinking fund, amount to $814,284, against $702,298 in the previous year. Current liabilities stand at $426,139, compared with $336,618 a year ago. The net working capital of the company has thus been increased by $22,466, and now amounts to $388,144. During the year there was expended on capital account the sum of $158,044, mostly for additions in power and light divisions.

More New Jersey Stock for the Public

Another campaign for the sale of the company's 6 per cent cumulative preferred stock to consumers will be put into effect in the fall of this year by the Public Service Corporation of New Jersey. The sale will be under the supervision of Charles G. Colyer, vice-president of the Public Service Stock & Bond Company, a subsidiary. The total number of preferred stockholders has increased from 2,763 in 1921 to 55,253 on Dec. 31, 1926.

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General Engineering Concern Disposes of Utility Holdings

The World Engineering Corporation, Boston, Mass., engaged in the business of construction and appraisals, has announced through its president, Carl M. Pihl, the disposition of its public utility holdings to the J. G. White Management Corporation, 33 Liberty Street, New York City, N. Y. The holdings include the Derry Electric Company, Derry, N. H.; Yarmouth Light & Power Company, Ltd., Yarmouth, Canada; West Virginia Light, Heat & Power Company, Sistersville, W. Va., and the Sistersville & New Martinsville Traction Company, Sistersville.

Louisville Properties Valued at $28,393,734

Report of the Beeler Organization on the appraisal of the properties of the Louisville Railway, Louisville, Ky., made public by members of the Board of Public Works, recently, showed the total property values of the company to be $28,393,734. There was a depreciation of $3,944,952 on the grand total, leaving a balance of $24,448,782, which is considered the sound property value which will be used as a basis for fixing the rate of fare to be charged by the company in the future.

In making the report public members of the Board of Works refused to comment on the contents as did James P. Barnes, president of the Louisville Railway. Mr. Barnes and Charles Milner, counsel for the railway, conferred with members of the board regarding the report, but did not have time to study its contents. It will be three or four months before the board will be ready to make a statement, according to David R. Castleman, chairman. The report in four large volumes dealt with every phase of the management and operation of the Louisville Railway. A copy of the report was turned over to George W. Hubley, engineer for the Public Utilities Bureau, with the request that he make a study of the contents in order to advise members of the board regarding various items prepared by representatives of the Beeler organization.

Michigan Line Abandoned

The Marquette County Electric Railway, operated under the management of the Michigan Gas & Electric Company, suspended operations on Aug. 20 for an indefinite period. The Twin City Motor Bus Company, managed by W. J. Billing of Ishpeming, Mich., has arranged its bus schedule to follow as closely as possible the route of the cars, with half-hour service between Negaunee and Ishpeming.

The railway has been operated under numerous managements since July 1, 1892. One of the chief obstacles to the successful operation of the road has been the severe winters. Often only summer schedules were maintained. With the impoverished cars and the inability to add new ones, the company intends to junk the equipment.

$300,000 Value for Sedalia Railway

The Missouri Public Service Commission on July 2 fixed the valuation of the property of the City Light & Traction Company, Sedalia, Mo., at $1,765,000 as of Dec. 31, 1925. The figures for the various departments follow: Electrical department, $1,045,000, including $950,000 for physical property and $95,000 for going value; gas department, $420,000, including $400,000 physical property and $20,000 going concern value, and railway department, $300,000 for physical property and no going concern value, because the lines are being run at a loss.

The property was valued in connection with an application for an increase in rates for gas service in Sedalia. The commission denied the application, holding that present rates are fair and will be continued.

The order stated that the commission in fixing going value had been controlled by the circumstances surrounding each department. The state body said that slow growth of the city in recent years did not indicate immediate prospects of a substantial increase in business or extension of service except in the electrical department.

Foreclosure Decree for Massachusetts Properties

Hearing has been given by Judge Sanderson in the Massachusetts Supreme Court on the form of a decree for foreclosure by the American Trust Company of a $2,500,000 mortgage on the Boston & Worcester Street Railway, Framingham, Mass., securing a $2,460,000 bond issue, and a mortgage of the Framingham, Southborough & Marlborough Street Railway, securing $60,000 bonds. It is understood bondholders will purchase the two lines.

The framing of a decree satisfactory to Judge Sanderson involves many details not yet worked out, and counsel has informed the court that the sale cannot be made before six weeks after the decree has been entered. The upset price to be named in that decree by Judge Sanderson is agreed upon as $360,000, and the purchaser will have to provide about $180,000 in cash to meet expenses and charges. Counsel reports that a deficiency of $90,000 still exists in the finances of the Boston & Worcester in spite of the good work done by Franklin T. Miller as receiver.

Oklahoma Line Suspends

The Chikasha Street Railway, Chickasha, Okla., recently suspended operations because of its inability to meet expenses.

$23,083,776 Depreciated Value Found for Nashville Properties

The railway and electrical properties of the Nashville Railway & Light Company Nashville, Tenn., are valued at $26,046,773 as of July 1, 1926, in the report to the Railroad and Public Utilities Commission by the special investigation committee composed of William J. Hagenah, Chicago, and Prof. Albert S. Richey, Worcester, Mass.

The committee was appointed by the commission at the request of the local utility company. The report covers two years of research and computation work. In it the engineers declare that the properties of the company are in good condition, without delayed maintenance, and giving an excellent service to the public.

The estimate of the local properties covered a detailed study of every department of the company, its bulidings, tracks, ties, poles, rolling stock, motors, power plants and itemized valuations of every piece of property. The report made to the commission shows an initial cost of $16,843,201 for the properties, which the statistician declared would cost about $1.65 for every dollar expended at the time of the establishment of the company and its properties in Nashville.

The depreciation on the $26,046,773 total valuation as of July 1, 1926, would amount to approximately $3,000,000 or in detail a total of $1,918,919 on the railway properties and $1,044,148 on the electrical properties. This leaves a net valuation of $23,083,776 for the company's entire holdings in the city.

The report showed that the local company had expended approximately $3,418,000 for repairs and improvements within the past ten years.

Hocker Line Sold for $28,500

The Hocker line, officially known as the Kansas City, Lawrence & Topeka Electric Railroad, Merriam, Kan., was sold for $28,500 to the Sonken-Galamba Corporation, Kansas City, Kan., at a special master's sale on the steps of the Johnson County courthouse at Olathe, Kan., on Aug. 26. The line has not been operating since July 16 following a receivership of eight years.

Nearly 300 residents of Shawnee, Merriam and other points along the line, which extends from Rosedale to near Zarah, Kan., were given a faint hope the Hocker cars would not be discontinued and the property junked. Herman Sonken, who made the successful bid for the line, said after the sale his concern would give a "reasonable" time for the citizens served by the road to take over the property for operation. If the offer is refused the line will be junked.

Lester Blanton, president of the Merriam Chamber of Commerce, said citizens would hold meetings in Merriam to plan an organization to operate the road. He blamed the service rendered for the failure of the line to operate successfully.

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Legal Notes

ALABAMA—*Injury to Passenger Trying to Board Car.*

Where a street car stops at a point with a manifest purpose of discharging and taking on passengers, it extends an invitation to that end, and it is the duty of those in charge of the operation of the car to exercise reasonable care and diligence that no person in the act of accepting such an invitation in the usual way is put in a dangerous position. Hence, a passenger, at a regular stopping point, whose hand was caught in the platform door when it was closed and was dragged some distance and was injured, could collect damages. [Birmingham Electric Co. vs. Cleveland, 113 So., 403.]

CALIFORNIA.—*Disclosure of Names of Witnesses Not Obligatory.*

A section of the civil code requires an injured plaintiff to submit himself to physical examination and the defendent to permit the plaintiff's expert to examine the machinery alleged to have caused the damage. A section of the penal code requires the drivers of vehicles which have caused injury to give to the occupants of the vehicle or person injured the names of the passengers, not exceeding five, in the vehicle causing the injury. It was held that neither of these sections requires the motorman on an interurban car to give to the plaintiff in an action for damages the names of the witnesses obtained by him after the accident. [Barrington vs. Pacific E.R., 256 Pacific, 567.]

CALIFORNIA—*Motorman May Assume that Motorist Will Use Due Care.*

Where an autobus driver approaches a railway crossing coincidently with a railway car, the continuing duty rests upon him to use reasonable caution in protecting his passengers from collision. He must presume that the motorman of the car, in reasonable probability, would continue up to and over the crossings without slowing up. The motorman may presume that the autobus driver approaching the railway crossing will use due care and need not check the otherwise rightful speed of his car in passing such crossing until he has reason to believe that the bus driver is neglecting to use care. [McCarthy vs. Pacific Elec. Ry., 255 Pac., 868.]

KENTUCKY—*Several Charges to Bus Lines Not Double Taxation.*

The law imposing a franchise tax on companies possessing special privileges from the State was held to cover bus lines. Charges for use of the highway can also be collected from them by the State under its police power, provided these charges are intended for the repair of special injuries to the highways caused by the operation of the buses. Additional charges can also be collected to help to defray the expenses of administering this law. These several charges do not constitute double taxation which is prohibited under the Kentucky constitution. The fees mentioned for the use of the highway, etc., may properly be measured by capacity and weight, as well as a charge for the tag required for each of them. [Blue Coach Lines vs. Lewis, et. al., 294 S.W., 1080.]

ILLINOIS—*Policy on Issue of Certificates Defined.*

It is the policy of the State, established by legislation for the regulation of public utilities, to provide the public with efficient service at a reasonable rate by compelling established utilities occupying a given field to provide adequate service and at the same time protect them from ruinous competition. Where an additional or extended service is required, and a utility in the field is willing and able to furnish the required service, the Commerce Commission is not justified in granting a certificate of convenience and necessity to a competing utility until the existing utility has had an opportunity to demonstrate its ability to give the required service. While priority in the field is an element to be considered, it will not of itself govern the granting of the certificate. Where the extension of service of an existing utility was required and it proposed to furnish that service only by transfering passengers at a point which was without adequate facilities for the necesities and convenience of passengers while awaiting transfer, the Commission was warranted in granting a certificate to another company which was willing to give through service. [Bartonville Bus Line, vs. Eagle Motor Coach Company, 157 N.E., 175.]

MASSACHUSETTS—*A Utility May Be Responsible for Passenger's Injury.*

A street railway, as a carrier of passengers, may be liable for negligence in failing to warn a passenger of danger in alighting from its car or in failing to see that he alights in safety.. [Williamson vs. Boston Elevated Ry., 156 N. E., 21.]

MASSACHUSETTS. — *Responsibility Defined for Construction Defects in City-Owned Subway.*

The Tremont Street subway was constructed by the Boston Transit Commission, which ceased to exist in 1918, all of its powers and duties being imposed on the city of Boston. The subway is now owned by the city, which derives a return from it. The service in the subway is supplied by the Boston Elevated Railway. A passenger was injured by falling into an open space left in the original construction between the station platform and the car body and brought suit against both city and company. The latter was held not responsible, as the platform was designed and constructed by public authority, and the city also was not responsible because the subway is a public enterprise for the general welfare, hence the city cannot be deprived of the defenses which are open to the public agency in undertakings of this kind. [Bartol, vs. City of Boston and Boston E.R., 156 N. E., 844.]

NEW YORK—*Motorman Held Not Responsible for Pedestrian's Acts.*

A pedestrian who, in crossing a street between blocks, stepped in front of an approaching car 20 to 25 ft. away, and was struck by the near corner of the car, was held guilty of contributory negligence and motorman was not held negligent, as he was not required to anticipate the pedestrian's acts. [Schneller vs. Ninth Ave. Ry., 220 N. Y. Supp., 434.]

MINNESOTA—*Railway Not Liable for Injuries to Repairer of Fire Alarm Wire Attached to Its Poles.*

A fire alarm wire was attached to a railway pole without the company's express consent, though without its objection. When the wire broke a person not an employee of the city but with the consent of the fire department began to make repairs and was injured when the pole broke. The company had not given permission to anyone but its own employees to climb the pole and was held not liable for the injuries. [Howard vs. Minneapolis & St. P. S. R. Co., 214 N.W., 658.]

MISSOURI—*Duty of Pedestrians When Crossing Street to Look and Listen.*

In order not to be guilty of contributory negligence, one must, before entering on a street railway track, look and listen in both directions for cars, provided by looking and listening he could discover their approach. Where the view of a person is obstructed as he approaches a railroad track, he must look in both directions for approaching cars after he passes the obstruction and reaches a point from which looking would be rendered effective. [Zlotnikoff vs. Wells, 295 S.W., 129.]

MISSOURI—*No Damages Allowed for Mental Distress.*

No recovery can be had for fright, terror, anxiety or mental distress caused by negligence, where unaccompanied by any personal injury, or for personal injuries caused solely by mental disturbances without external impact. [Gibbon vs. Wells, 293 S. W., 89.]

WASHINGTON.—*Commission May Anticipate Future in Granting Certificates.*

In granting certificates of convenience and necessity, allowing the operation of motor transportation companies under the State Law, the Department of Public Works may anticipate the future as well as consider the present necessity and convenience. Such action was upheld as regards a district not completely served by a railway, although the latter was not given a special opportunity to furnish increased facilities before the competing carrier was licensed. [Northern Pacific Ry. et al. vs. Department of Public Works, 256 Pacific, 333.]

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Personal Items

Walter J. Cummings New President of Chicago and West Towns Railway

Walter J. Cummings, an outstanding figure in the industrial and civic life of Chicago and president of the Cummings Car & Coach Company, was elected president of the Chicago & West Towns, Railway, Oak Park, Ill., on Aug. 22, succeeding the late ex-judge Willard M. McEwen. The new incumbent's connection with this railway

W. J. Cummings

property dates back to 1913. He has been chairman of the board since 1918.

As manufacturer and operator Mr. Cummings knows the railway business, senses its needs and has confidence in its future. His active interest in the electric railway industry dates back approximately twenty years when the successful foundry and forging business that had been built up by the Cummings brothers was expanded through the purchase of the McGuire Manufacturing Company, well-known manufacturer of trucks and sweepers.

Later with the addition to its line of products of a gas-electric bus for supplementary railway service, the name of the company was changed from the McGuire-Cummings Manufacturing Company to the Cummings Car & Coach Company. In 1904 Mr. Cummings became vice-president of the McGuire-Cummings Manufacturing Company and president in 1918. His ardent belief in the future of the railway business was expressed in an interview published in ELECTRIC RAILWAY JOURNAL for March 27, 1926. He has steadfastly held to the view that the essential nature of the service rendered by the electric railway made its position fundamentally sound. He believed that the bus added a new and valuable agency for handling the type of service that did not justify railway construction and contended that bus operation by electric railways need not be a losing venture when approached from the proper viewpoint.

Mr. Cummings was born on June 24, 1879, at Springfield, Ill. His early training was in the banking business. The Chicago & West Towns Railway, over which he now assumes executive control, operates 67 miles of electric railway in the section lying just west and southwest of the Chicago. In addition, it owns more than 7 miles of track which are leased to the Chicago Railways Company. The company also operates bus lines supplementing its railway service.

G. I. Wright, Engineer of Electric Traction at Reading

G. I. Wright has been appointed to the new position of engineer of electric traction of the Reading Railroad, Reading Pa.

Following his graduation from Leland Stamford University in 1913 as an electrical engineer he was employed by the Southern Pacific Railroad in connection with the electrification of branch lines. He left that post in 1917 to enter the United States Navy, being appointed electrical officer of the *U. S. S. Montana* after a course of instruction at the Naval Academy. In August, 1918, he was promoted to lieutenant and sent to the Portsmouth Navy Yard to supervise the construction of several submarines.

He resigned from active duty in February, 1919, and for three years was construction superintendent of the Duluth Edison Electric Company, at Duluth, Minn. Following this, he was employed by the Illinois Central Railroad as assistant engineer in charge of electrifying their Chicago Terminal. He was with that company for five years, during which time he was promoted to office engineer and handled all features of that work.

C. H. Forsgard in Toledo. Other Changes in Line-Up

Charles H. Forsgard, who has been made general superintendent of the Community Traction Company, Toledo, Ohio, and given direct supervision of the operations of the company, has been in the service of electric power and railway properties ever since his graduation as an electrical engineer from the Texas Agricultural and Mechanical College in 1911.

Mr. Forsgard is a native of Waco, Tex. His first work was with the Houston Light & Power Company, controlled then by the United Gas & Electric group. Later he went into the Texas Panhandle district to manage three small properties for a Boston financial group. In 1917 he went to the Weston Light & Power Company, in Colorado, later taken over by Henry L. Doherty & Company. Here he remained with this property for seven years and then was transferred to Durham, N. C., in an executive capacity with the Doherty utilities there.

In his new capacity at Toledo, mention of which was made in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 13, page 290, he will relieve J. Frank Johnson, vice-president and general manager of the company, from many of the details of operation, permitting Mr. Johnson to take a greater part in the promotion of public relations and general policies of the company.

In the change E. V. Emery, who has been transportation superintendent of the company, will go to the New York offices of Henry L. Doherty & Company.

C. H. Forsgard

Sidney L. D. Jackson, attorney who has been with the law firm of Tracy, Chapman & Welles, general counsel for the company, has also been added to the claims staff of the Toledo company to assist Attorney Donald Finkbeiner.

OBITUARY

WILLARD M. MCEWEN, president of the Chicago & West Towns Railway, Oak Park, Ill., died suddenly on Aug. 18 at his summer home at Ephraim, Wis. Mr. McEwen was an ex-judge of the Superior Court of Cook County and a former law partner of United States Senator Charles S. Deneen. Recently, Mr. McEwen was in the limelight when he directed the litigation of the now famous bus case which resulted in the ruling of the Illinois Supreme Court to the effect that the State Commission must give preference to able existing utilities over those desiring to compete.

HARLEY W. BRUNDIGE, for eight years a member of the California State Railroad Commission, died on July 16. It was in 1919 that Governor Stephens named him to the commission. Prior to that time he had been engaged in journalism, the career he chose after leaving college. His first editorial experience was in Missouri, where he attained distinction. He later went to California and filled several important positions in the newspaper field. Mr. Brundige was born in Ohio in 1865.

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Manufactures and the Markets

New Electric Rolling Stock in England

Hitherto the London, Midland & Scottish Railway has employed on its London suburban electrified lines cars open internally from end to end with end and center doors. These are in general similar to those used on the London tube railways and are employed in through service between the Baker Street and Waterloo Railways and Watford on the L. M. S. line. This was started before the railway amalgamations, when the Watford route was part of the then London & North Western Railway. On the other hand the Southern Railway has on its London suburban electrified lines (Brighton section) compartment cars similar to those employed on the steam railways. With this idea in mind the London, Midland & Scottish Railway in its latest order for additional cars has chosen the compartment type. The vehicles are arranged in three-coach units as usual, but two or more units can be coupled up when long trains are required during the busy periods. The new order embraces 28 third-class motor cars, 24 composite trail cars and 23 third-class control trail cars. The body length of motor cars is 59 ft. and of the others 57 ft., with a body width in each case of 8 ft. 11 in. The centers of the bodies are 39 ft. apart. The unladen weights of each type are respectively 56 tons, 28 tons and 30 tons, while the seating accommodation is for 84,100 and 96 passengers respectively.

The bodies are of No. 14 gage channel finish galvanized steel and the floors are of galvanized steel sheets covered with decolite. The seating is after the usual British steam train type. In general, it may be said that the cars conform largely to standard practice.

Economic Problems Before Chamber of Commerce

The part organized business is to play during the forthcoming year in the solution of outstanding economic problems, such as agriculture, flood control, taxation and merchant marine, will be shaped at a meeting of the national councilors, committees and board of directors of the Chamber of Commerce of the United States to be held at West Baden Springs, Ind., Oct. 15 to 18.

It will be the first meeting of the kind to be called by the national organization and the first conference on questions of national economic policy to be held in the environment of the Middle West. The meeting place has been deliberately chosen with a view to affording business interests of that region the widest possible opportunity to present their views on current economic and legislative problems.

The West Baden meeting will, it is expected, bring to a focus opinion of business executives representing organizations in every state. Invitations have been extended to more than 1,000 national councilors, each representing a trade association or commercial organization in the membership of the national chamber, and approximately 200 officers, directors and members of special committees dealing with particular phases of business activity.

Norfolk Receives Five New Buses

Five new 21-passenger buses have been placed in service at Norfolk, Va., by the Virginia Electric & Power Company, Richmond, Va. They have replaced five buses on the Navy Yard routes. The old equipment will receive a general overhauling and renovation. The routing of two trolley lines, the Craddock and the Park View lines, have been changed by the company.

C. V. Marks Hurt in Fall at Ohio Brass Plant

C. V. Marks, treasurer of the Ohio Brass Company, Mansfield, Ohio, on Aug 5, was severly injured in a fall down an elevator shaft while inspecting the company's new office building. He suffered several broken bones, which will incapacitate him for some time. His friends in the industry will be glad to learn that apparently no internal injuries resulted and that he is doing very well.

Pre-Convention Flashes

from Cleveland

THERE was an enthusiastic meeting of the decorations subcommittee of the A.E.R.A. exhibit committee in Cleveland last week. Fred Dell, director of exhibits, looked wise and mysterious but said very little about the plans formulated at the pow-wow, which was held in the office of Col. J. H. Alexander, president of the Cleveland Railways. A JOURNAL man after much inquisitiveness unearthed that they were going to decorate the decorations under the big roof, and also that miniature artist models of the buildings were approved. Sumpins' in the wind, but the wind ain't blowin' this way.

Speedy and early shipment of cars exhibited on the track section at Cleveland will greatly facilitate the work of the sub-committee which recently met in Cleveland and tentatively laid out the arrangement of the cars.

I. R. T. Receives Large Shipment of Electric Snow Melters

The Interborough Rapid Transit Company of New York City is receiving from the Westinghouse Electric & Manufacturing Company more than 1,060 snow melter units for railway track switches. The shipment is the largest ever made to one company and is the third order of this equipment for the I.R.T. The company will have 3,200 units in use when these are installed.

Electric snow melters have been used by many transportation companies during the past two years and have given exceptional service by keeping track switches open and operating during heavy snow and sleet storms. During the terrific blizzard of February, 1926, when more than 12 in. of snow fell in less than a day, the heaters gave excellent service.

These units are so installed that sufficient heat is generated at the important points of each switch to prevent the collection of snow or the formation of ice. Each switch group of heaters is individually connected to the power line by a fuse and single-throw switch and the yard men can turn them on whenever occasion demands. This simple method of keeping the track switches clear forestalls possible tie-ups of service during sudden storms and removes the necessity of recruiting a large force of men upon short notice.

Construction Commenced on Warehouse for Kansas City Lines

The Kansas City Public Service Company started excavations on Aug. 11 for a large warehouse and office building at the southeast corner of 40th and Summit Streets. The building will house the equipment and working force of the construction department.

The ground dimensions of the warehouse will be approximately 75 ft. by 135 ft. and a part of the planned structure will be two stories high. The two-story portion of the building will be about 75x100 ft. in area and it will contain the locker rooms for the employees of the construction department, of which there are about 100. The ground floor will be used for the protection of welding machines and other valuable equipment of the department.

Due to the considered setting back of Summit Street for a traffic way, the building will be built 30 ft. from the present Summit Street.

A tentative agreement between officials of the city and those of the Public Service company has been reached, it is understood, whereby the company would not oppose the widening of Summit Street through its Westport yards, which are extensive.

The proposed trafficway would start at 38th Street and cut through residential property at 39th Street east of the intersection of Summit and 39th Streets, to avoid cutting into large business and apartment structures at the intersection.

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If this plan is followed the traffic way would enter Summit Street proper at about 40th Street, where the new warehouse and office building is located.

Quiet Week in Metals but Copper Picks Up

Copper has sold in much better volume than for several weeks, and prices have taken a turn for the better; other metals, however, have been quiet, with lower prices for lead and tin. Zinc has had an unusually quiet market, but prices have held.

The tone of the copper market is perceptibly better. Again in the week ending Aug. 31, as in the two previous weeks, most of the large sellers have refused to quote below 13¼ cents, delivered to usual Connecticut points, though business has been taken in certain directions as low at 13.05 cents. In fact, resale lots of spot copper have been sold in the New York district for as low as 12.95 cents cash. However, the cheaper offerings have become less in evidence and on Aug. 31 it was difficult to find anything under 13.20 cents delivered Connecticut, and as early as Aug. 29 some sellers got the full 13¼ cents.

The week's trading in the lead market opened very feebly and consumers showed little or no interest; small lots were sold at prices ranging from 6.15 to 6.17 cents per pound f.o.b. St. Louis. On Aug. 30 the American Smelting & Refining Company again reduced its contract price: it will be remembered that this was fixed at 6.60 cents and Aug. 24. The present reduction brings the price down to 6.50 cents, New York. Corroding grades command a premium of $2 to $3 per ton over common load.

The week ended Aug. 31 has been the quietest week of the summer for zinc, practically no sellers doing their normal volume of business. The price has fluctuated between 6.225 and 6.30 cents St. Louis. New York prices on Prime Western continue at the usual premium of 35 cents per 100 lb. over St. Louis.

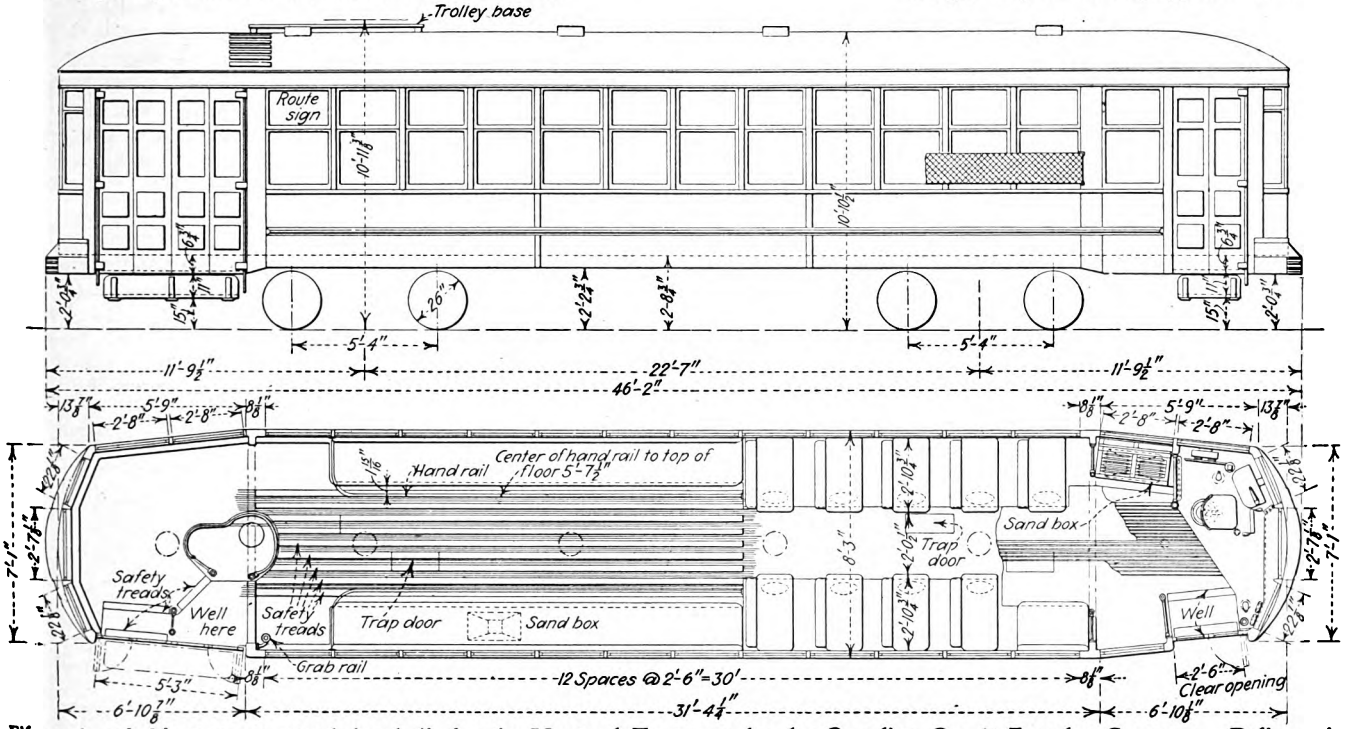
Only small fluctuations in the price of tin have occurred. Identical prices obtain for spot, September, and October tin, and there is a small premium amounting to one-quarter of a cent on November and half a cent on December deliveries.

50-Car Order for Montreal Tramways Placed June 14

As forecast in ELECTRIC RAILWAY JOURNAL for Feb. 19, 26 and March 12 an order for 50 two-man, city type, single-end cars has been placed by the Montreal Tramways, Montreal, Canada, with the Canadian Car & Foundry Co.

In announcing the signing of this contract, dated June 14, D. E. Blair, general manager of the tramways, states that the units are to be constructed along the general lines adopted for the 50 one-man cars built last year. "The length," writes Mr. Blair, "has been increased 5 ft. and the rear platform arranged for normal two-man operation. By using aluminum for side posts, girder plates, wainscoting and other trim, the weight of the cars will be no greater than that of the one-man cars, namely, 36,000 lb., complete with trucks and four 42 hp. motors on 26-in. wheels."

The units, each seating 44 passengers, will be painted the same standard green color as the other two-man cars now in service. Owing to their light weight they will be equipped with West-



Fifty units of this type are now being built for the Montreal Tramways by the Canadian Car & Foundry Company. Delivery is expected in September. Aluminum alloy will figure largely in their construction.

Number of units	50
Type of unit	Two-man, motor, passenger, city, single end, double truck
Number of seats	44
Builder of car body, Canadian Car & Foundry Co.	
City and state	Montreal, Canada
Date of order	June 14, 1927
Date of delivery	Sept. 30, 1927
Weights:	
Car body	19,350 lb.
Trucks	10,000 lb.
Equipment	6,650 lb.
Total	36,000 lb.
Bolster centers	22 ft. 7 in.
Length over all	46 ft. 2 in.
Length over body posts	31 ft. 4½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	10 ft. 11⅛ in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Air brakes	Westinghouse variable load
Armature bearings	Plain
Axles	4½ in.
Car signal system	Faraday
Compressors	Westinghouse
Conduit	Metal
Control	K-35
Couplers	Bar
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	End, folding
Fare boxes	Coleman
Finish	Enamel
Floor covering	Wood slat with Kass strips
Gears and pinions	Nuttall B.P. helical
Glass	21 oz.
Hand brakes	Peacock staffless
Heat-insulating material	Hair
Heaters	Electric
Headlining	⅛-in. Haskelite
Interior trim	Cherry
Journal bearings	Plain
Journal boxes	Cast iron
Lamp fixtures	Keystone compensating
Motors	Four Westinghouse 510-A-2, inside hung
Painting scheme	Green and cream
Roof material	Wood and canvas
Safety car devices,	Doors interlock brake and line switch
Sash	Brass
Seats	Ottawa Car Manufacturing Company
Seat spacing	30 in.
Seating material	Rattan
Slack adjusters	Westinghouse
Steps	Folding
Step treads	Mason
Trolley catcher	Keystone
Trolley base	Nuttall U. S. 20
Trolley wheels	Ideal
Trucks	Canadian Car & Foundry 790-F
Ventilators	Railway Utility
Wheels	Cast iron, diameter 26 in.
Wheelguards	H-B
Special devices	Heaters thermostatically controlled

Side posts, corner pillars, wainscoting, girder panels and miscellaneous body parts of aluminum alloy. Floor framing of steel. Interior finish, window sills and posts, etc. of cherry wood. Floor two-ply wood with tar felt between.

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inghouse variable load brakes. Operation of doors will be interlocked with the line switch and air brakes.

Delay in placing the contract, as indicated in the JOURNAL'S issue of March 12, was occasioned by a desire on the part of the Montreal Tramways Commission to consider the advisability of designing a triplex car, also because of the commission's views on further orders for one-man operated units, to which it was in no way committed by reason of the cars of this type ordered last year.

Quincy Mayor Pilots New Trolley

During a recent trial run of one of the de luxe model cars purchased by the Eastern Massachusetts Street Railway, Boston, Mass., for operation on its Quincy, Mass., division, Mayor Thomas J. McGrath relieved the veteran motorman operating the car, at the suggestion of John H. Hayes, local manager of the company. The party on the try-out run included several representatives of the company, the city and the Quincy *Ledger*.

The cars, seven of which are to be used on the Quincy division, are being built at a cost of $15,000 apiece. Each will seat 44 persons. They are finished in mahogany and have dome floodlights and Spanish leather cushions.

ROLLING STOCK

SHORE LINE MOTOR COACH COMPANY, Michigan City, Ind., operating buses from Detroit to South Bend, where connection is made with electric trains of the Chicago, South Shore & South Bend Railroad, has received two White six-cylinder buses.

EASTERN MASSACHUSETTS STREET RAILWAY, Boston, Mass., has received four White buses, model 50-B.

LEAVENWORTH TRANSPORTATION COMPANY, Kansas City, Kan., has accepted six Mack city-type buses, 25-passenger capacity, 196-in. wheelbase, with four-cylinder motors.

BOSTON ELEVATED RAILWAY, Boston, Mass., has placed an order with the Taylor Electric Truck Company, Troy, N. Y., for ten type L. R. H. double trucks, 5-ft. 2-in. wheelbase and 26-in. wheels.

GRAND RAPIDS, GRAND HAVEN & MUSKEGON INTERURBAN COMPANY, Grand Rapids, Mich., announces that the American Car & Foundry Company will deliver six 30-passenger parlor car type buses on Aug. 25, as the first units in the company's plan to co-ordinate electric rail and bus service. The dual service will be effective Sept. 1.

COUNTY TRANSPORTATION COMPANY, bus-operating subsidiary of the New York, Westchester & Boston Railway, New York City, has accepted delivery on seven Mack 29-passenger city type buses, 225-in. wheelbase, with four-cylinder motors for operation in Westchester County. Twenty-five Macks are now in service.

"An' the Gobble'-uns-'ll Git You

if you don't watch your step in signing up for the big Parade at

Cleveland, Oct. 3-8

Those little gobble'uns, "Regret" or "No Space Left" will be a-chasin' you for the next twelve months. Or if you keep pulling off a sound business move you may get the railroad end of a porter-house steak.

Exhibit Now and Rejoice at Leisure

FREDDIE DELL CAN TELL YOU HOW

TRACK AND LINE

HOLYOKE STREET RAILWAY, Holyoke, Mass., has completed the laying of new rails and the relocating of the track from the side to the center of the street for a total distance of 1 mile on Northampton Street. The work was in two sections, between Sergeant and Cherry Streets and between Hitchcock and Lawler Streets.

SAGINAW TRANSIT COMPANY, Saginaw, Mich., reports the reconstruction of tracks on South Michigan Avenue from the Michigan Central near Dearborn Street to Holmes Street as progressing rapidly. Service is being maintained by means of temporary track laid adjoining the curbing. The new work embodies the latest type of construction; that is, the placing of the steel rails on steel ties and completely imbedding them in solid concrete. It also involves the relaying of 3,400 ft. of track at an expense of $33,000. The new rail weighs 80 lb. to the yard and is 66 ft. long. Directly underneath the rail is an oak block that absorbs the vibration and noise. Thermit welding of the rail joints is one of the features of the rehabilitation program.

METAL, COAL AND MATERIAL PRICES—F. O. B. REFINERY

Metals—New York	Aug. 30, 1927
Copper, electrolytic, cents per lb.	13.013
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.55
Zinc, cents per lb.	6.275
Tin, Straits, cents per lb.	63.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20–5.70
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.5
White lead in oil (100-lb. keg), N.Y., cents per lb.	13.75
Turpentine (bbl. lots), N.Y., cents per gal.	63.0

TRADE NOTES

HASKELITE MANUFACTURING CORPORATION, Chicago, announces that in the new Twin Coach designed by F. R. Fageol, Plymetyl is used for 75 per cent of the surfaces, while Haskelite is used for the floor.

WILLIAM E. BROWN, manager of the central station department, New York district of the General Electric Company, has been appointed New York district sales manager. Mr. Brown's headquarters will be at 120 Broadway, New York.

J. G. BRILL COMPANY, Philadelphia, has transferred W. M. Horsell to the Philadelphia plant to represent the company's electric railway division in the southeastern territory. Mr. Horsell was formerly sales representative for the G. C. Kuhlman Car Company in the central states serving this plant of the Brill Company since 1920.

MANGANESE STEEL FORGE COMPANY, Philadelphia, announces the opening of a new office at 1335 Old Colony Building, Chicago, Ill., in charge of W. H Potter, formerly in the Philadelphia office.

A. H. FERRANDOU, formerly manager of motor coach sales for Dodge Brothers, has been appointed director of the motor coach division. Mr. Ferrandou's experience includes many years in the public utility business. He was an executive of the Washington Railway & Electric Company previous to joining Graham Brothers on June 1, 1925.

ADVERTISING LITERATURE

ACME STEEL COMPANY, Chicago, is mailing a folder describing Acme non-slip steel matting, which is used in machine shops and factories.

GOULD STORAGE BATTERY COMPANY, INC., Depew, N. Y., has mailed out a bulletin describing the new Gould kathanode storage battery.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, has just issued a booklet on the "Stable Arc" welder, which outlines the theory of the use of arc welding in production manufacturing.

MARKET DATA BOOK COMPANY, Chicago, Ill., tells of the Market Data Book, and how advertising agencies use the book, in a folder recently issued by it.

COPPERWELD STEEL COMPANY, Rankin, Pa., has distributed a folder describing Copperweld ground rods and ground wire attachments.

OHMER FARE REGISTER COMPANY, Dayton, Ohio, has mailed an announcement of the opening of its Philadelphia sales and service branch.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, September 10, 1927 *Number 11*

Co-operation of Manufacturers Will Insure Interest in Car Exhibit

WORD went out some time ago from the committee on co-operation with manufacturers calling attention to the importance of capitalizing to the utmost on the value of this year's car exhibit. Facilities for showing cars are better in Cleveland than they have ever been for an electric railway association convention. In the opinion of the manufacturers' committee, therefore, it is important that all manufacturers co-operate to insure that the maximum value be derived for the industry from the showing of cars while there is the opportunity.

The committee suggests that all manufacturers, whether or not they are directly interested in the production of cars or car parts, help to insure adequate attendance of visiting delegates at the car exhibits. The job is simple. First look at the cars yourself and study the development shown. Then talk about them to every delegate who will listen. Finally, urge the railway man who visits your booth, after he has seen your own exhibit, to be sure to inspect the new cars on display. Better still, if you can do so take him out personally to see the cars. Talk about them and point out the new things of interest. You will be doing something not only for the industry, but you will get a better understanding of the general situation and of the progress being made.

Ship Early to Exhibit Intelligently

IN THE ISSUE of this paper two weeks ago was published a résumé of the shipping instructions sent out by the exhibit committee for the Cleveland Convention in October. They were clearly detailed and they need no further comment. It is not in the method of shipping that a possible danger lies to the ultimate success of the exhibit, but rather in the question of early shipping and erection. One has but to recall the helter-skelter confusion of the first days of some of America's biggest exhibitions to have this evil of late shipping forcibly impressed upon the mind.

The exhibit that is partly completed after the official date of opening receives scant attention from early visitors. "I'll come back here later," they say—and then they don't. The whole business leaves a bad taste in the mouths of those for whom the exhibit is specially designed. By Friday evening, Sept. 30, every exhibit at Cleveland should be completed, and by noon on Saturday, booths must be ready for the visitors' inspections

Since last October the exhibit committee, from Colonel Alexander and Director Fred Dell down, has worked unceasingly to make the 1927 show an outstanding success. Unless one is familiar with the ramifications, the mass of detail and the real generalship necessary to promote a pageant of this character, he cannot appreciate the importance of complying with every suggestion contained in the committee's shipping and arrangement instructions, especially as at this moment the industry stands on the threshold of a new era of development in which the manufacturer will play a tremendous part.

In this connection for manufacturer and operator alike the JOURNAL can think of no better advice than that given by the Bard of Avon: "There is a tide in the affairs of men which, taken at the flood, leads on to fortune. . . . We must take the current when it serves or lose our ventures."

In other words, the tide of progress in our industry is at the flood of progressive ideas. Concretely expressed in exhibits these ideas may be weighed in the balance at Cleveland, if they are presented at the psychological moment. The half-filled booth, the confusion wrought by saw and hammer, will not contribute to an adequate presentation or a sober contemplation of these ideas. Ship early to exhibit intelligently.

Duplication, Alternation, or Co-ordination

HOW best to fit the bus into the general transportation scheme in the territory served by Public Service Railway of New Jersey has long been a difficult problem. Bus operation originally was developed by independent owners and no effort was made to avoid duplication of facilities already existing. On the contrary, practically every bus route was laid out with the deliberate intention of stealing the cream of the traffic from some railway route. This bus business expanded rapidly until the State Legislature passed an act which more or less checked further increase in the number of buses. The number in operation at the time of the passage of the law was so large, however, that the competition was ruinous to the railway.

Several years ago the parent company, the Public Service Corporation, with a view to co-ordinating rail and bus operation, organized the Public Service Transportation Company as a bus-operating subsidiary. Hundreds of the independent operators were bought out, but a small number demanded such exorbitant prices that the company declined to purchase their equipment and rights. The mixed ownership of buses was a stumbling block in the way of real co-ordination. It was obvious that improvement in transportation facilities could be accomplished by removing the buses to streets other than those on which the railway operated its cars, but the independents objected to any such change. A certain part of the public found the duplication of service to be convenient, and they also opposed any change.

Difference in the rates of fare on the cars and buses further complicated the situation. The independent buses, free of most of the financial burdens imposed on the railway, were able to give service at lower fares. On routes where this could not be done, the buses did not operate at all. The lower fare on the buses was a potent influence behind the public opposition to any change in route.

In this situation the best that the company was able to do was to develop a system of alternation. Schedules

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were arranged so that cars and buses operating on the same streets alternated with each other instead of running side by side from one end of the route to the other. This gave an even headway shorter than that which had previously been given by either the cars or the buses, and made it possible to save a certain amount of duplicate vehicle mileage. The result, however, was far from being a real solution of the transportation problem.

Recently a comprehensive survey of the whole transportation system in the city of Newark was made for the mayor by the engineering firm of Parsons, Klapp, Brinckerhoff & Douglas. An abstract of the report appears elsewhere in this issue. It goes straight to the heart of the matter and states unequivocally that there is no need for duplication of service on the same streets in this territory. Rerouting of buses to serve districts lying between the railway lines is recommended. Equalization of fares is emphasized as a necessary adjunct to this scheme.

Many other interesting points are touched upon in this report. Without minimizing the importance of the other phases, it may be said that the recommendations for coordination of bus and railway service are the outstanding features. These recommendations are now before the municipal authorities and it is to be hoped that active steps may soon be undertaken to bring about this desirable improvement in transportation facilities.

The Stone That Was Rejected

MICHELANGELO'S wondrous representation of young David was said to have been cut from a stone spoiled, rejected and abandoned as worthless by an unskilled workman. Many passed by this fine specimen of Carrara marble as it lay among the waste and rubbish on a street in Florence until the sculptor saw the beauty within. Likewise out in Kansas junk seemingly useless awaits only the touch of the reclaimer endowed with patience and skill sufficient to convert it into a thing of real utility.

Some twenty years ago this so-called interurban was placed in service. According to recent indictments, apparently well justified, its equipment and appurtenances, only lately retired from service, are reminiscent of that day. The road had never boasted a new car since its inception. When so-called new rolling stock did appear, it was transported from other properties willing to strike a bargain over second-hand equipment. That this floundering project would succumb in a flood tide of de luxe cars, fast schedules, trained employees and willing managements was inevitable. The enigma of a broken-down, neglected railway in the present era will answer partially, though belatedly, William Allen White's question "What's the Matter with Kansas?"

But a day of atonement may yet come for the sins of omission and commission on the part of this railway management, whether culpable or not. Efforts are being made to restore the service largely on the faith that local people have in the line. In this scrap heap there appears to lurk material replete with possibilities for creating a railway system which gives promise of serving all the better for its having been almost ruined. If in capable hands a thing of beauty can be made from material seemingly marred beyond redemption, may not a defunct railway, said to have failed not because of lack of patronage but through "ultra-conservatism," be fashioned into an up-to-date utility? There are many instances to prove that this hope is not unreasonable. And as the unveiling of "David" caused a great sensation, so may the hoped-for resumption of this road be celebrated with the appearance of de luxe cars ushering in a new régime with its shibboleth, "satisfied customers."

Another Good Report from Toronto

PROBLEMS not unlike those experienced in the conduct of private companies confront the municipality that attempts to run its railway system. This is apparent from the report of the Toronto Transportation Commission, digested elsewhere in this issue. The statement on the whole makes a very creditable showing. The commission, however, has felt called upon to issue a warning that extensions into unprofitable areas cannot be made without danger of having to raise the fare. A growing city with new suburbs and new subdivisions creates a problem in transportation. Householders are loath to move into a section not conveniently served by cars. The agitation for service grows and by and by must be met. As the Toronto *Globe* points out, if the commission supplies a service too soon, it will lose money, the deficit will pile up and cause borrowing. Borrowed money requires additional funds for the payment of interest. Thus the vicious circle grows. On this point the commission says:

> One of the most difficult conditions your commission has to meet is the constant demand for extensions of its rail lines and bus services into localities from which practically no additional revenue can be derived. While your commission recognizes its obligation as a publicly-owned utility to provide city-wide service, yet it must have regard for fundamental economic considerations if the present rates of fare are to be maintained. The revenue from the universal fare system has varied only slightly from year to year. The problem of administering the system would be greatly simplified if there were a moderate and consistent yearly increase in revenue.

The *Globe* also shows that the system on an average fare of 6.16 cents pays its way, provides for depreciation, wipes out almost $1,000,000 yearly on "intangible assets" for which the city had to pay in acquiring the system, and has a surplus of $76,961, or a little more than one half of 1 per cent on the gross income.

This, of course, is a comfortable but not a buoyant condition. The competition of private motor cars constantly cuts into revenues and it is not likely to decrease in the slightest. As the commission has made plain, improved business conditions contributed last year to the increase in revenue. Despite this, however, 5,500,000 fewer passengers were carried in 1926 than in the record year established in 1923. The increase in gross income over 1925 was partly due to the increased development of motor coach traffic and partly to the aforementioned improvement in the general business conditions in the Toronto district.

A difficult condition confronted the commission from the very inception of the municipal system. Money has been spent with a free hand, but one not too free. The conclusion of the *Globe* seems to be sound that for the immediate future the commission appears to be on safe ground without disturbing the fare. The service, generally speaking, is highly creditable. The personnel is, indeed, very able, but it never could have done the things it has done had it not been unusually free from political interference. In short, an able management has been left largely untrammeled, a condition under which the greatest success is assured by approximating the conditions of private enterprise.

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What European Departmental Organization May Teach Us

SEVERAL articles in recent issues of this paper on European street railway practice suggest the question whether railway companies in this country can learn much from foreign methods. In view of the far greater extent of electric railway development in America than in any other country and the ready exchange of information, is it not probable that Americans already know the best methods of electric railway operation?

Undoubtedly in number of miles and cars in operation, America leads other nations, but size is not necessarily synonymous with quality or even with opportunity for progress. For example, in the United States, the field of electric railway operation is so large that much of the manufacturing can be done in comparatively large quantities. This makes the employment of standardized equipment almost obligatory from an economic standpoint. But in Europe, because of high tariff walls, each country is largely dependent on its own production, and the demand for electric railway equipment in each is comparatively so small that the same advantages cannot be gained from standardization. Hence there is greater diversity of practice, and possibly for this reason more opportunities of finding a new and better way of carrying out a certain task. In the form in which this method is used abroad it may not be always directly applicable to American conditions, but it may often suggest a method which would be suitable.

The leading European article this week relates to company organization. Most American managers are accustomed to think that a company organization must be largely along certain lines, but here is a railway company with the responsibilities grouped in quite a different way, yet functioning very successfully. Briefly, there are only three general departments, which may be defined as (1) financial and secretarial, (2) operation and engineering, and (3) legal and executive. In this country, the first and second would be divided into at least two each, often with three or four departments to cover "operation and engineering."

A second interesting feature of the Paris organization is the position given in the departmental arrangement to research work. There are two independent research departments, each along quite separate lines. One handles transportation methods and also has the duty of compiling the schedules. But in both this and its transportation research work it is entirely independent of the transportation department, reporting directly to the manager of operation and engineering. The other research department is devoted to technical research, and it is as independent of the engineering department as the department of transportation research is independent of the transportation department.

From the American standpoint there may be some objections to this plan, but at least it seems to give both research departments a freer field for action than if that devoted to transportation research reported to the superintendent of transportation and that on technical research reported to the chief engineer. This latter plan, usually followed here, means that recommendations for a change in either engineering or transportation methods, based on research, have to originate in the department concerned; in other words, they become essentially the criticism of a superior by a subordinate. In the more independent departmental arrangement used in Paris, this objection does not hold. In practice, it may not be a serious one, but it is worth considering. Still another interesting feature in the organization is that departments or sub-departments to discover better ways of doing things are not confined to transportation and engineering. The executive department also has its research department, although its duties, as explained in the article, are not confined to studying new and better ways of carrying out administrative work.

The Battle of Smoke

SHOULD passengers on the street cars be allowed to smoke, or should the present rule against smoking be kept in force? In this manner *Two Bells,* the leaflet distributed on the cars of the Georgia Power Company, presents to its readers an old problem for discussion. The Atlanta company is asking for expressions of opinion on which it may base its decision to retain or amend the no-smoking rule. Years ago smoking was permitted under certain conditions. The no-smoking rule was adopted to please the majority of the car riders, but that was when few gentlemen and no ladies smoked in public. Now times and customs have changed and perhaps the opinion of the majority is different.

Atlantans are taking considerable interest in the controversy and are sending in many letters. Strange to say, most of the replies evade the main question to discuss a secondary one, the feminine angle of the referendum. A typical correspondent states, "Though I am too old to be classified a flapper I am not opposed to women smoking and I should like to ask, if the no-smoking rule were abolished, would ladies be permitted to smoke on the cars the same as men?"

The objectors are even more emphatic than those in favor of the change, as witness:

"What! Permit smoking on the street cars? I should say not! How would you like to sit next to a man who was smoking an old pipe or a cheap cigar?"

Although the subject is live at present in many cities it is not new. From an operating standpoint it is highly undesirable to set aside sections of a car, or worse still entire cars, for smokers, since it makes it difficult to distribute the load. There is also the problem of maintaining a smoking compartment in a sanitary condition. Patrons who advocate the no-smoking rule further maintain that smoking and carrying smoldering cigars, cigarettes or pipes in a car is improper and unreasonably unsafe. Some go further and hold that aside from the danger of filling the eyes and throat with smoke and subjecting clothing to sparks the habit has a baneful influence on "ethical purity." Smokers, on the other hand, claim that these arguments are not valid and that since they are in the majority the majority should rule.

Two Bells made a worthy comment on the argument in its opening statement, "This is going to be the battle of smoke, with plenty of the smoke of battle." While it may be settled there always will be the difference of opinion, as voiced on one side by those who hold that it is "the inalienable right of mankind, as guaranteed by the Constitution and the laws of the land, to breathe fresh and pure air, uncontaminated by unhealthful and disagreeable odors," and on the other side those who maintain "the inalienable right of man to indulge in a good Havana."

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Transportation Survey

Made in Newark

Rerouting of buses to reduce duplication of service, equalization of fares and curtailment of parking are recommended in engineers' report. Desirable development of rapid transit facilities outlined

FROM the traffic and transportation standpoint as well as economically and commercially, the city of Newark, N. J., is an integral part of the New York Metropolitan area. With a population of 465,000, together with widely diversified industrial and commercial activities, it ranks as the most important sub-center in this district. At the same time Newark is a fully developed city, with its own business and residential areas, and must be considered also as an independent center. Transportation problems arising from this situation have been the subject of several months study by Parsons, Klapp, Brinckerhoff & Douglas, engineers, New York, N. Y., and a comprehensive report recently has been submitted to the municipal authorities.

To further the growth of Newark as a business center, the report states that three distinct classes of service should be developed: First, a local service of existing buses and trolleys, confined essentially to Newark and the immediate vicinity; second, a de luxe or semi-de luxe bus service operated to towns and cities outside of Newark and centering in the business and shopping districts; third, a rapid transit system arranged to co-ordinate with the local trolley and bus systems and with the commuter service on the steam railroads and the Hudson & Manhattan tubes.

Rerouting of Buses Needed

On the main thoroughfares in and out of the central business district of the city the report states that trolleys now carry approximately 34 per cent of the total traffic, buses 33 per cent and passenger automobiles, including private vehicles and taxicabs, 33 per cent. Traffic checks, however, show heavier loading of the buses than of the trolleys on a number of routes where both occupy the same streets. That trolleys and buses are operating on the same street is due largely to the original creation of the bus service as an independent competitive system and partly to the effort made to supply service by buses during the trolley strike several years ago. According to the report there is no necessity in a territory of this extent for the concentration of two classes of transportation upon the same street.

All transportation facilities must be utilized in the most efficient and effective way if the present 5-cent fare within the city limits is to be maintained. This means a co-ordination of both railway and bus service, so as to load them uniformly without overcrowding. The report states that 80 per cent of the passengers using lines entering the downtown district want to be delivered along Broad or Market Street. For that reason the greater part of the service of both cars and buses must be continued along those thoroughfares, the engineers declare. In the outlying residential districts, however, greater convenience to the passengers and more equal loading of vehicles could be obtained by shifting some of the buses to other streets parallel to their present routes. This would divide the districts between existing trolley lines by bus routes traversing sections not directly served at the present time. With schedules properly adjusted this rerouting would tend to relieve overcrowding by a better distribution of the loading between buses and trolleys and bring utilization of both vehicles to a more even balance. Present and recommended routes are shown on an accompanying map.

Full benefit of such rerouting, however, cannot be developed until an equal fare is charged on both bus and trolley lines serving the same territory. On account of the irregular outline of the city a number of lines well located for the convenience of the public traverse portions of Newark and one or more urban communities. The older trolley lines have established fare zones, corresponding generally with the limits of Newark. The newer bus lines, on account of their original competitive operation, have a single fare, against a doube fare on the trolley, although both are now operated by the same company. Equalization of these fares is considered by the engineers to be of prime importance.

The question of adequate service must be considered in relation to the fare. The report states that it cannot be hoped for a 5-cent fare to give a seat to every passenger on zones of such length as occur in this system. During rush hours a reasonable number of standees must be carried. Moreover, if enough buses and trolleys were operated to give a seat per passenger congestion would be so increased that they could not get though the streets at reasonable speed during the rush hours.

Parking Restrictions Recommended

Progressive steps must be taken by the city authorities to eliminate parking at critical points in the interests of the general traffic movement in these localities. Critical points occur opposite the passenger loading platforms of the trolley cars, where the width of the street is less than elsewhere. Parking along the curb opposite these loading platforms is contrary to ordinance. Observation of existing conditions indicates, however, that automobiles are sometimes parked the full length of the curb opposite loading platforms. This restriction should be extended 30 ft. beyond the ends of the platform, and steps should be taken to see that the regulation is observed. Double parking is also contrary to ordinance and should be stopped.

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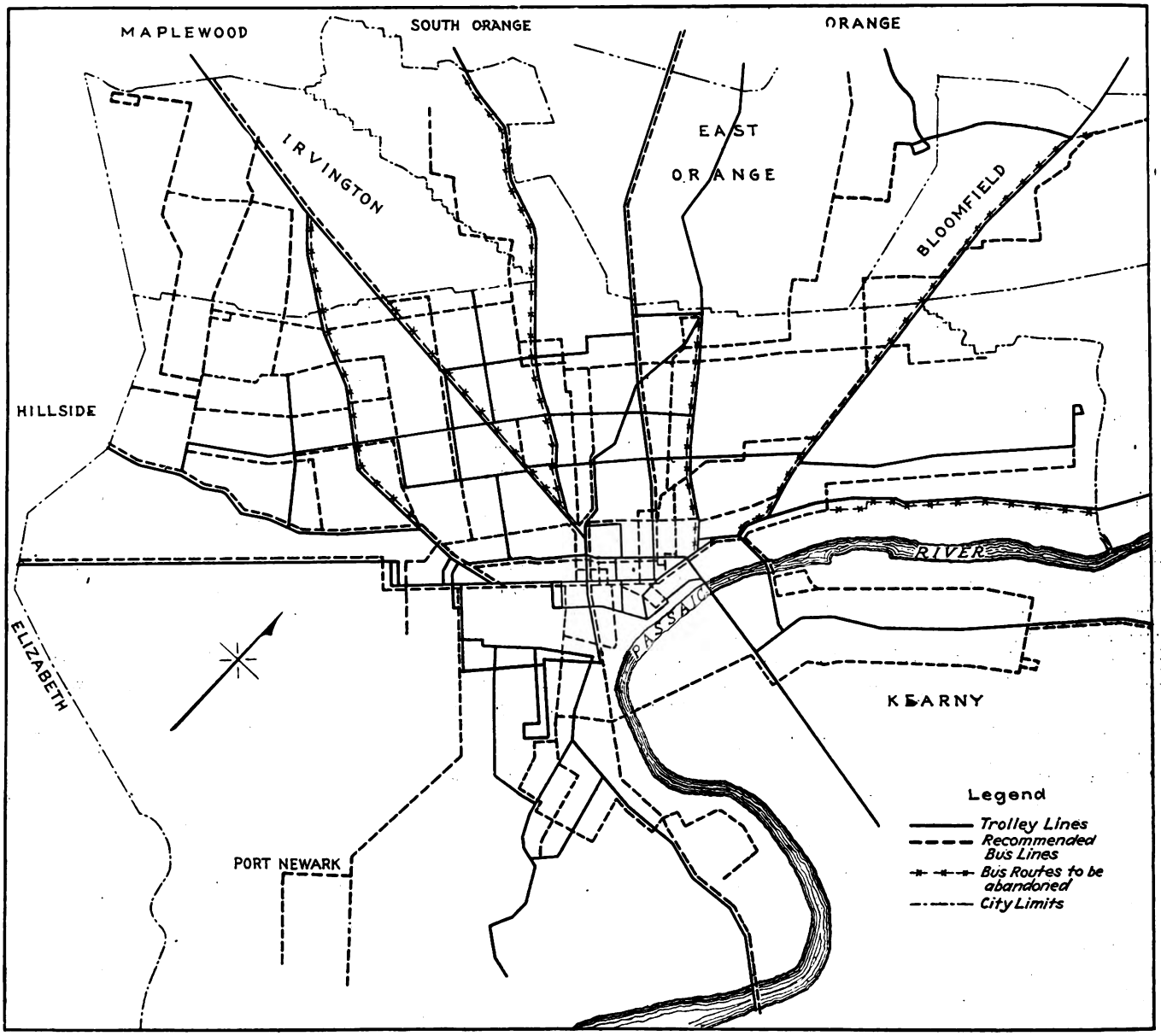

Present car and bus routes in Newark, N. J., and changes as recommended in report made recently by Parsons, Klapp, Brinckerhoff & Douglas. It is proposed to shift the bus routes in the outlying districts to streets on which no cars are operated, thereby eliminating much duplication of service and also accommodating additional territory. No changes are recommended in existing car routes.

A tabulation in the report indicates that 86 per cent of the automobile drivers observe the one-hour parking limit. If the 14 per cent violators had observed the ordinance, the curb line space which actually accommodated 9,679 cars would have accommodated 14,625, an increase of 51 per cent. Better observance of the ordinance, it is said, must come from force of public opinion, as the police cannot at any reasonable expense keep track of every car at all hours of the day.

Traffic conditions on Broad and Market Streets have been the subject of special study. Broad Street from Lincoln Park to Washington Park and Market Street from the Court House to the Pennsylvania Station constitute the two heaviest traffic streets in Newark and their intersection is the heart of the shopping, financial and business district. The vehicular traffic over this intersection is equal to and on some days exceeds that at Fifth Avenue and 42d Street, New York City. It is stated that a twelve-hour traffic check at this intersection between 8 a.m. and 8 p.m. on July 23, 1926, showed 30,828 vehicles crossing, comprising street cars, buses, automobiles, taxicabs and trucks, carrying more than 205,000 persons. The vehicles were divided as follows: Street cars, 2,623; buses, 4,412; automobiles, 17,015; taxicabs, 1,565, and trucks, 4,713.

Any obstruction of these streets which cuts off a lane of traffic necessarily delays all of the passengers in some degree, the report states. During rush hours parking probably causes at least five minutes delay to each passenger. This means a loss of more than 12,000 man-hours every weekday on these two streets. A check of the speed of cars and buses on Market Street from the Court House to the Pennsylvania Railroad Station, Dec. 20, 1926, compared with a similar check during the evening rush hour made Jan. 27, this year, when parking was prohibited, showed a time saving over this route of 2.34 minutes on the trolleys and 2.14 minutes on the buses, due to the increased freedom of vehicular movements on the later date. A substantial increase in speed was shown also by the buses on Broad Street. All automobile traffic on both streets was greatly accelerated.

A comprehensive view of Newark's transit situation,

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the report states, must recognize that before many years a subway either for rapid transit trains or for preliminary use by street cars will be required under Broad Street, at least from Clinton Avenue to Washington Park. Rapid and convenient transportation free from surface traffic interferences will be required to develop Newark's business districts between the above-mentioned parks. Such a section of subway if used at first for trolley cars will ultimately serve as a rapid transit route.

Purchase of the bed of the Morris Canal, the report continues, established the obvious east and west rapid transit route. Development of this line between the Pennsylvania Station and Bloomfield Avenue is recommended as an initial step, with possible extension later. This should be designed for use as a trolley subway, although it will ultimately be required for rapid transit trains. The extension of the Hudson & Manhattan tubes to a terminal under Military park is proposed to give a three-point delivery for that service at the Pennsylvania Station, the proposed station at the southerly end of the city, and the terminal under the park. This, the report declares, would relieve rush-hour congestion.

Construction of a terminal under the park is important because it is the only point at which a general transfer station can be established from which any section of Newark can be reached with a single change. Eventually it would become the intersection of the subways in Broad Street and the canal bed. The proposed terminal site, the report points out, is the heaviest loading point in the city at the present time. A suggested arrangement of facilities at this location is shown in an accompanying drawing.

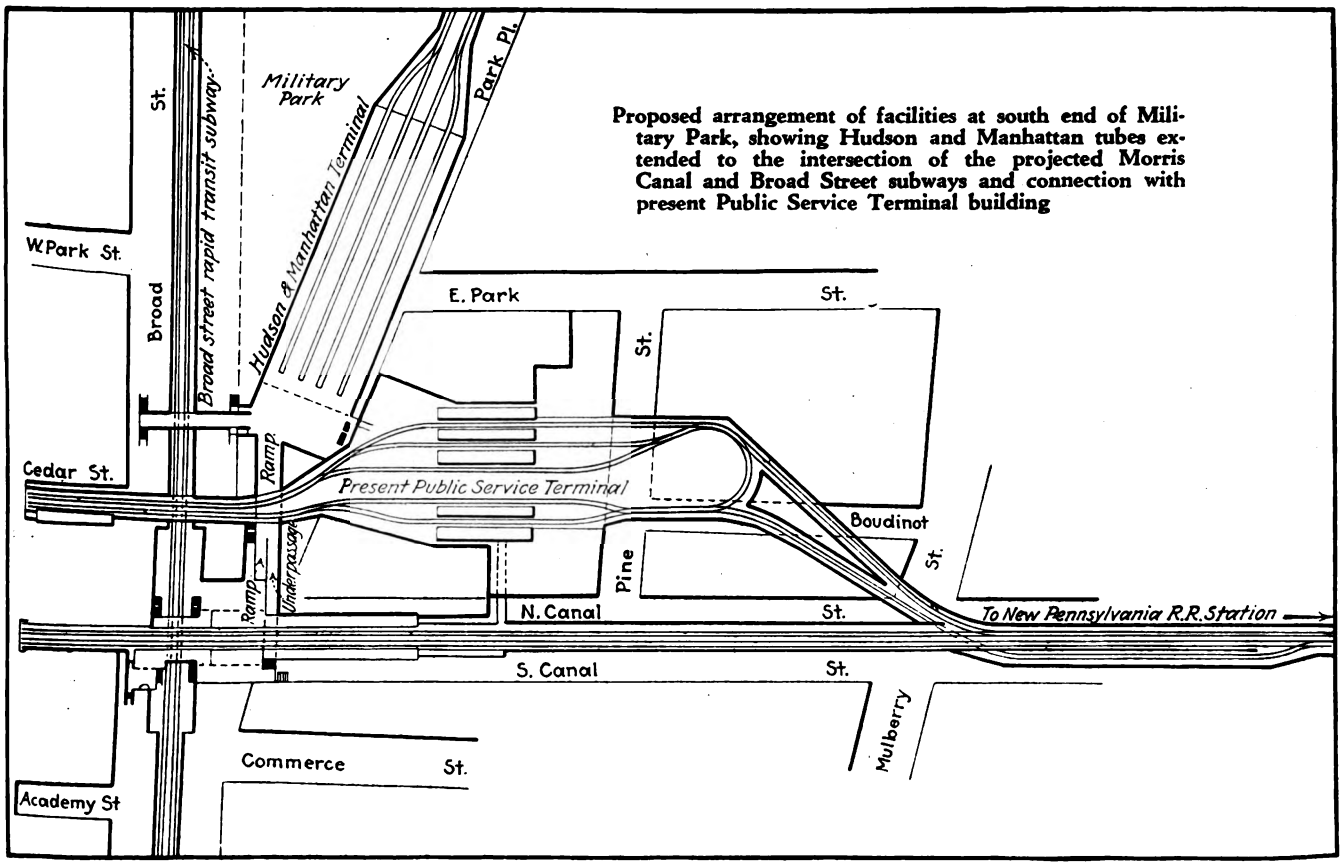
A modern subway built through the central portion of a large city is the most expensive form of construction for a rapid transit line. In certain districts, however, where street congestion and pedestrian traffic have grown beyond the capacity of the surface thoroughfare, a recourse to subways, however expensive, becomes necessary. The great cost per mile of such structures can be justified only by great density of traffic providing a revenue to support them unless the city finds it necessary to construct subways to provide convenient access to its congested districts because of the insufficient street capacity. The report points out that expenditures for a subway system must be justified as self-supporting or must produce a return to the city by increase in property values and consequent larger tax revenue. A study of the city boundaries of Newark shows that its width east and west is not great, and to tap many of the outlying districts would require extension into the territory of other municipalities. As they would participate in the benefits from rapid transit development, they should also participate in the financial burden.

Rapid Track Reconstruction in St. Louis

Widening of Olive Street necessitated the relocation of 3.35 miles of double track without interruption to service

By C. L. Hawkins
Engineer of Way and Structures
United Railways of St. Louis

During the past winter the city of St. Louis took possession of property condemned for the widening of Olive Street, one of the most important arteries leading into the business district, and workmen recently completed the removal of buildings from the area condemned. Double tracks of the United Railways are located on this street and the improvement necessitated extensive changes in the location of these tracks.



Proposed arrangement of facilities at south end of Military Park, showing Hudson and Manhattan tubes extended to the intersection of the projected Morris Canal and Broad Street subways and connection with present Public Service Terminal building

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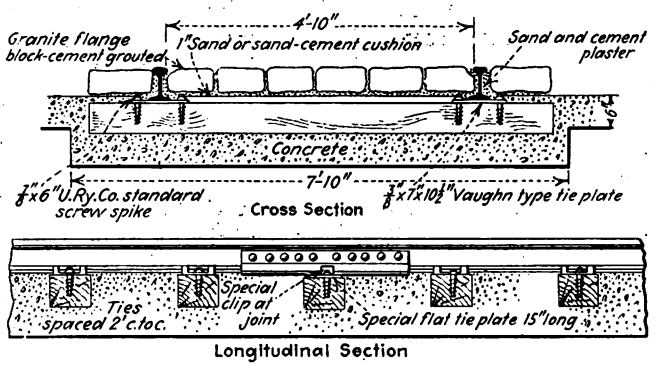
Formerly the width of the street between property lines was 60 ft. with a 36-ft. roadway and 12-ft. sidewalks. The new width of the street is 100 ft. between property lines with a 76-ft. roadway and sidewalks of the same width as before. A total length of 3.35 miles of double track was relocated at a cost of $276,250.

The tracks were of 9-in. Lorain section No. 440 rail, weighing 132 lb. per yard, laid in 1915 on 7-ft. cypress ties in solid concrete foundation laid in 1906. The rails were laid on ½-in. x 6-in. x 11-in. flat tie plates with malleable iron clips and 1¼-in. x 6-in. screw spikes, ⅞-in. round tie rods and 16-rivet Nichols composite joints. These rails carried approximately 4,000,000 cars prior to their removal, while the foundation carried approximately 6,225,000 cars. It is estimated that the rails, if

Widening of Olive Street, St. Louis, necessitated the relocation of 3.35 miles of double track of the United Railway



Granite blocks, Vaughn tie plates, screw spikes and Nichols 10-rivet joints are features of the new track laid on Olive Street, St. Louis

left undisturbed, would have been good for eight years more. After removal they will be used for minor repair work on other tracks.

New tracks were laid on a center line 20 ft. south of the old center line. This left 5 ft. between the gage line of the north rail of the new westbound track and the gage line of the south rail of the old eastbound track and permitted the construction of the new double track without disturbing the old. Rails are 100-lb. A.R.A. series "A" tee section, laid on adzed and drilled 6-in. x 8-in. x 7-ft. 4-in. white oak ties. Vaughn tie plates are used with four lugs bent down over the rail base. Spikes are ⅞-in. x 6-in. screw type. There are no tie rods. Joints are Nichols composite 10-rivet type. A solid concrete foundation is used with the concrete brought up to the top of the ties. The tracks are paved with granite blocks, flange blocks being used along the rail. The area which the railway is obligated to pave is 12 in. wide and the blocks are 12 in. long, laid at right angles to the rail.

Excavation for the southernmost or eastbound track was made with an electrically operated Thew shovel, which loaded the dirt into 5-ton Pierce-Arrow dump trucks standing on the pavement between the old eastbound track and the old south curb of the street. The contractor furnishing the dump trucks kept nine of them in service during a large part of the job and was paid for his services on the basis of yardage handled. The trench behind the shovel was finished by hand. All work on the new eastbound track was done without interference to traffic on the old double track and with little disturbance to the use of the old roadway.

Concrete in the eastbound track was allowed to set for approximately two weeks before work was started on the construction of the new westbound track. After that eastbound cars were operated over the new track and the Thew shovel began excavating a trench for the new westbound track, loading the dirt directly onto cars standing on the old eastbound track. In other respects the method of procedure was the same as for the track first built.

Work Done in the Two Nine-Hour Shifts

Two shifts of nine hours each were used on this work, the first starting at 5 a.m. and quitting at 2:30 p.m., while the second began at that hour and stopped at midnight. Work was begun on the eastbound track on June 8 and was completed, including pavement, on July 1. This work included some grading and some special work required for construction of the westbound track. Work on the latter began on July 18 and was completed, including paving on Aug. 4, making a total of 42 days for the construction of 3.35 miles of double track, or 12½ days per mile of track, including paving.

The new westbound track is located just north of the curb of the old 36-ft. roadway of Olive Street. The new eastbound track is located within the old sidewalk space on the south side of the street. While practically all of the buildings in this area were business houses, only 30 ft. of the new eastbound track is located over old cellars under the former sidewalk. In the 40-ft. strip on the south side of the street the city has kept inspectors on the scene during the wrecking of buildings to see that only clean material, free from wood, building paper and other trash was used for filling in the cellars. No clay was permitted to be used in the filling process. By this careful inspection it is hoped that a foundation has been secured that will not settle materially.

Contracts for paving the roadway outside of the railway area was let by the city on July 26. Work started soon thereafter and it is hoped that the south roadway and south sidewalk will be finished before cold weather interferes. During the construction of the south half of the street westbound cars will be operated over the old westbound track and eastbound cars will be operated over the new westbound track. This will leave the new eastbound track as a landing space for passengers and make unnecessary the construction of temporary loading platforms. The old westbound track will be out of service because portions of it must be removed to permit the installation of manholes for telephone conduits centered under the new westbound track. All conduit manholes are so built that the entrances are far enough away from the tracks to permit pulling in or out of cables without interference with the operation of cars.

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The Prince of Wales and Vice-President Dawes transferring from their automobile to the Ondiara for the Niagara Gorge trip

Royalty Visits Niagara Gorge

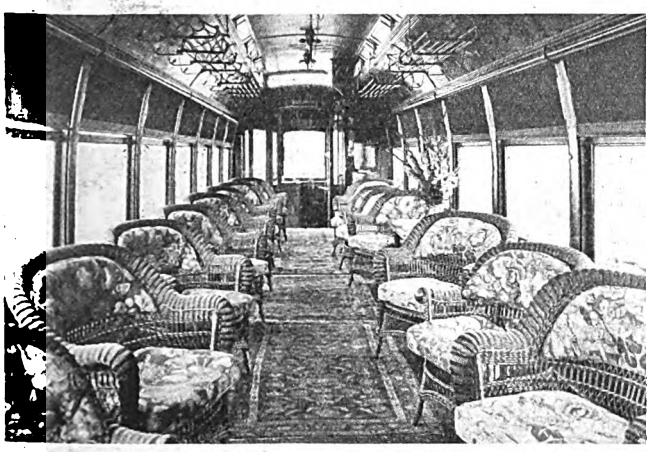
International Railway was host to the Prince of Wales, Vice-President Dawes and others. The trip was safeguarded well by the company

WHEN his Royal Highness, the Prince of Wales, his brother, Prince George, Prime Minister Stanley Baldwin of Great Britain, Secretary of State Kellogg, Vice-President Dawes and other officials representatives of England and the United States attended the dedication of the new $4,500,000 Peace Bridge across the Niagara River from Buffalo to Fort Erie, Ont., the International Railway, Buffalo, N. Y., played the rôle of host to a large part of royalty and American statesmen on a trolley tour through the lower Niagara Gorge.

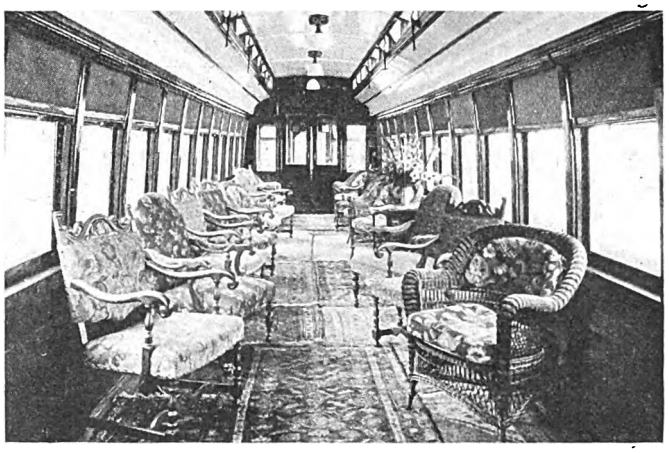
It was the first time that an heir to the British throne and a Vice-President of the United States, together with more than a score of other prominent members of the royal family and distinguished American officials, were guests of an electric traction company. They deserted their private automobiles and the royal train, which carried the British and Canadian party across the Dominion, for seven especially decorated street cars.

For two weeks previous, the International Railway had been planning every detail of the trip which started at Chippawa, Ont., and continued over the Park and River division of the company to Queenston, over the company's lower bridge to Lewiston through the lower Niagara Gorge via the Niagara Gorge Railway, up through the business section of Niagara Falls, N. Y., over the Falls View Bridge of the railway company and back again into Canada.

The photographs show interior views of two of the cars used by the royal party. The cars previously had been put through the paint shops, the seats had been removed and heavy wicker arm chairs and period furniture was installed. Oriental rugs covered the floors and



The Ondiara, private car of the International Railway, carried the Prince of Wales and his party



The Rapids, private car of the Great Gorge Route, also was used to carry the royal visitors

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the cars were decorated with flowers. Arrangements had been made with a caterer to serve tea to the distinguished passengers. The trainmen were especially selected from the viewpoint of experience and appearance. Seven cars were in the procession, the first being a pilot car carrying Bernard J. Yungbluth, president of the International Railway, and other officials. The second car carried the Prince of Wales, Prince George, Prime Minister Baldwin, Secretary Kellogg, Vice-President Dawes and some of the ladies in the party.

All arrangements covering a period of two weeks were handled personally by President Yungbluth. No other traffic was allowed over the various divisions and bridges while the royal party was in transit, and there were no stops for customs or immigration inspection. At the intersection of the International local lines in Niagara Falls and the New York Central Railroad, trains were held up so cars would not be detained at the crossing.

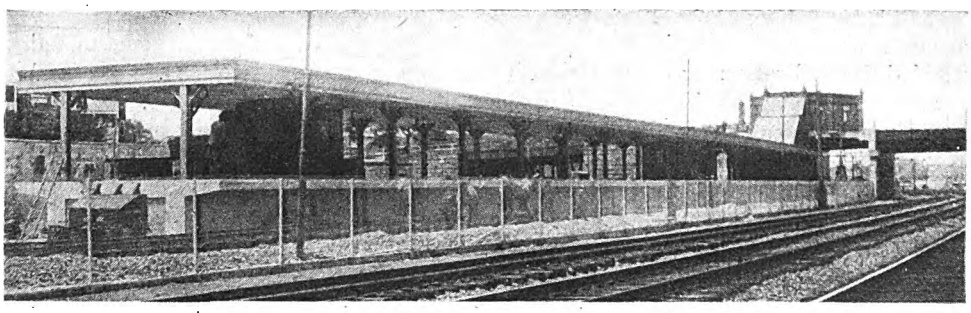
Twenty officials and employees of the company were assigned by President Yungbluth to supervise the trip, indicating the extreme care exercised to insure the safety and comfort of the distinguished party. In addition, other men were assigned to ride the cars in the royal procession and to inspect all men in uniform. The two private cars used were the Ondiara of the International Railway, and the Rapids of the Niagara Gorge Railway. The police supervision was also arranged by the Dominion authorities, the United States Secret Service, the New York State constabulary and the Niagara Falls police, these bodies co-operated with the railway executives and there was a lengthy detailed assignment of these men to prevent any unpleasant incident. One of the photos shows Vice-President Dawes and the Prince of Wales leaving their private automobile at Chippawa to board the International Railway special car.

First Station Completed on Dorchester Rapid Transit

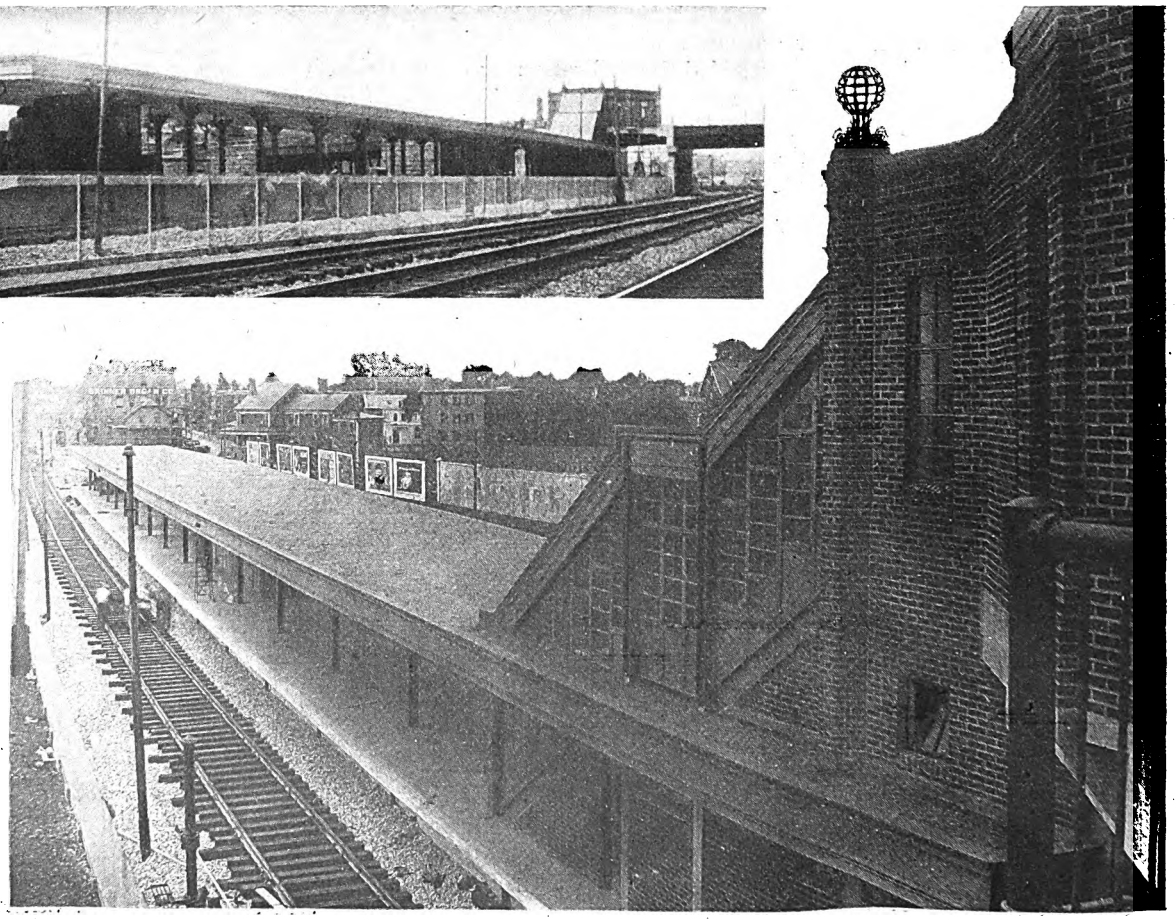
SIMPLICITY is the keynote in the design of the new Columbia station, the first to be completed on the Boston Elevated Railway's new Dorchester rapid transit extension. This station will serve a heavy residential district and several large industrial plants. In general arrangement it is of the "island" type. The headhouse is provided with wide doorways. It has an area of approximately 290 sq.ft. on the sidewalk level for prepayment use. The fare collection apparatus includes two General Electric automatic dime-in-the-slot passimeters and an old type passimeter located at the change booth window.

Two flights of stairs lead from the fare collection barrier to the north end of the platform, which extends 350 ft. beyond the stairs. The width of the platform varies, being 20 ft. wide at the stairs and 23 ft. at the opposite end. A feature of the design is a 4-ft. space between the platform edge and the concrete base, which not only provides a place for cables, wires, piping and other necessary equipment but serves as a refuge for track workmen when a train is approaching. A canopy with slab waterproofed concrete roof is supported by steel members and extends the entire length of the platform. Two switch rooms and toilets for the public and employees are located under the stairways, while a waiting room and station master's room are in the center of the station.

The entire structure is fireproof, being built of brick, concrete and steel. The tracks were so located as to provide for a 135-ft. extension to the platform to be built when increased traffic warrants six-car trains.



Above, Columbia station from Old Colony Railroad. Columbia Road viaduct and headhouse are on the right



At right, view of the island type station from the viaduct

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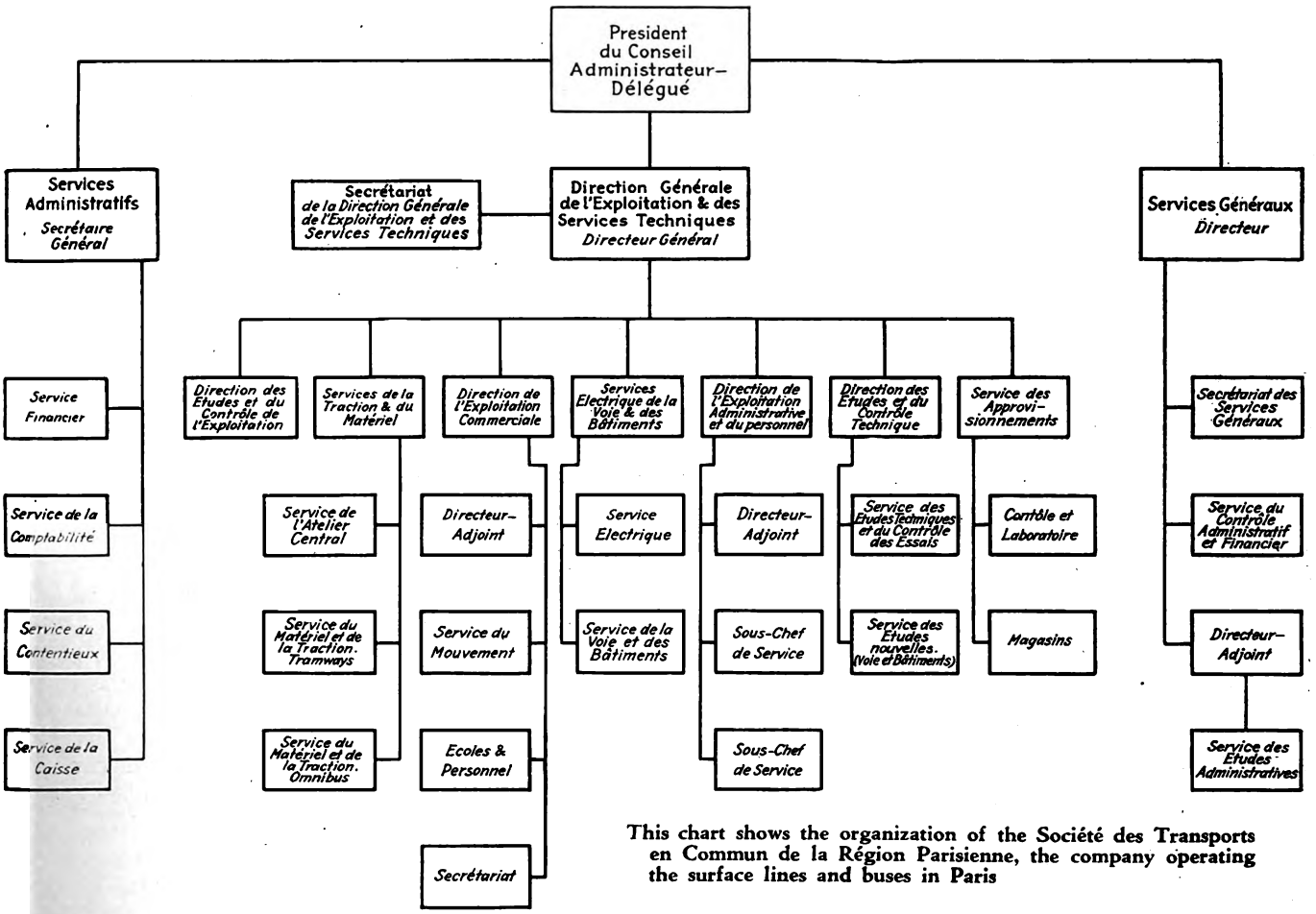
How the

Duties Are Assigned Abroad

European companies have different departments and divisions than railways here. The organization chart of the Paris electric railways and bus system is analyzed



This chart shows the organization of the Société des Transports en Commun de la Région Parisienne, the company operating the surface lines and buses in Paris

ORGANIZATION of the European tramway companies differs widely from that of electric railway companies in the United States. There are more departments, and the responsibilities of the different department heads show quite a variation from American practice. To illustrate this an outstanding European company, the Société des Transports en Commun de la Région Parisienne, which operates all of the tramways and bus lines in Paris, has been selected, and an organization chart is published herewith. In this chart the titles of all of the officers and departments are given in French, as there are no exact equivalents in English for some of the titles.

This company is one of the largest in Europe, and during the ten months ended Oct. 31, 1926, it carried 858,813,055 passengers and had gross receipts of 441,416,709 francs ($17,656,668). Besides its buses and street cars, it operates a short suburban steam road and a line of boats on the River Seine.

The chief executive officer of the company is called Président du Conseil, Administrateur Délégué, corresponding to our president.

The three department heads reporting to him are the secretary general, in charge of the department of Services Administratifs; the general manager, in charge of the department of Exploitation et Services Techniques, and the manager of the department of Services Généraux.

The department of "Services Administratifs," presided over by the secretary general, is much greater in scope than that under the same officer in this country. Broadly speaking, it looks out for the corporate life and activities of the company, except that directly connected with the movement of passengers and the legal activities. Besides being responsible for the corporate records and the

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preparation of the various financial reports of this company, the secretary general is the ranking financial officer of the company. This means he is in charge of all receipts from the time they are turned in at the various depots by the representatives of the transportation department. He also has charge of all purchases of material and all disbursements, such as payments for wages, pensions and insurance, and even the issue of tickets to the depots. He also attends to the sale of any property of the company and has charge of all litigation relating to claims. The officers of the company corresponding to the treasurer, stock registrar and claim agent report to him. The titles of the four subdivisions of the department of "Services Administratifs" may be translated as finances, accounts, claims and treasury.

Transportation and Engineering Department

All operating questions come under the Directeur Général, or general manager, the title of whose department might be translated as Transportation and Engineering. This department has seven subdivisions, as shown in the chart. The secretary of this department acts as liaison officer to these several subdivisions as well as attending to the duties naturally pertaining to his work. The duties of these subdivisions will be considered as they appear on the chart.

The first subdivision on the chart is Direction des Etudes et du Contrôle de l'Exploitation, which might be considered the same as our schedule department, except that there have been added to it some of the duties of a commercial research department, such as the determination of new routes, compilation of bonuses for motormen and energy-saving campaigns, and of statistics on operation.

The next subdivision, "Services de la Traction et du Matériel" corresponds to our equipment department. This department is shown in the chart to have three divisions which correspond to our (1) main repair shop (2) maintenance of cars, and (3) maintenance of buses. There are also two other departments not listed, i.e., "boats" and "steam railroad," because of the operation of these two services by the Paris company, as explained.

The next subdivision listed is that of "Exploitation Commerciale," which may be termed the transportation department, and its three divisions might be called vehicle movement, instruction and personnel, and secretarial. The first of these has charge of the movement of cars and buses in regular and extra trips, the issue of all tickets to employees and the supervision of carhouses and garages as far as relates to car movement. The second division is responsible for the training of motormen and conductors, the issue of the employees' rule book, application of discipline, safety work, study of the causes of accidents, and the issue of merchandising literature, such as posters and guides. The secretarial department has charge of the employee files and the lost and found departments, and acts as liaison officer for the other group departments.

The next subdivision might be known as the electrical and way engineering department. One of its divisions has charge of the electrical distribution, high tension and low tension, and substations. The other has charge of track and buildings, including cleaning of track and conduit and the greasing of switches and curves.

The next sub-department listed is that of "Exploitation, Administrative et du Personnel." This means a combination of the duties of an American employment department and welfare department. This department attends to the hiring of the transportation employees, the maintenance of the files of employees who have retired from the service, supervision of the benevolent funds and pensions, and the employees' medical service.

The next subdivision listed is that of "Etudes et du Contrôle Technique" and might be considered as the technical research or statistical department. Its work differs from that of the operating research department already mentioned because its attention is devoted purely to studies for the improvement of the equipment, including track and buildings. It has two subdivisions, one to cover existing equipment, the other, new work, including track.

The final subdivision of the operating department is that of "Approvisionnements," which corresponds to the stores department on an electric railway, except that it also has charge of the printed unissued tickets as well as of all fuel supplies. It also passes on all requisitions for purchases of material and orders for sales, conducts all laboratory tests required on material purchased or under consideration, and performs some other duties which are not usually undertaken by the stores department of an American electric railway.

Department of General Services

The final main department is that of "Services Généraux" or general services. This is essentially the legal department, though not including accident litigation. It has supervision of the franchise matters of the company and cares for all legal questions in relation to the franchise which may arise with the municipal authorities. It also has charge of the publicity of the company except that of merchandising literature, but including the relations of the company with the press. All of these duties are performed by the first sub-department, listed in the chart, "Secrétariat," or by the third, "Services des Etudes Administratives."

The second sub-department, or "Service du Contrôle Administratif et Financier," is essentially an auditing department, not only of accounts and inventories, but of all official orders and instructions issued so far as to see that they do not exceed the powers of the company or conflict with existing city ordinances. Where any such orders require the visé of some municipal officer, this department conducts the negotiations to obtain such approval.

Blotters Advertise Levis

These blotters effectively call attention to the beauties of Quebec's South Shore, which is served by the Levis Tramways

QUEBEC'S South Shore and its attractions are being advertised by the Levis Tramways through the distribution of blotters lithographed in color. Attention is called to the superb spots for summer residence and good beaches for bathing and canoeing only a short distance from Quebec that may be reached by tramway or by auto.

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Quality Trainmen

Obtained for the Transportation Department

Los Angeles finds careful selection of trainmen greatly reduces labor turnover. About 50 new men only now required to keep force to standard size. Full particulars given of methods employed

METHODS of selecting, employing and training platform men for service on the Los Angeles Railway follow well-established lines. Careful attention, however, is paid to obtain courteous, safe operators who will create public good will. Because of favorable climatic conditions in southern California this company has large numbers of applicants for positions as motormen and conductors from which to make selections. Professional men, operators of experience and other classes of men from all over the country seek positions as platform men in Los Angeles. This abundance of applicants from which to choose has raised the standard of employment and improved the service.

Selecting the proper men centers around a few simple mental tests. No attempt is made to put a man through an extended psychological examination. His ability to react favorably to the Haggerty test, which is a modification of the army examination, is sufficient to qualify him to fill out an application blank. Failure, of course. eliminates the applicant.

The superintendent of employment gives each man a general interview outlining the work and policy of the company, after which an acceptable candidate fills out an introductory blank and is then subjected to the mental test. Tests are given Monday, Wednesday and Friday. Classes of from 20 to 25 applicants are handled, depending on the need for men at the various divisions. Results of the psychology test are recorded and forwarded through the employment department and further examination of the applicant rests upon the grade made.

The successful candidate proceeds to the employment desk, where he is given an arithmetic test which embodies simple problems of addition, subtraction and calculation. This has had its effect in weeding out applicants who are not mentally fit to make out the trip sheets and other forms of the company requiring simple calculating and arithmetic.

More Than 90 Per Cent of Trip Sheets Correct

Both systems of tests are employed at the present time, the company not having decided which type will be adopted as final. However, since the installation of the calculation test, combined with the effect of the merit and bonus system, an improvement has been noticed in the calculations made on the trip sheets Before the tests were in effect, and prior to the merit and bonus system, fully 60 per cent of the trip sheets were calculated inaccurately. Now more than 90 per cent are correct, as checked by the auditing department. In the calculation test a man is allowed twenty minutes to do the problems. Usually he takes less time than this. His grade in this test is recorded as a percentage, with the notation of the number of minutes he required to complete the work.

With the calculation test passed, the man desiring employment is permitted to fill out the application blank. On this form, shown in an accompanying illustration, the applicant must answer all questions to the best of his knowledge. On the third page of the form is an agreement between the Los Angeles Railway Corporation and the employee. A clause in this agreement says that a $1 deposit is required of each applicant for payment into the fund of the Co-operative Association of Los Angeles Railway Employees. This fund is for the purpose of covering the responsibility of all equipment furnished by the company to its employees, for uniforms purchased on installments and partially to indemnify the company against losses from wrongful acts of employees.

After the application blank has been filled out and checked by the clerk in charge, to see that all questions have been answered, a receipt for it is given to the applicant.

A man must be 23 years of age to qualify as conductor and 25 years of age for motorman, and he must be under 40 years of age. An exception is made to this latter qualification in the case of re-employment of men with particular qualities which make them especially desirable employees.

Applications of approximately 100 motormen and 100 conductors are kept on hand. Calls are made on these in the order of their application. The experience of the company in calling applicants for service has been that out of the 100 applications on file about 60 men are available for immediate service.

During the past four years the number of new men employed each year has been steadily decreasing. In 1923 approximately 1,600 men were engaged for employment in the train service. In 1925 this number had been reduced to about 800, and at present the employment department is handling only about 50 men per month.

Every Tuesday groups of men, as needed by the operating department, are called into the employment office to report for instruction, and, if satisfactory, for subsequent employment. At this time the men are required to pay an additional $1.85 for their caps. They are sent from the employment office to the auditor's office to

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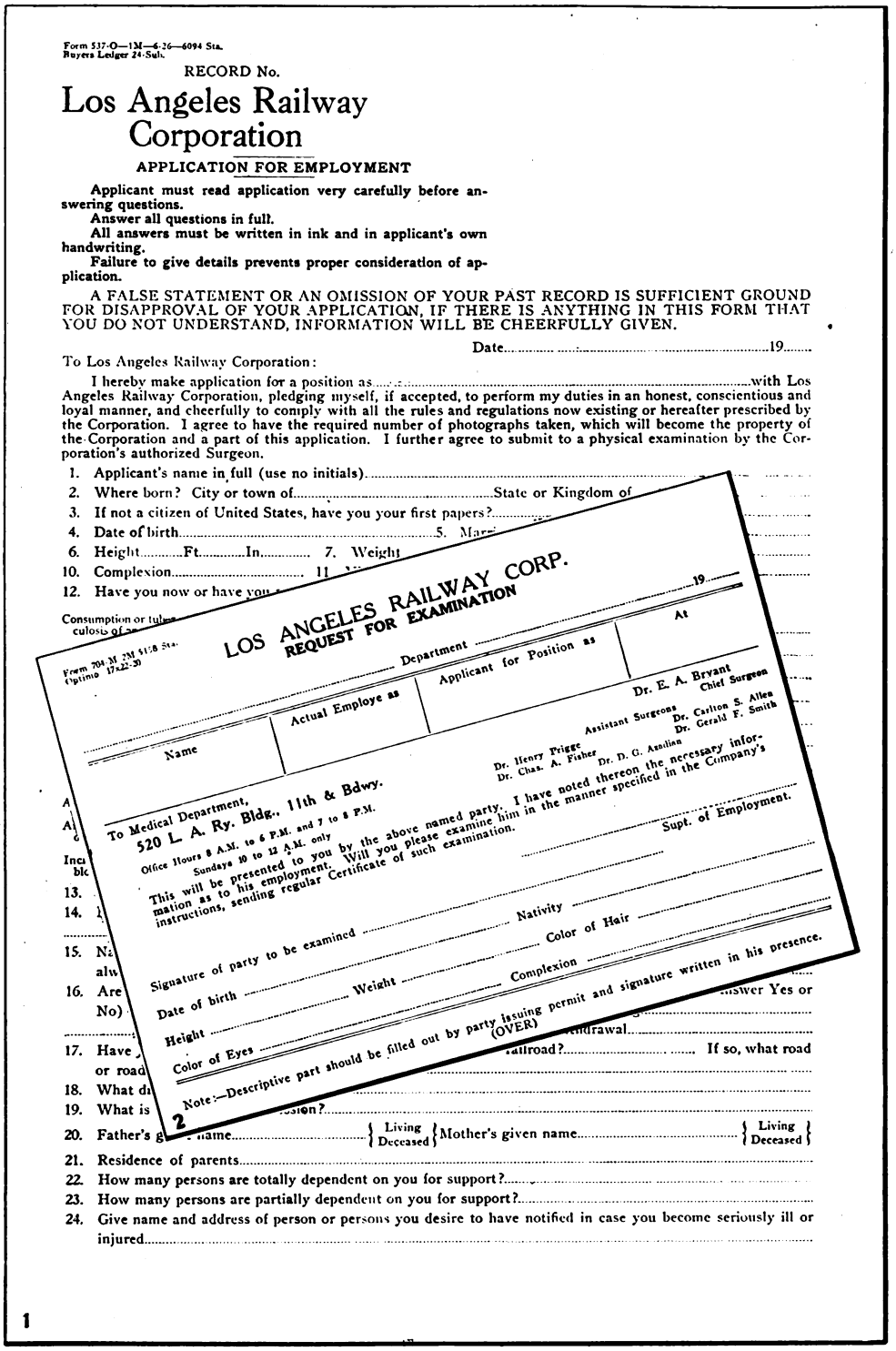

Form 537-O—1M—6-26—6094 Sta.
Buyers Ledger 24-Sub.

RECORD No.

Los Angeles Railway Corporation

APPLICATION FOR EMPLOYMENT

Applicant must read application very carefully before answering questions.
Answer all questions in full.
All answers must be written in ink and in applicant's own handwriting.
Failure to give details prevents proper consideration of application.

A FALSE STATEMENT OR AN OMISSION OF YOUR PAST RECORD IS SUFFICIENT GROUND FOR DISAPPROVAL OF YOUR APPLICATION, IF THERE IS ANYTHING IN THIS FORM THAT YOU DO NOT UNDERSTAND, INFORMATION WILL BE CHEERFULLY GIVEN.

Date.....19.....

To Los Angeles Railway Corporation:

I hereby make application for a position as.....with Los Angeles Railway Corporation, pledging myself, if accepted, to perform my duties in an honest, conscientious and loyal manner, and cheerfully to comply with all the rules and regulations now existing or hereafter prescribed by the Corporation. I agree to have the required number of photographs taken, which will become the property of the Corporation and a part of this application. I further agree to submit to a physical examination by the Corporation's authorized Surgeon.

1. Applicant's name in full (use no initials).....
2. Where born? City or town of.....State or Kingdom of
3. If not a citizen of United States, have you your first papers?.....
4. Date of birth.....5. Mar...
6. Height.....Ft.....In..... 7. Weight
10. Complexion..... 11 ...
12. Have you now or have you ...

Consumption or tub... culosis of ...

LOS ANGELES RAILWAY CORP.
REQUEST FOR EXAMINATION

Form 704-M 2M 5158 Sta.
Optimo 17x22-30

.....19.....

Name	Actual Employe as	Applicant for Position as	At

Dr. E. A. Bryant, Chief Surgeon
Assistant Surgeons: Dr. Henry Prigge, Dr. Chas. A. Fisher, Dr. D. G. Asadian, Dr. Carlton S. Allen, Dr. Gerald F. Smith

To Medical Department,
520 L. A. Ry. Bldg., 11th & Bdwy.
Office Hours 8 A.M. to 6 P.M. and 7 to 8 P.M.
Sundays 10 to 12 A.M. only

This will be presented to you by the above named party. I have noted thereon the necessary information as to his employment. Will you please examine him in the manner specified in the Company's instructions, sending regular Certificate of such examination.

Supt. of Employment.

Signature of party to be examined ..... Nativity .....
Date of birth ..... Weight ..... Color of Hair .....
Height ..... Complexion .....
Color of Eyes .....

Note:—Descriptive part should be filled out by party issuing permit and signature written in his presence.

(OVER)

2

13. ...
14. ...
15. N... alw...
16. Are ... No) ... ...swer Yes or
17. Have ... ...ndrawal..... or road ... ...ailroad?..... If so, what road
18. What di...
19. What is ... ...sion?.....
20. Father's g... name..... { Living / Deceased } Mother's given name..... { Living / Deceased }
21. Residence of parents.....
22. How many persons are totally dependent on you for support?.....
23. How many persons are partially dependent on you for support?.....
24. Give name and address of person or persons you desire to have notified in case you become seriously ill or injured.....

1

No. 1. The application blank, which is a four-page folio, requests detailed information. The third page contains a working agreement between the corporation and the employees
No. 2. The medical department fills out this form at time of examination

make this deposit and from the auditor's office to the tailor shop, where the cap is issued. A medical examination is given at the time the application is made, so that there will be no delay in placing the man in the school of instruction if he is satisfactory in other ways. Also, at the time of medical examination, the applicant is told about the medical service which is given on a co-operative plan by the company. Trainmen who pay a fee of 50 cents per month are entitled to medical attention, advice and treatment. The company pays an additional 50 cents per month for each man in order to maintain this service.

The order in which the applicants return from the auditor after depositing the money for their caps determines their seniority for the term of employment with the company. After all have reported back to the employment office they are given their first course of instruction.

Instruction by Class and Road Work

Classes for instruction are held two days a week at twelve noon. The superintendent of instruction outlines the prospective work for the men, stressing the disagreeable features as much as possible. After his preliminary lecture and at several times during the course of instruction he gives those who do not care to go on with the work an opportunity to leave. About 12 per cent of the men leave for one of four causes: Resignation, falsifying of application, general slowness and insubordination.

At the preliminary instruction the men are told that if they qualify and are employed they will receive $2 a day for the instruction period. After that they will receive the regular wage scale with a guarantee. The course of instruction varies with the man. For some it requires only two days; with others fourteen, being shorter for conductors than for motormen. After the first day of class instruction the men are divided into groups, the student conductors being taken by the conductor instructor and informed of their duties.

The motorman instructor takes the class of student motormen to the instruction car, where the main instruction is given. Two cars are used for this work. Both are of a rather old type, but one which naturally would be used by a new trainman on a tripper run. Four days are spent by the class of motormen on the instruction cars. The first day is spent with the car in the yard. On the second day the motorman instructor runs the car out of the yard and over one of the lines of the division, showing the new men the operation of the controller and air brake and calling their attention to conditions along the line.

In the yard work the student is taught to keep his head up while at the controller. Each man is given a chance, the instructor permitting him to try to master

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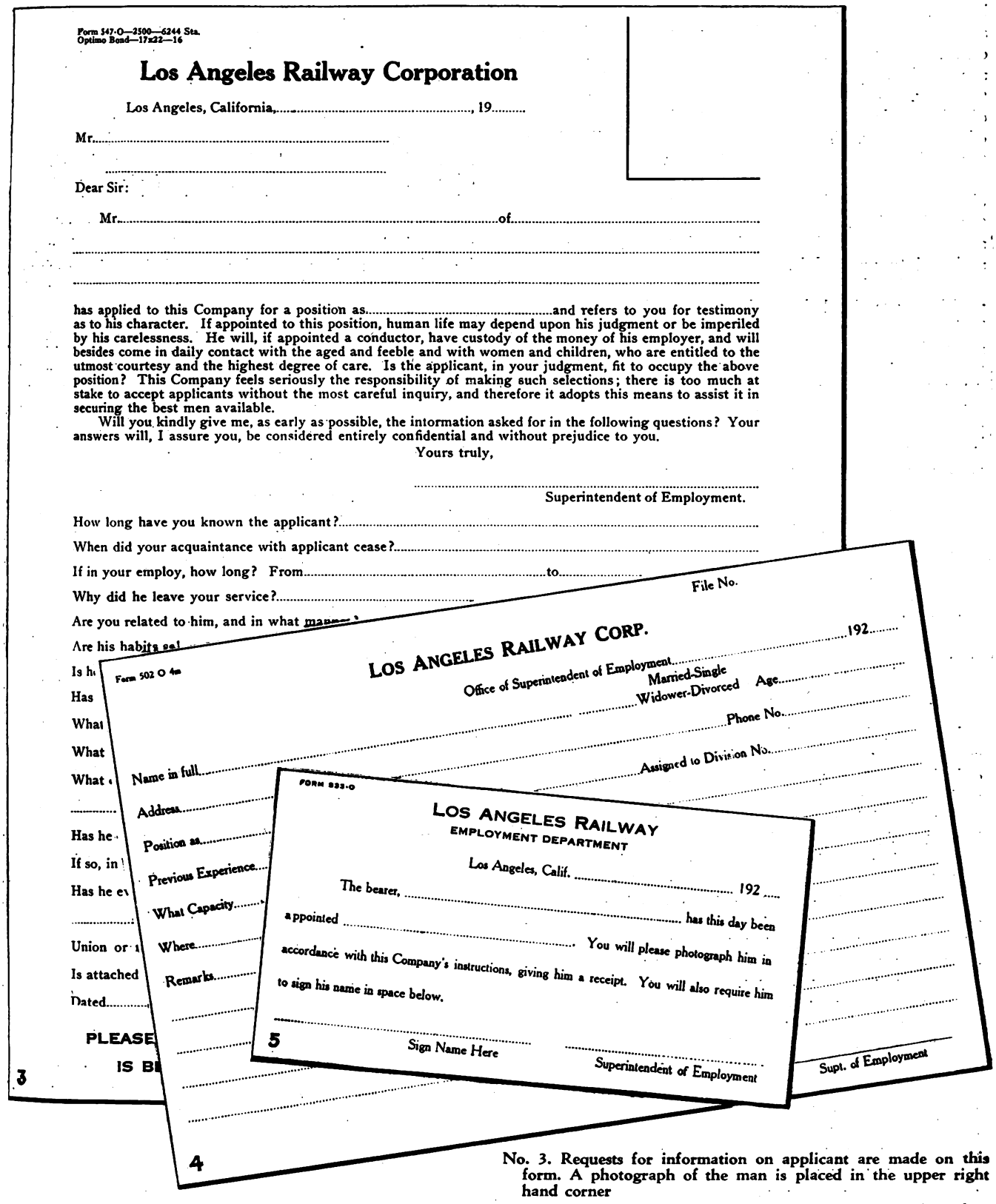

Form 547-O—2500—6244 Sta.
Optimo Bond—17x22—16

Los Angeles Railway Corporation

Los Angeles, California,....., 19.....

Mr.....

.....

Dear Sir:

Mr.....of.....

.....

.....

has applied to this Company for a position as.....and refers to you for testimony as to his character. If appointed to this position, human life may depend upon his judgment or be imperiled by his carelessness. He will, if appointed a conductor, have custody of the money of his employer, and will besides come in daily contact with the aged and feeble and with women and children, who are entitled to the utmost courtesy and the highest degree of care. Is the applicant, in your judgment, fit to occupy the above position? This Company feels seriously the responsibility of making such selections; there is too much at stake to accept applicants without the most careful inquiry, and therefore it adopts this means to assist it in securing the best men available.

Will you kindly give me, as early as possible, the information asked for in the following questions? Your answers will, I assure you, be considered entirely confidential and without prejudice to you.

Yours truly,

.....

Superintendent of Employment.

How long have you known the applicant?.....

When did your acquaintance with applicant cease?.....

If in your employ, how long? From.....to.....

Why did he leave your service?.....

Are you related to him, and in what manner?

Are his habits sol

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Has he

If so, in

Has he ev

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Union or

Is attached

Dated.....

PLEASE

IS BE

3

Form 502 O 4m

LOS ANGELES RAILWAY CORP.

File No.

Office of Superintendent of Employment.....192.....

Married-Single
Widower-Divorced Age.....

Phone No.....

Assigned to Division No.....

Name in full.....

Address.....

Position as.....

Previous Experience.....

What Capacity.....

Where.....

Remarks.....

.....

.....

houses. They are men picked particularly for their ability, and for this work they are paid $1 per day extra. Runs on which line instructors teach motormen are particularly long and cover the greatest amount of territory. About seven such runs are taken out of each division, this amounting to approximately 20 per cent of the number. The student reports to the line instructor and stays with him until the work is completed, taking a different run each day, so that at the end of eight days the division has been covered by the instructor and student. As there is not enough training to go around, the work is rotated so that all instructors are assigned to part of it.

Vacancies in the operating department supervisory positions are filled from the group of line instructors. This system is designed to anticipate the future approximately five years, when openings will occur in the operating department which of necessity must be filled from the rank and file of the organization. Since this system was begun two years ago seventeen men have been promoted to supervisory positions. At the time a line instructor qualifies for such a position he is asked what particular work in the department appeals to him and what position he would accept. This statement is placed on his qualifying papers and when an opening occurs he is asked if he cares for the position.

Conductors are instructed for about eleven days by an operating conductor instructor. They are taught how to make out trip sheets and the various forms required. This work is supplemented by outside instruction on the car under the supervision of a line instructor similar to that done in the case of the motormen.

On Probation for Three Months

While under the line instructors on the cars both conductors and motormen are subject to additional quizzing by other line instructors. Those who show aptitude are pushed through the course more rapidly. After qualifying with the line instructor, the student is turned in to the division headquarters as ready for work. His name is placed at the foot of the extra list, and from then on he becomes a regular employee of the company. For 90 days from starting the instruction work the new man is on probation. Three months after the probation period is up he comes under the merit and bonus system and is entitled to receive $5 per month bonus for efficient operation.

While on probation the new man is given additional training by traveling instructors, two of whom operate out of each division. These men call attention to infraction of rules or improper handling of equipment.

As a rule they do not report such lack of efficiency to the operating department, but make the correction on the spot and stay with the student until he has overcome the difficulty. However, instructors do make reports of inefficient operation of regular trainmen. These reports have their effect on the trainman's efficiency record, upon which is based the bonus system.

Particular attention is paid to instruction in energy saving. A watt-hour meter is carried on each car, its use is explained to the new man and he is taught how he can best operate the car to reduce the energy consumed.

After 90 days of service the new trainman returns to the instruction department for four hours of lecture work. These groups are made up of practically the same men who formed the student instruction class.

No attempt is made in the course and during the subsequent car work under the line instruction to teach the student the details of equipment and how it operates. The principle has been to give the men one thing to assimilate at a time and gradually to work up to the more complicated details of motor control and train operation. At the South Park shop is located an instruction room fitted with both the K and H-L types of control and a complete layout of air lines. Groups of motormen on probation are given instruction on this apparatus so that they will be familiar with the mechanical operation of their equipment. It is not the intention to make mechanics out of them, but each man must be able to make minor adjustments on the road in order to cut delays to a minimum.

Instruction Is Continued to Trainmen

After a man is definitely started in the regular train service his instruction does not stop. Meetings are held every other month, at which a representative of the supervisory force, the superintendent of operation, his assistant, or some other company executive, addresses the men at the various divisions on the matter of safety, courtesy and efficient service.

Three talks are given on each particular day to each division. This permits the attendance of men who work at various hours. On alternate months questionnaires are sent to the men, with the request to return the answers to the division superintendent within a specified time limit. All of these questions relate to operating problems and the answers should be known to each trainman. At the lecture these questions are gone over in a general way and additional information given to the men on any point which, through their answers to the questionnaires, they have indicated lack of knowledge.

Gray Line Shows Missourians

WHILE Kansas City keeps growing in numbers and in industries, opportunity is not lacking to interested residents and inquiring visitors for acquaintance with that section of the country bounded by the fertile valleys of Missouri and the wheat fields of Kansas. Seeing Kansas City via the Gray Line is an education no less inspiring than instructive. So thorough has been the survey for sightseeing possibilities that now no fewer than seven tours are being conducted by the Gray Line, operated by the Kansas City Public Service Company in Greater Kansas City. Considering this is the initial attempt of the company into the sightseeing business, the tours are doing remarkably well. Many interesting trips can be made by street car or motor coach, the routes of which traverse every section of both Kansas City, Mo., and Kansas City, Kan., extending as far east as Independence, Mo. The Montgomery Ward and Sears-Roebuck plants, the famous Country Club residential section, well-known boulevards and parks and the industrial districts are all reached by one or more of the tours.

These places of interest are described very alluringly in a twelve-page illustrated pamphlet containing map and all necessary details as to price, time consumed on each trip, length of tour and historic points of interest covered en route. In addition suggestions are made to prospective picnic parties for the chartering of coaches, to parties desiring to spend a day on the golf course and to travelers seeking a sightseeing itinerary in other cities.

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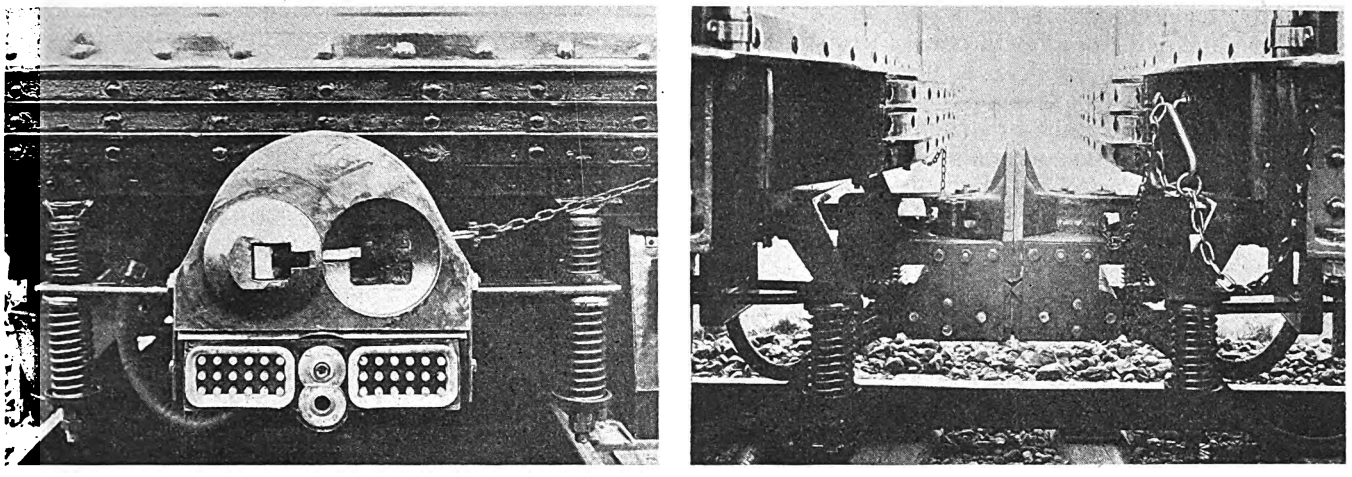
Hamburg Elevated Develops Automatic Combination Coupler



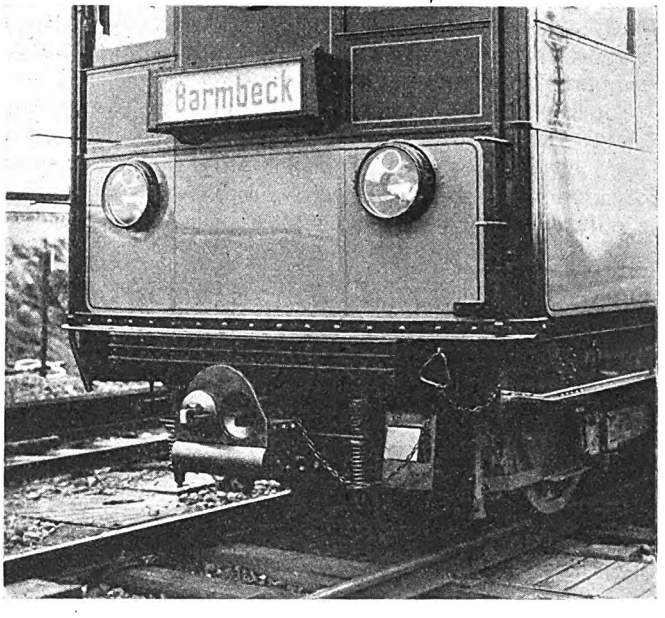
At left, front view of coupling; at right, side view of coupling

COMBINATION of the functions of a car coupler and methods of connecting the air pipes and electrical conductors has been accomplished in an automatic coupler by the Hamburg Elevated Railway, Hamburg, Germany. A number of the cars have been equipped with this coupler, and its use is being extended to the rest of the equipment. The car coupler is above and the electrical and air couplers below, and the latter are protected by a cover which automatically swings upward and back when the coupling takes place. The operation of the car coupler is well shown in the five line engravings.

Fig. 1 is a plan view of adjoining couplers on two cars about to be coupled. In each end there is a link attached within the housing to one side of a sort of triangular plate, pivoted in the center and held by a spring in the position shown. On the side of this plate opposite to the link is a notch over which the link on the other coupler slips.

Fig. 2 shows the action of these plates as the cars come together, the triangular plates turning, so that each link slips into its proper notch. When the faces of the couplers are together the springs draw the plates to the position shown in Fig. 3.

Uncoupling is accomplished by a chain which, when pulled, throws the plates into the position shown in Fig. 4, releasing both links. The triangular plates then return to their original position, the first to do so being the one whose chain has not been pulled, shown as the one at the left. Its link then slides further into the housing of the other car, and remains in the position shown in Fig. 5, until the cars part. Then the second plate returns to its original position.



Coupling with protective cover down

The principal feature of the electrical and air portions of the coupler is the sliding cover shown in the third halftone engraving below the car coupling portion of the coupler. This cover, which is pivoted, revolves up and back through the action of the triangular plate, already mentioned, when coupling is to take place.

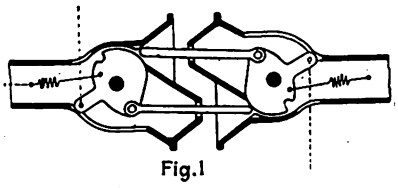


Fig.1

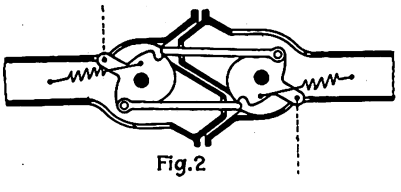


Fig.2

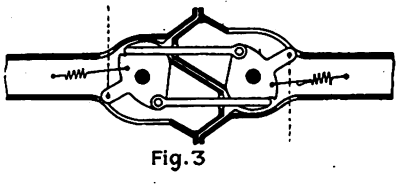


Fig.3

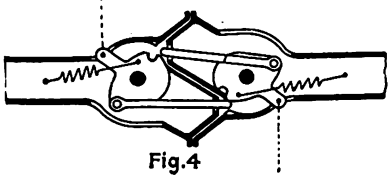


Fig.4

Automatic car coupling operates by double link

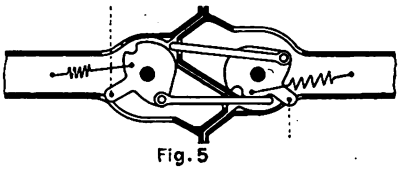


Fig.5

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Valves keep the pressure air pipe closed except when the cars become coupled, and a special electrical switch near the controller in the motorman's cab provides the necessary connections for cutting out any disabled car, making the circuits dead at the time of coupling or any other connections desired.

The car coupling portion of the coupler described is known in Germany as the Scharfenberg type. The electrical and air connection portion of the coupler was developed by the engineers of the Hamburg Elevated Railway.

Calculating Rail Tonnages by a Lightning Method

By Edward A. Roberts
Of Fisk & Roberts, Consulting Engineers, New York

MOST of us have gazed in amazement at so-called lightning calculations as the demonstrator deftly solved an intricate problem of arithmetic by some apparently absurd twist of his numbers. Later study always showed that a definite law of mathematics, and not magic, supported the lightning calculation.

Such a method of calculating the number of gross tons of steel in any given length of railroad has been developed by this organization to simplify the hundreds of calculations that are necessary in making an appraisal of a railway property. For example, consider this problem:

How many gross tons of steel (2,240 lb. to the ton) are there in a stretch of 33.11 miles of single-track railroad built of rail of 70-lb. section (70 lb. to the yard)?

Now to figure that without a handbook means, first, to convert the miles into yards, multiply by 70 to get pounds and divide by 2,240 to get gross tons. Then the answer is wrong because you forgot to multiply by two on account of single track consisting of two rails. The lightning method of getting the correct answer is this:

Write down the number of single track miles	33.11
Write it down again, one space to either the right or the left	33.11
Add the two, setting the decimal point one place further right	3,642.1

The exact number of gross tons of steel in the section of 33.11 miles of single track constructed of 70-lb. rail is 3,642.1. This method is infallible and gives the correct weight to the last ounce.

It is unnecessary to remember whether the second entry of the number of miles is set to the right or the left of the first number. The answer is the same, of course, whichever way the second number is set down. For example:

33.11	33.11
33.11	33.11
3642.1	3642.1

This method of calculating the weight of 70-lb. rail will give the correct answer for any length of rail under the sun. No magic has been used in selecting the particular mileage used in the illustration.

The above method, to be sure, does apply only to calculations involving 70-lb. rail. It can be adapted readily, however, to many other standard rail sections with a simple modification, particularly to 56, 60, 80, 84, 90 and 105-lb. sections. This modification consists of adding to or subtracting from the result obtained above the proportion represented by the difference in weight between 70-lb. rail and the desired rail section. A 105-lb. section is 50 per cent heavier than a 70-lb. section, and the complete calculation becomes:

	33.11	miles of single track
	33.11	
Divide by 2	3642.1	gross tons of 70-lb. rail
Add	1821.05	
Total	5463.15	gross tons of 105-lb. rail

Just one more typical application to a different weight of rail, in this case 80 lb. to the yard:

	33.11	miles of single track
	33.11	
Divide by 7	3642.1	gross tons of 70-lb. rail
Add	520.3	
Total	416.24	gross tons of 80-lb. rail

The reason for dividing by 7 is that 80-lb. rail is one-seventh heavier than 70-lb. rail.

This method of calculating rail tonnages is particularly applicable to field work and to calculations made without the assistance of handbooks and prepared tables of weights. On account of its simplicity it can readily be remembered.

The underlying principle is so extremely simple that it will not be stated here. Those who are interested enough to test the application of the method will enjoy discovering why it is absolutely infallible.

Careful Organization Makes Big Bus Excursion Successful

MORE than 1,200 passengers, members of a large benevolent association, were carried on July 28 on a 108-mile excursion without a single mishap by 56 buses of the Public Service Transportation Company, a subsidiary of the Public Service Corporation of New Jersey. The buses started from Newark at 8 o'clock in the morning and followed a route through Elizabeth, Rahway, Perth Amboy, South Amboy and Red Bank to Asbury Park. Each driver was supplied with a typewritten description of the route to be followed. The first bus arrived at its destination at 11:15. A five-minute stop was made at Morgan, about half-way, where the buses pulled in at a prearranged parking space alongside the road. Returning, the buses left Asbury Park at intervals between 6 and 8 p.m., and the last bus reached Newark about 11 p.m.

All buses were 31-passenger gas-electrics. They were operated in groups of five, each group being designated by a letter and each bus by a number. These designations were placed on placards outside the vehicle for purposes of identification. A supervisor was assigned to each group of buses, riding on the last one of the group. The headway between groups was five minutes. How well this was maintained is indicated by the accompanying reproduction of a headway check taken along the route.

An extra bus was assigned to every third group. This carried no passengers, but was driven by a mechanic. At the rear of the entire procession was a service truck. The only trouble which developed during the entire excur-

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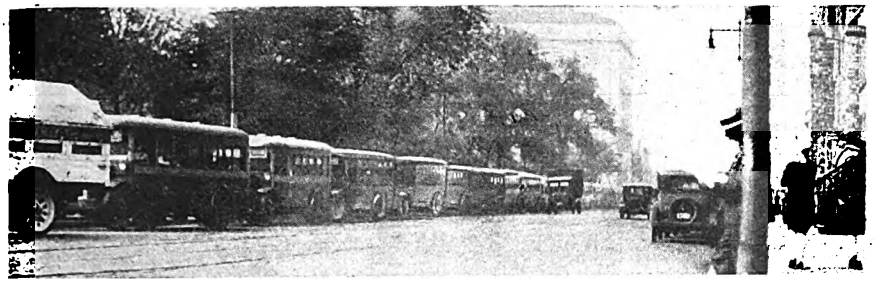


sion was a flat tire. Passengers on the bus which developed the flat tire transferred to the next empty bus which came along. The mechanic then replaced the tire with a spare and soon caught up to the procession again.

Parking was arranged for several days in advance. Two men had been sent down an hour beforehand to complete the necessary arrangements. Buses were stored in a large lot on Ocean Avenue. This was measured off by the advance agent and markers placed denoting the position to be occupied by each group of buses. Two car cleaners accompanied the excursion and cleaned out the buses while the passengers were amusing themselves at Asbury Park.

Above — Start of the excursion from Washington Park, Newark

At left—The headway check shows close adherence to schedule on big bus excursion

Below — Some of the 56 buses parked in a vacant lot near the beach

PASSENGER COUNT (Middle)

TAKEN AT CHESTNUT ST & ST GEORGE AVE

TIME JULY 28 1927 EXCURSION BUSES LINE

To					Asbury Park				
BOUND					BOUND				
Bus	Train	Time Arr.	Pass.	Seats	Bus	Train	Time	Pass.	Seats
5506		9.00	Full	30	2522		10.09	Full	
5508		"	"		2543		"	"	
5511		"	"		506		"		
5507		"	"		586		10.16	"	
5509		"	"		2126		.16	"	
126		9.17	Full		2220		10.19	Full	
543		9.20	"		2165		"	"	
179		"	"		2135		"	"	
2001		"	"		536		"	"	
2043		"	"		2227		10.22	"	
15		9.22	Full						
74		"	"						
2229		"	"		44	Buses			
22		"	2	←					
206		"	Full		2	Extras			
183		"	"						
					1260	Pass			
103		9.27	Full						
106		"	"						
191		"	"						
105		930	Full						
111		"	"						
264		9.39	Full						
96		"	"						
445		"	"						
588		"	"						
618		"	"						
599		9.49	Full						
592		"	"						
469		"	"						
90		"	"						
339		"	"						
597		"	3	←					
983		951	Full						
128		"	"						

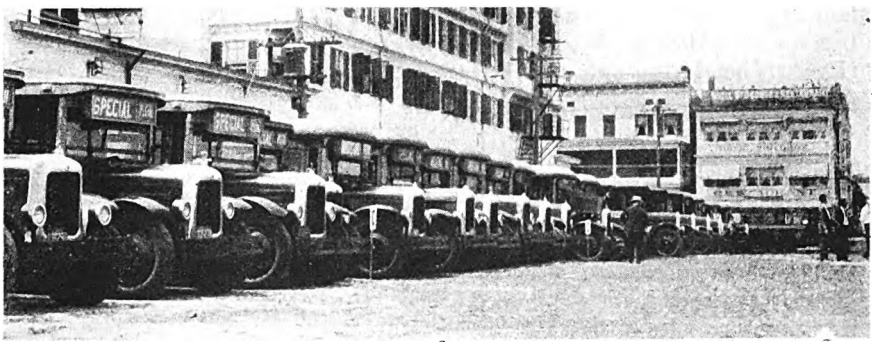
SIGNED R. KNUDSEN

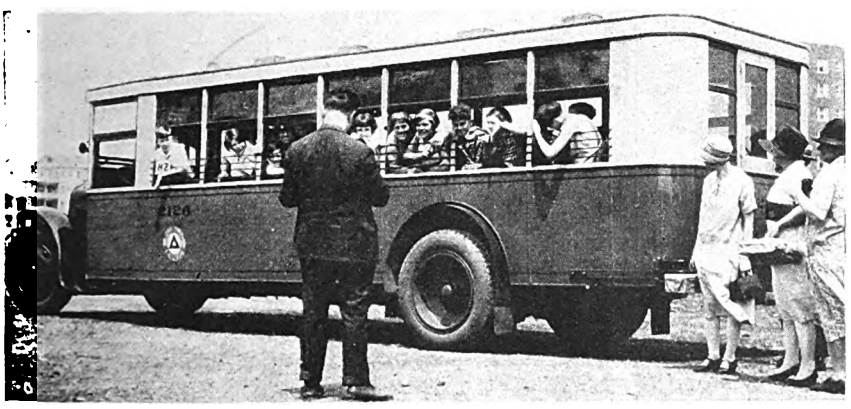
Long Island Cars 100% Steel

ONLY cars of steel construction will be operated for the transportation of passengers on and after Saturday, September 10, according to an announcement made by the Long Island Railroad management.

Early this year the board of directors authorized the purchase of a sufficient number of steel passenger cars to replace every remaining wooden passenger car by the end of 1927. The rapid delivery of these new steel cars makes it possible to remove all the wooden cars in service, sooner than was anticipated by the company.

With the acquisition of nearly 250 steel passenger cars during 1927, at a cost of approximately $5,000,000, and the retirement of 135 remaining wooden cars, the Long Island takes rank as the first Class I railroad in the United States to place its passenger carrying equipment on a 100 per cent steel basis.





Each bus carried a combination letter and numeral designation

Excursionists leaving bus parking area at Asbury Park

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The Readers' Forum

Traffic Control Must Be Fitted to Needs of Particular Situations

CHICAGO SURFACE LINES
CHICAGO, ILL., July 14, 1927.

To the Editor:

It is hardly safe to generalize too much concerning any of the features of signal control of traffic. In general, the short cycle speeds up traffic movement, as stated in the editorial which appeared in ELECTRIC RAILWAY JOURNAL July 30, but we must remember at all times that the setting of a signal system to a given section of street is an engineering job wherein the length of cycle, the time given to the cross-streets, the speed of movement, system of signals, the control of turns or the handling of other special features should be made appropriate to that particular section. It is no more appropriate to use stock methods of handling traffic than it is for an architect to draw on stock plans from his cabinet, regardless of the requirements of his client or of the location on which a building is to be built. Approximately correct results can sometimes be achieved by such treatment, but best results are obtained only by careful study.

If signal control is to be used at a single intersection, the traffic at that intersection will be delayed the least if changes come frequently instead of having a long cycle in operation. Traffic arrives at single intersections in a somewhat uniform volume per ten-second intervals. A driver, however, can slow down slightly when approaching an intersection that has a traffic light set against his movement, so as to arrive at that intersection after the light has changed to green. If the cycle is short few vehicles will be standing still waiting for the light to change. When it does change those vehicles standing and those that are moving slowly to approach will cross the intersection quickly, leaving an open space behind them. Then if the light changes promptly for the other direction the next wave of vehicles will form in a similar way and the intersection will be used actively all the time without much wastage and with only short delays to the vehicles.

When the control is a part of a system, it is advantageous to avoid stretching out the group of vehicles that moves through together, and rather to keep them in reasonably compact form so that each portion of the green light may have its proper and uniform quota of vehicles. If either vehicles or pedestrians on the cross street are held too long there is developed unnecessary impatience and needless delay. It is possible to make much more uniform flow of traffic with short cycles than with long ones.

The length of cycle should have a definite relation to the speed and the distance between cross streets, and it is also influenced by the interference that is occasioned by the kind of turns permitted, the volume of pedestrians, the physical handicaps to free movement of vehicles at a given intersection such as street offsets, restricted widths of lanes, improper contour of paving and sharp curb corners. Sometimes the cycle may be either of two lengths which will differ considerably, such as either 60 seconds or 100 seconds. In one instance where these two cycles were tried they gave substantially the same speed, but one gave greater street capacity than the other, because the longer of the two permitted longer movements at intersections where handicaps to movement prevent a reasonable number of vehicles passing through under the short cycle.

Conflicts at troublesome intersections are sometimes aggravated with too frequent changes. For example, in our recent check of the effect of a 75 second cycle as compared with an 85 second cycle in the heaviest evening rush hour on Wabash Avenue, we found that due to both right turns and left turns for vehicles and almost capacity use of the street, the number of vehicles in one block waiting for the green light in the next intersection ahead could not pass through that intersection on the shorter cycle. With the longer cycle and less frequent changes the vehicles and street cars could pass through the loop with fewer missed lights. On the streets more lightly used, such as Clark Street, the shorter cycle with more frequent changes permits each block to be made in a shorter time, and therefore a greater speed was attained by each street car or vehicle.

It is the desire to avoid an appearance of inertia of traffic and to permit a group or wave of vehicles to pass through a street with the fewest number of stops that has led the users of synchronously controlled systems to adopt longer cycles, and having got the mass in motion, to keep it in motion as long as seemed tolerable for the cross traffic. However, the co-ordinated control breaks this traffic up in smaller groups by frequent changes in signals at the entrance to the system, and then so arranges the signals that these vehicles once started may keep on traveling without the waste that comes from stopping the group and then starting it again.

E. J. MCILRAITH,
Staff Engineer.

Kansas City Cars Handle Record Crowd

THE Kansas City Public Service Company handled the largest crowd in its history on Friday night, Aug. 5, at the motion picture party of the Kansas City *Star*. Sixty thousand people attended the first showing in Kansas City of "The Rough Riders," and of this number only about one-tenth could find parking space for their automobiles. The remainder were transported by street cars. Thousands used their cars to approach as near as possible to Muehlebach Field and rode the rest of the way on the street cars.

Early in the evening 75 extra cars were placed on the Brooklyn and crosstown lines leading to the field. Within an hour this had to be increased until the company had 300 extra cars transporting the greatest single-event crowd in Kansas City's history. There were no traffic jams. Motorists were not allowed to park between 18th and 21st Streets, the region of the field.

When the performance was over the 60,000 people were removed by the street cars in an hour and ten minutes without trouble. The crowd moved quietly, and outside the field D. L. Fennell, general superintendent of transportation for the Kansas City Public Service Company, had a string of 300 cars, standing fender to tail light from 31st Street to 10th Street. Extra lamps strung around the field by the company flooded the neighborhood after the show ended and enabled the vast crowd to reach the street cars with ease and rapidity. The company had 141 employees on foot between 18th and 31st Streets in directing and expediting traffic.

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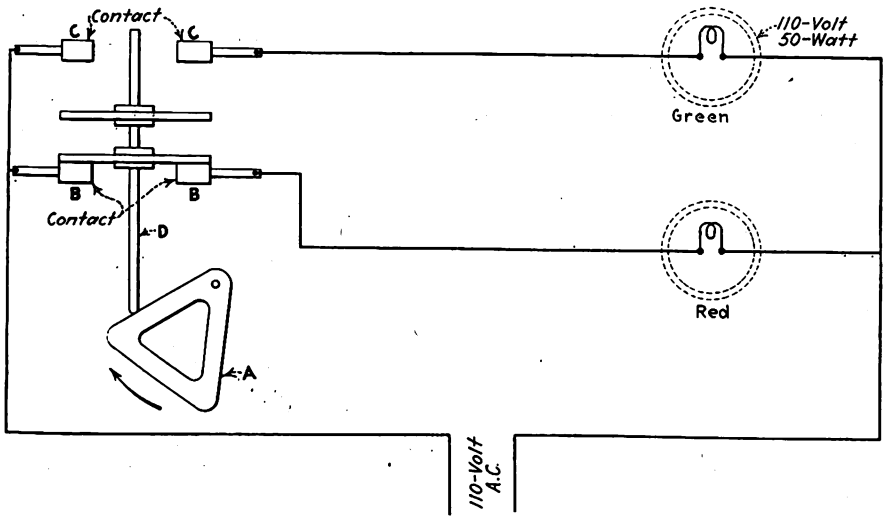
Maintenance Methods and Devices

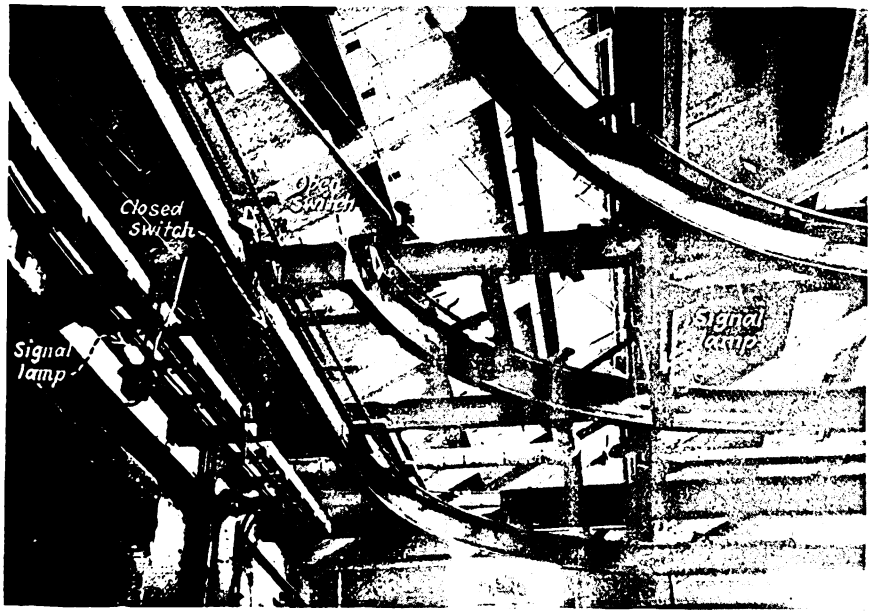
Signal System Prevents Telpher Derailments

WHERE a number of telpher cranes are operated at a high rate of speed and where switches are constantly being thrown from one rail to another there is a possibility of derailment due to running through an open switch. To minimize this danger the Interborough Rapid Transit Company of New York developed and installed a simple signal system which automatically protects an open switch with a red light and gives the right of way to the closed switch with a green light.

The telpher switches are operated by hand and when opened or closed come in contact with a safety stop which is connected through a movable arm to a set of interlocks controlling the red and green signal lamps. With the safety stop "A" in the position shown in the sketch the red light is in operation, indicating that the switch is open. When the switch is closed stop "A" moves upward as indicated by the arrow, moving the relay arm "D" upward, closing contact "C" and opening contact "B." This puts the green light in operation and extinguishes the red signal.



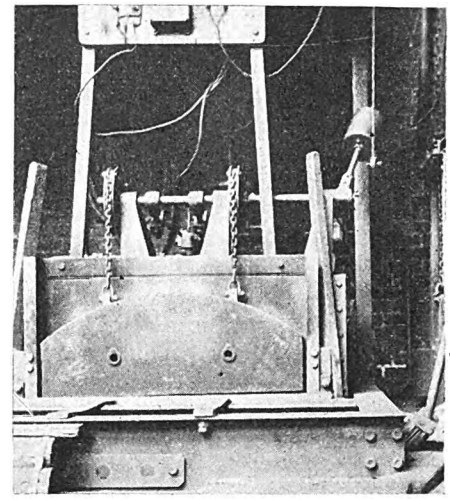
Wiring diagram shows connections to telpher signal lights. Relay-rod "D" is raised or lowered by operation of safety stop "A"



Simple signal system on telpher tracks in Interborough shops prevents derailments

Electrically Controlled Gas Oven for Heat Treatment

ONE of the most convenient parts of the equipment of the shops of the London County Council Tramways, London, England, is an electrically controlled gas oven for heat



This automatically regulated heat treatment furnace has been found very convenient for tires, brake riggings and similar parts

treatment of tires, brake rigging and other parts for which such treatment is suitable. Its advantage is that they can be left in the oven without fear of injury as the temperature cannot rise above the predetermined temperature. The automatic control is obtained by a thermocouple which actuates the regulator admitting gas and air into the furnace. Another feature of the furnace is that when the door is raised the gas is shut off automatically so that there is no burst of flame. These features make the equipment much easier to handle.

Incidentally, it might be said that all steel tires on this tramway system are now being refinished by grinding, rather than being turned on a lathe. This method is found to give a great saving in material over re-turning, the saving amounting each year to about 300 tires.

There is also a saving in time, as one grinder can finish twelve pairs of wheels a day as compared with five or six pairs a day turned on a lathe. Axle fits are also now being ground instead of being turned. An improvement in brake rods recently introduced has been the repair of broken rods by butt welding by

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the electric transformer method rather than by forging. Since the introduction of the electric butt welding machine for this and other work for which it is adapted it has been possible for the shops to shut down two smithies with six men.

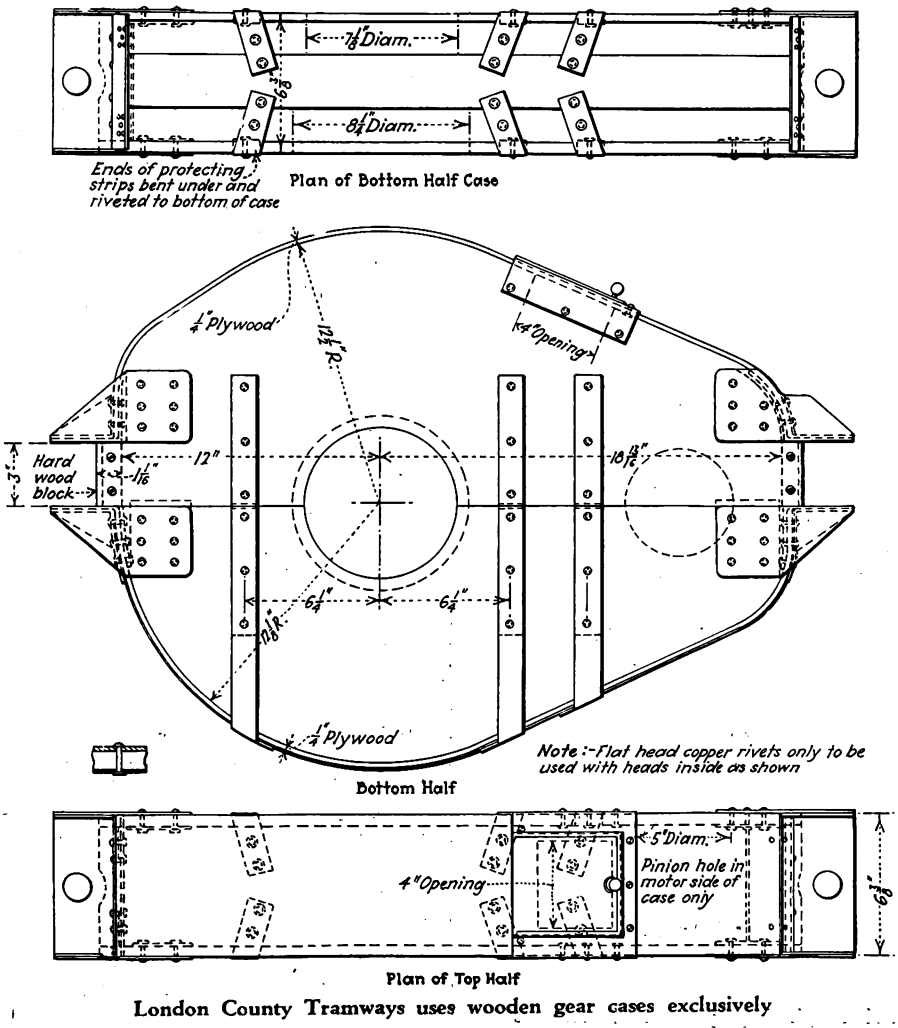
Wooden Gear Cases Are Used in London

ON ALL of its motor equipment the London County Council Tramways of London, England, is using a wooden gear case made in its own shops, for which a number of advantages are claimed. One advantage is that it is lighter than a steel case. A second advantage is that if injured the case can be repaired more easily. There is finally the thought that a wooden gear case may reduce the noise of the gears, although there is no definite information on this point.

The gear case is made of whitewood, strapped with No. 12 or No. 20 malleable steel straps. The top and bottom parts are of ¼ in. plywood, which is steamed and bent to shape before being nailed to the sides. The nails used are 1 in. with a screw thread. A strap of No. 20 s.w.g. gage malleable steel protects the bottom from injury. All rivets used are of copper with a flat head inside the gear case.

Before being put into service each half of the gear case receives not less than four coats of gray enamel, each being thoroughly dried before the next is applied, to insure that the surfaces, especially of the interior, are finished with a hard, glossy and oil-repelling coating.

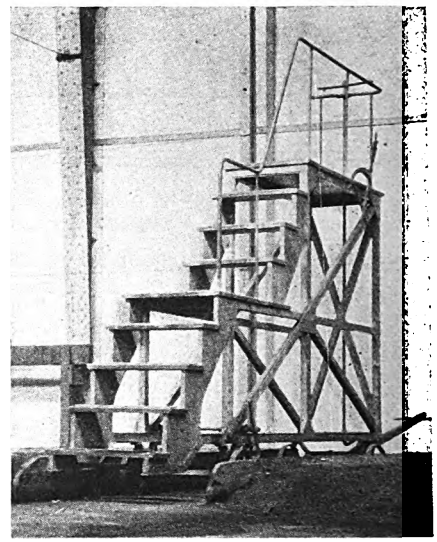
The cost of the gear case is about 50 shillings ($12) each.



London County Tramways uses wooden gear cases exclusively

Ladder for Depot Inspection of Cars

MOVABLE ladders or scaffoldings for the use of car inspectors are part of the equipment of the carhouses of the Berlin Surface Lines, Berlin, Germany. One of these ladders, shown in the accompanying illustration, is mounted on six wheels and can be pulled from one corner of the carhouse to another very easily by a handle in front. It is also fitted with a brake which is set from the upper platform. This upper platform is high enough so that the trolley and other parts on the roof can easily be inspected from it. As the motor resistances in Berlin are carried on the roof instead of underneath the car, roof inspection has to be somewhat more thorough than otherwise. There is another platform on the ladder about half way down.



Movable ladder used for car inspection in carhouses of Berlin Surface Lines

Prolonging Life of Steel Ties in Concrete

By Louis T. Botto
Superintendent Maintenance of Way San Antonio Public Service Company, San Antonio, Tex.

BEFORE placing the concrete in steel tie track construction a final test should be made to make certain that each tie bolt is tight. Each bolt should be given a tap with a light sledge and then the nut should be given its final turning.

Good results in concreting are obtained by using a 1:3:5 mixture. If the sand varies in color or texture it should be tested to insure that it will make good concrete. Sound materials are essential. The amount of water in the concrete should be kept as low as possible to permit proper workability and the concrete should be tamped thoroughly under and around the ties and rails. It is good practice to delegate a man to see that this tamping is performed carefully.

After concreting, traffic should be kept off the new work for at least fifteen days and the concrete should be kept damp during this period. With the observance of these simple precautions, under ordinary conditions steel tie construction should last the entire life of the rail.

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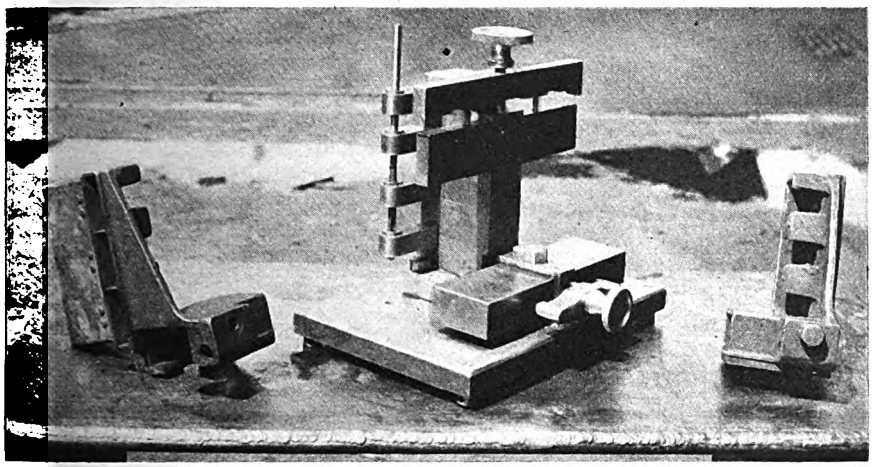
Combined Gage and Jig for Brush Holders



A combination jig and gage for Westinghouse type 50L brush-holders is shown in the center. On each side is a brush-holder, one right hand and the other left

THREE carbon brushes per brush-holder are used with the Westinghouse type 50L railway motor. The $\frac{5}{16}$-in. pin about which the pressure adjusting mechanism pivots passes across the entire width of the brush-holder and through lugs at each of the partitions separating the brushes. It is thus necessary to drill four holes in the brush-holder lugs in order to insert the pin. These holes must be located accurately so as to line up with each other and also so as to be in a plane perpendicular to the brush-holder support.

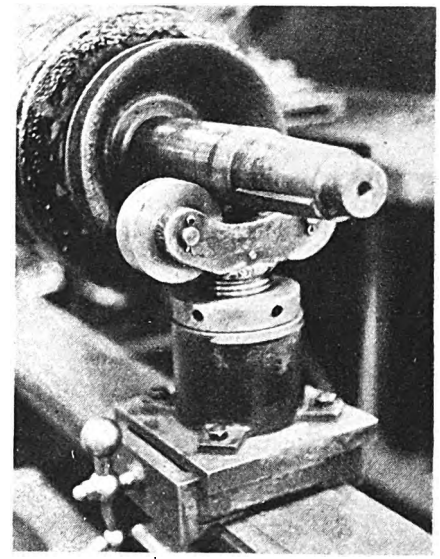
When these brush-holder holes become worn it is the practice of the Brooklyn - Manhattan Transit Corporation, Brooklyn, N. Y., at its 39th Street repair shops to fill in the holes by welding and then to redrill them. For this work a convenient jig has been constructed. in which a pair of brush-holders, one right and one left, can be inserted and drilled with one setting. The jig has a rectangular steel bar just above the base plate over which the casting support fits. The upright portion of the jig is arranged with four arms which project out and fit on either side of the carbon brush separating partitions. In order to place a brush-holder on the jig it is necessary for the carbon boxes to be perpendicular to the section which fits about the support. Any distortion of the brush-holder castings will prevent their being shoved into position and so the jig serves as a gage for making certain that the brush-holders are in proper alignment. With the brush-holders in position they are clamped tightly by two knurled knobs. The entire fixture with the two brush-holders in position is then placed on a drill press and the holes are drilled in one operation.

The accompanying illustration shows the jig with two brush-holders, one on either side. The drill is shown in the bushings of the arms so as to indicate just how the holes for the pivot pins are drilled.

Aligning a Commutator for Slotting

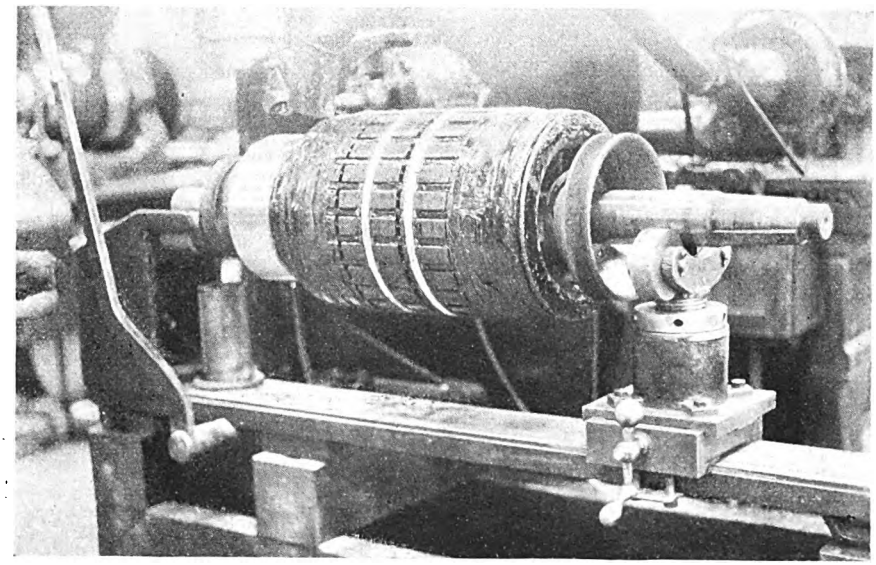
TO INSURE accurate slotting of commutators a valuable attachment has been developed and installed on the commutator slotter used in the shops of the Market Street Railway, San Francisco. This consists of a tailstock mounted on the bed of the slotting machine which allows for the transverse movement of the pinion end of the armature so that the travel of the milling cutter may be made to follow the slot in the commutator. Rarely is the commutator assembled with the slots directly in line with the shaft.

The tailstock allows for this transverse movement of the pinion end of the armature and also for raising and lowering. It slides freely on the bed of the machine. Incorporated in the base is a feed screw which moves the upper part across the baseplate, similar to the cross feed on a plate. The upper part includes a large diameter elevating screw with supporting nut having holes for a spanner wrench. The head of this screw is Y-shaped with 3-in. rollers mounted on pins near the ends of the frame.



Tailstock allows for both transverse and vertical movement of gear end of armature shaft

The cross feed is similar to that used in a lathe. The elevating screw is similar to those in house jacks. The two rollers in the Y frame are identical with two in the head of the machine



Commutator slotter equipped with tailstock to allow for accurate alignment of commutator segments with the milling cutter

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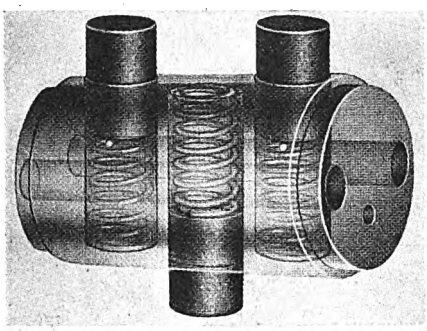
New Equipment Available

Improved Features in Trolley Wheel

AUTOMATIC lubrication by means of graphite plugs is an outstanding feature of an improved trolley wheel being marketed by the Ohio Brass Company, Mansfield, Ohio. Three graphite plugs provide sufficient lubricant for at least 30,000 miles of service. The plugs are compounded especially for this service and provide for lubrication throughout the life of two O-B wheels. They eliminate the use of oil or grease.

The graphite plugs are inserted in the axle and are pressed outwardly



Three graphite lubricating plugs provide lubrication for the trolley wheel

against the wheel bearing surface by means of three coil springs. Two of the plugs press against the bottom of the wheel bearing and one against the top. They are of sufficient size and spaced closely to insure constant lubrication of the entire bearing surface of the wheels.

Unusually large closely fitted bearing areas for the axle and harp are provided. One-half of the axle bearing area is always in close contact with the wheel, while the machined butting areas of the axle are clamped solidly against the equally large contact areas of the harp, which eliminates brush contact washers and springs. The axle is made of hardened cold-rolled steel and is ground accurately to size. Its area is three to four times the usual area of the pins generally used in old-style trolley wheels and harps. The axle is bolted solidly against the two halves of the harp by two bolts which pass through the axle. These bolts can be drawn up as tightly as desired without affecting the operation of the wheel. Thrust washers made of special Bakelized fiber are placed on each end of the axle between the wheel hubs and the harp to prevent end play of the wheel and contact with the harp. These washers prevent arcing between the wheel and the harp and resist moisture.

The wheel itself is cast of a high-grade bronze alloy developed particularly for electric railway service. The harp is made of Flecto malleable iron, which is claimed to be free from brittleness. It is hot-dip galvanized.

Cold Steam Cleaning Equipment

EQUIPMENT for cold steam cleaning of automotive equipment has been announced by the Cold Steam Corporation, Charlottesville, Va. It includes a boiler with necessary connections and a cold-steam nozzle. The boiler is of the vertical fire tube type, designed for working pressures up to 200 lb. per square inch. It is made in accordance with the American Society of Mechanical Engineers boiler code.

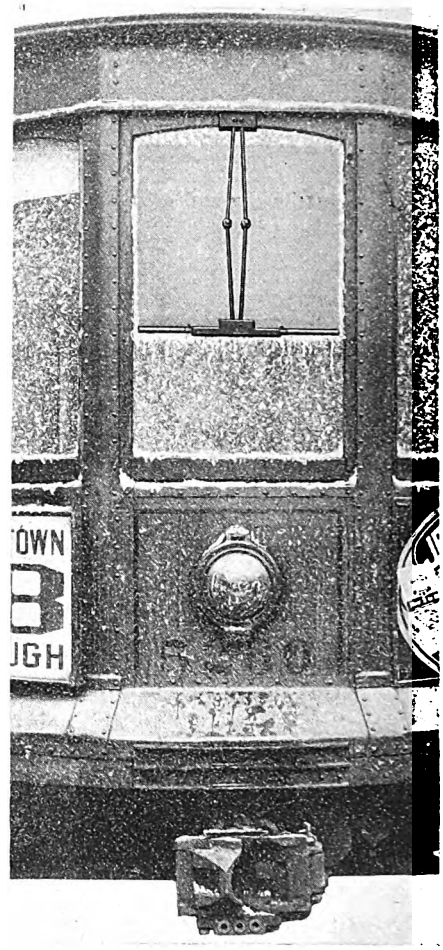
The burner is either of the gas type or the fuel-oil burning type, the former being recommended for use where natural gas is available or where the pressure of artificial gas is sufficiently high. In the oil-burning equipment fuel or furnace oil is used. Preheated water is fed to the boiler by means of a positive driven pump which is controlled automatically and maintains a constant level of water in the boiler. As a further precaution the controller is fitted with a low-water alarm whistle which gives warning should the water fall below the normal level.

Steam is piped from the boiler to the washstand where the steam hose is attached. A cold steam nozzle is provided which is provided with connections to both the steam and water lines. As steam is used at a pressure of about 150 lb., this passes through the nozzle and picks up and mixes with the water in whatever quantity desired. This quantity is determined by the operator according to the needs of the cleaning job and is adjusted by means of the nozzle.

Where it is desired to use some form of soap mixture or other liquid cleaner, hose lines may be attached to their containers and by turning a valve the contents are projected through the nozzle as desired. Two or three-way valves may be used in the water line.

Vertical Moving Window Wiper

SURFACE of 24 in. wide and 22 in. long is cleaned by a vertical window wiper which is a product of the Cinch Manufacturing Corporation, Chicago, Ill. This wiper was designed and perfected in co-operation with several electric railway companies where trials have been made. The principal feature of the Cinch ver-



Window wiper in its lowest position. It returns to the top automatically by spring pressure

tical swipe is that glass is cleaned by a vertical movement, so that rain or snow are carried downward and out of the way.

The movement of the wiping part is by means of a pantograph with two arms pivoted at the top of the sash. The outside pantograph frame is caused to move by the turning of a handle which is fastened to a shaft projecting inside the vestibule of the car. By turning the handle through an arc of 45 deg. the swipe is brought to its lowest position and it returns automatically to the top by spring pressure. In its normal position the swipe is at the top of the glass so as not to obstruct vision.

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News of the Industry

Trial Run in Rochester's Subway

Following an inspection trip by railway and civic officials and industrial leaders in the first car ever operated by electricity over Rochester's new subway in the bed of the abandoned Erie Canal, it was announced that the line will start operation about Sept. 15.

It is expected that the interurban cars of the Rochester & Eastern and the Rochester & Syracuse Railroads will be the first to run in the city-built line. City surface cars will not be diverted into the subway until the signal system is completed about Dec. 1.

The Common Council favors operation of the line by the New York State Railways for a three-year trial period under terms similar to those that apply to the city trolley and bus lines, conducted under a service-at-cost contract.

The trial run was made from Winton Road at the extreme eastern end of the line to City Hall Station at the rate of a mile a minute. The entire 9 miles of the subway, which bisects the city, following the route of Clinton's "Big Ditch," was covered by the party.

The new line will not only take all interurban and much surface traffic off the streets, but will provide added switching facilities for industries along the line, under separate contracts to be made with the five steam railroads entering the city.

Civil Service Suggested for Detroit Employees

A movement has been started in Detroit which, it is believed, will ultimately result in the establishment of city civil service for employees of the Department of Street Railways. Del A. Smith, general manager of the D.S.R., recently asked the Corporation Counsel's office for an opinion as to whether the charter or the department regulations permit the discharge of employees because of nationality.

Mr. Smith is quoted as having stated that should the Corporation Counsel agree with the opinion that it is within the power of the Street Railway Commission to adopt any regulation it sees fit to govern the selection of employees, he would ask the commission to adopt a rule barring from the D.S.R. employ aliens who have had an opportunity to become citizens but have not availed themselves of it.

It is stated that 50 or 60 alien employees of the department have taken out their first papers. Mr. Smith believes that men not interested in the city sufficiently to become citizens should not be connected with a government department.

Mayor John W. Smith has announced that he will ask the Street Railway Commission to place the D.S.R. under civil service, and an opinion has been received by him from the Corporation Counsel's office to the effect that it is mandatory upon the city to amend its Charter in conformance with the Home Rule Act, and establish a D.S.R. civil service system. The Corporation Counsel's office also has under consideration the request of the D.S.R. general manager regarding the status of alien employees of the D.S.R. and the opinion has been expressed that the D.S.R. has the right to make its own rules regarding aliens.

The Mayor's action is said to be opposed by officials and representatives of the Amalgamated Association. Following a brief meeting between them, the Mayor and union representatives declined to make any announcement about the outcome of their talk.

Expert Recommends Co-ordination for St. Louis

Report not made public, but Mayor reviews his attitude toward subjects about which differences of opinion exist

ROBERT M. FEUSTEL, who recently made a survey of the St. Louis railway situation at the request of Mayor Victor J. Miller, in a report submitted to the Mayor is understood to have recommended co-ordination of buses and street cars with a service-at-cost franchise as the best solution of the city's railway needs.

Mayor Miller has not determined whether a franchise shall be granted to the St. Louis Public Service Company when that organization takes over the United Railways properties, probably in October. The original plan of the reorganization committee of the United Railways was to secure a 30-year service-at-cost franchise for the new company with the right to earn 7 per cent on a valuation of approximately $60,000,000. Subsequently this offer was withdrawn because the city administration had failed to act within the time limit fixed by the company.

The contents of the report of Mr. Feustel to Mayor Miller will not be made known at this time. However, the Mayor and Mr. Feustel are said to be in agreement on the fundamentals of the St. Louis situation.

The suggestion of co-ordinated bus and railway transportation is not new for St. Louis. Several years ago the reorganization committee endeavored to purchase the competing People's Motor-bus Company, but the parties could not agree as to price. Subsequently the reorganization committee formed the St. Louis Bus Company to supplement its railway service.

In this connection it is interesting to note that the Mayor is of the opinion that municipal ownership of the city's street car system would not solve the railway problem. The Mayor said:

> This problem cannot be solved in a few days. Within the next five weeks I intend to have formulated a policy with regard to the properties of the United Railways, its ownership and future possibilities.
>
> Urban railway transportation is in a state of change and it is very difficult to forecast just what transportation facilities will be most useful for the city within twenty-five or fifty years.
>
> The city will probably employ several experts from other municipalities to aid in solving our problems. I intend to ask the Board of Aldermen for an appropriation for this purpose as soon as I can. I do not know as yet where we will go for our engineers and consultants.

Mayor Miller has outlined four ways of meeting the St. Louis railway problem. His suggestions briefly are:

1. Allow company to continue under existing franchises. This would make it difficult for the company to secure loans over a long period of time for financing and operation purposes.
2. Municipal ownership.
3. Semi-public ownership. Under this plan the city would build and own the facilities and lease them to an operating company.
4. Adopting of a service-at-cost franchise or some similar plan.

The city administration has favored a service-at-cost plan, but failed to

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Sept. 13-15*—International City Managers Association, Dubuque, Ia.**

***Sept. 19-23*—American Welding Society, national meeting, Book-Cadillac Hotel, Detroit, Mich.**

Sept. 26-30 **— National Safety Council, annual congress, Hotel Stevens, Chicago, Ill.**

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

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agree with the reorganization committee of the United Railways on the valuation for rate making purposes or the amount of return the company should be permitted to earn. The reorganization committee asked for a 7 per cent return, but Mayor Miller contended that 6 per cent was sufficient.

Baltimore Hearings Started

The Maryland Public Service Commission started hearings on Sept. 6 on an application made by the United Railways & Electric Company, Baltimore, for an emergency increase in fares pending later action on the company's application for a 10-cent fare. The entire hearing was devoted to determining whether an emergency exists that necessitates an immediate increase.

Thomas J. Tingley, People's Counsel, led the opposition to the increase. Charles C. Wallace, City Solicitor, and lawyers for various organizations also joined with Mr. Tingley in opposing the increase.

Charles Markell, who represented the United, told the commission that the United had been operating since 1920 under rates that were confiscatory. He pointed out that the commission said several years ago that the company should earn a net of at least $1,000,000, which would be a fair and reasonable return on its investment, but this amount was earned only in 1926, when the greatest economies were instituted. The income of the railway since 1920, he said, has fallen short of the minimum of minimums.

The company has been operating at zero and finds it cannot operate below zero, Mr. Markell told the commission. He denied that the number of passengers on short rides had decreased because of fare increases and also said that people ride in automobiles because they want to and not because of the car fare charged. Mr. Markell also declared that if the fare were lowered to 5 cents it would have no appreciable effect on the number of car riders.

Mr. Tingley replied to Mr. Markell and denied that the need of an emergency increase existed. He said the company had not instituted every possible economy.

Cites Court Decisions on Cost of Removing Conduits for Chicago Subways

Opinions rendered to the Chicago City Council on Sept. 2 by Assistant Corporation Counsel James W. Breen indicate that the expense of removing and relocating pipes, wires and conduits in connection with subway construction or other improvements must be borne entirely by the public utility companies. Mr. Breen cited numerous Supreme Court rulings which sustain this requirement and refuse to allow such expenses in cases of subway building to be added to the subway rental and indirectly saddled upon the rider.

Convention Guests

MEMBERS of the American Electric Railway Association can extend the privileges of the Cleveland convention to their guests as in past years by registering them on the forms provided at the registration desk. Better still, guests should be pre-registered on the forms distributed to members some time ago. Use of the pre-registration cards will obviate the delay when entering the auditorium, as the badges will then be ready in advance and presentation of the duplicate card will complete the registration.

For those who wish to extend the privileges to guests for a single day only, guest tickets have been provided which will admit the bearer to the convention and exhibit. These tickets will be collected at the door. They are intended particularly for company members in Cleveland and vicinity which desire to have employees and others visit the convention without remaining for the entire time. They may be obtained on application to the executive secretary, J. W. Welsh, 292 Madison Avenue, New York City.

Problems of Salt Lake Company Explained

Rerouting of the Poplar Grove cars of the Utah Light & Traction Company, Salt Lake City, Utah, has been ordered by the Public Utilities Commission, the test to continue for a period of six months from the date on which it begins. This decision was reached at the hearing on the application of the company to abandon service and remove its tracks on Seventh South Street between West Temple and Eighth West Streets. The hearing was continued to the end of the six month test period. In the meantime, the tracks which the company sought to remove on Seventh South Street will be allowed to remain during the six months trial of the new routing.

Edward A. West, general manager of the company, testified that the cost of operating the cars over the section of road it was sought to abandon was $1,085 a month, while the average monthly revenue on that section was $370, leaving an operating loss of $715. There are twenty railroad crossings over which the company's cars pass in going over the Seventh South line. It is largely to eliminate the maintenance of those crossings that the company desires to discontinue service on West Seventh Street.

Mr. West testified that many portions of the system were not paying and that to serve the public best those sections should be pruned from the system. He said the railway had been laid out before the coming of the automobile, and that the system now is too large for the demand of the public.

Salt Lake has 1 mile of trackage for each 1,200 people, while the average in cities of comparable size is 1 mile of trackage to each 2,000 inhabitants. Mr. West declared that average earnings in Salt Lake are much lower than elsewhere, being only 30 cents per mile, compared with 44 cents per mile nationally. The maximum earned on any line in the Salt Lake system is 36 cents per mile, while the minimum is 8 cents. He declared that on the Seventh South Street line the average was 8 cents and that on the North Yard line it was 15 cents.

The commission will conduct a hearing at once on the application of the company to discontinue service on the Holliday line south of Thirty-third South Street. Hearing on the application to discontinue the Mill Creek bus line is also scheduled.

Reconsider Unlimited Term Franchise Bill at Chicago

A decision on the part of the local transportation sub-committee of Chicago, Ill., to reconsider its removal of the 40-year limit on franchises in the legislature marked the only new development in that quarter during the past week. The bills were drafted recently to facilitate settlement of Chicago's traction problems. In revising Senate bill No. 439, one of the Insull traction bills which was defeated in the legislature last June, the aldermen struck out the 40-year clause and substituted the recommendation that the City Council be empowered to grant a permit for 20, 50, 75 or any other number of years. Critics immediately assailed the measure, however, on the score that no protection would thereby be afforded against a perpetual grant. In consequence of this protest the subcommittee decided to reconsider its action at a subsequent meeting. The redrafting of the other 4 bills was completed on Aug. 31.

New Outing Bureau in Chicago Benefits Electric Lines

During the first month of its establishment, the outing and recreation bureau jointly maintained in the city of Chicago by the transportation companies and other local utilities under the management of Samuel Insull and associates has received and answered more than 16,300 inquiries about low-cost vacation trips in the metropolitan area, officials of the bureau recently announced. Telephone calls totaling 12,880 and approximately 3,500 personal calls for outing information were handled in that period and more than 38,000 pieces of vacation literature issued.

The bureau was opened on June 27 to furnish the public with suggestions for outings, vacations, picnic and sightseeing trips in and around Chicago. Attractive, inexpensive jaunts to many nearby resorts and parks have been mapped out by the bureau with full information as to costs, length of trip, things to be seen, etc. The service is free.

Striking window displays of vacation scenes and a large variety of folders

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and maps describing the scenic and recreation facilities of the region have been used to promote the service rendered. Among the transportation companies interested in the bureau are the Chicago Rapid Transit Company, Chicago, North Shore & Milwaukee Railroad, Chicago, Aurora & Elgin Railroad, Chicago, South Shore & South Bend Railroad and the Shore Line Motor Coach Company. The bureau also serves as a consolidated ticket office for these companies.

Pennsy to Electrify Baltimore Lines

Electrification of the Pennsylvania Railroad in and near Baltimore within the next three years appears to be in prospect. George M. Smith, superintendent of the Baltimore division of the road, recently indicated that the company's roads in and near Baltimore will be electrified and the power used in operation of freight and passenger trains by 1930.

One-Man Car Suggestion Opposed in Los Angeles

Local railway states its case against use of this equipment under peculiar conditions that exist in Pacific Coast Utilities

AT A RECENT hearing before the California Railroad Commission on the application of the Los Angeles Railway for increased fares, the chief engineer of the commission recommended the operation of one-man cars in Los Angeles as a measure of economy. Several different plans were proposed. They included one-man car operation throughout the city, and a zone plan operating two-man cars through the central district and changing to one-man operation outside.

The company is opposed to the suggestion. Figures in the hands of the railway show that the operation of one-man cars would not be a measure of economy in Los Angeles, particularly since the present type of equipment is not adapted to this operation. The engineering department of the railway estimates that the interest charge alone on the capital investment required to make the change would be more than $170,000 a year, which must be deducted from any possible savings. The commission's engineers estimate that a year would be required to put the proposed system into effect.

According to the company there will be besides this the following, all militating against the proposal:

The additional cost of breaking in, as every man would have to be qualified not only as a conductor but as a motorman as well. The San Diego Street Railway reports that approximately 5 per cent of its trainmen cannot qualify for one-man car service. The percentage in Los Angeles would probably be about the same.

Additional supervisory, instruction and cash receiver forces to handle this work, with resulting heavy increase in payroll.

Difficulties of the operator having to stop to pull switches, plug them and going back to take plug out before proceeding.

Additional hazard at railroad crossings on account of flagging.

Greater delays in the case of accidents or blockades.

An increase in the possibilities of hold-ups.

Fenders of the present type are too heavy for one man to handle. This type of fender is used on account of a city ordinance and must be changed from one end to the other at every terminal every trip.

The opinion of the management is that on the Los Angeles system, with the extremely heavy passenger pick-up at many transfer points, and at practically all terminals it would be impossible for one man to handle the situation; and increasing layover time runs into a great deal of money. As the officials of the company see it the cost of one-man operation might be greater than operation under the present man power, not to speak of the easily figured inconvenience and delay to passengers and general street traffic. A loss of 1.38 miles in every car-hour means that during the average week day 10,000 fewer miles would be traveled under any of the suggested one-man operation plans than at present and 60 additional slower moving cars would be on the streets.

St. Paul Seeks Relief From Heavy Expenses

The St. Paul City Railway, St. Paul, Minn., is working for an amendment to the city charter to carry out a recommendation by the Minnesota Railroad & Warehouse Commission made more than a year ago that the city remit some of the expenses under the present charter in regard to paving. The company is now required to do work that costs $56,000 a mile. It estimates that paving relief will reduce operating expenses $115,000. This would make a more reasonable return to the company at the present rate of fare of 8 cents cash or 6 tokens for 40 cents.

It is the contention of the company that paving between the tracks began with the horse car, when the horse motive power wore out the road. Although the electric car does not do this the car rider is still saddled in that city with a charge that prevailed 50 years ago.

Under the proposed amendment the Council will be able to relieve the company of all paving and foundation for paving and maintenance of both; also to relieve the company of all charges for street sprinkling, cleaning, sweeping and removal of snow and ice from the streets except from the tracks.

Wage Reduction Plea Rejected by Oakland Men

A proposal of the Key System Transit Company, Oakland, Cal., to its platform employees urging that they accept a reduction in their wages of 5 cents an hour has been rejected and the uniformed operators will stand by their agreement of two years ago with the company.

This was revealed following a meeting at which the executive committee presented the "suggestion" of the company to the men after debating the merit of the request for ten days.

It was announced that the reduction in wage was essential to the company because its financial condition is "desperate and critical" and that the need for economy on the part of the employees will remain for a year only. The alternative proposition that the employees keep their present wage and accept changes of hours that would result in a similar reduction was also voted down by the operators.

New Fare in San Antonio

A "compromise" schedule recently operative on the lines of the San Antonio Public Service Company, San Antonio, Tex., reduces the price of weekly nickel tickets from 30 cents to 25 cents, but otherwise leaves unchanged the fares, ranging up to 10 cents for adults. It places bus fares within the city limits on a parity with trolley fares (outside the city the fare is 2 cents additional on either bus or street car). The new rates also authorize sale of books, good for 30 days, giving children under seventeen years old forty rides for $1.20 or 20 for 80 cents.

This "reduced" schedule of car and bus fares has ended, at least temporarily, a controversy waged since the San Antonio Public Service Company several weeks ago, increased cash fares from 6 cents to a maximum of 10 cents. All members of the City Commission failed to agree to the new schedule, which is in the nature of a compromise, but a deadlock in the commission prevailed to prevent proposed granting a franchise to a new bus concern that offered a 5-cent transportation. This deadlock also blocked a proposed independent audit of the present railway company's books. The company never conceded the the city's right to require the latter's consent to a change of fares.

The increased car fare schedule, in effect since July 10, made the cash fare 10 cents, but provided for the sale of three metal tokens for 25 cents and for the sale at 30 cents of transferable tickets which permitted holders to ride for one week at 5 cents additional per ride. Children's rate was raised from 3 to 5 cents straight, and for school children under seventeen a 10-cent cash fare. In both cases a ticket rate was established.

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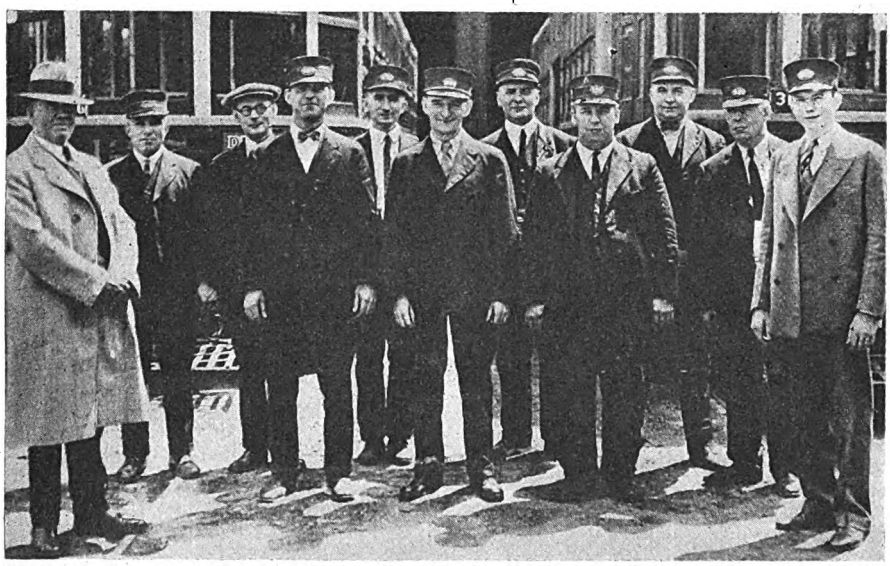
Railway to Resume in Mount Clemons

Railway service is to be resumed in Mount Clemons, Mich. Bus service operated on the streets for the past six weeks was termed unsatisfactory and the Detroit United Lines was ordered by the City Commission to place the line back into service. Petitions are being circulated in Lake township for restoration of interurban service on Jefferson Avenue. The service was stopped by the village of St. Clair Shores at the expiration of the franchise on July 21.

North Shore Line Provides Inter-Line Ticket Sales Service

A new interline ticket sales service whereby through tickets to any point in the United States served by a steam or electric railroad can be purchased at any of the company's passenger stations, has been started by the Chicago, North Shore & Milwaukee Railroad. Interconnecting ticket arrangements, including Pullman reservations with all steam lines in the country, have been established for the convenience of North Shore Line patrons. Arrangements have also been made with the Parmalee Transfer Company in Chicago for the free transport of North Shore Line passengers and hand baggage from downtown stations to all steam railroad terminals.



A careful crew rewarded for what it could do

New Paper in Richmond

The first number of a magazine for the employees of the Virginia Electric & Power Company, Richmond, Va., has been issued. Nameless now, it will be christened by one of the employees. The employee who chooses the best name will be awarded $10 in gold. A. H. Herrmann, Richmond, is editor of the magazine, and C. S. Stackpole, also of Richmond, and E. H. Will, of Norfolk, are associate editors. The first number of the publication has sixteen pages. Four thousand copies of it were distributed to the employees.

240,000 Miles Without Accident

Ten employees of the New York State Railways, Rochester, N. Y., lines are now clad in brand new uniforms. It's all because they were careful.

The ten men comprise team No. 15 of the Federal Street division in the annual accident prevention contest of the railway. All trainmen of the Rochester lines were divided into teams of ten men each. To be eligible the ten men on the team must have operated a total of 3,000 days, or an average of 300 days each during the year. The winning team, captained by Theodore Hyde, operated a total of 240,000 miles for the twelve months without a chargeable accident. There were three other teams, one from the Federal Street division and two from State, which operated during the year without an accident, but they did not qualify in operating the required number of days.

Accident prevention contests are part of the safety work being carried on under the direction of Leon R. Brown, safety director of the Rochester lines of the New York State Railways.

Ohio Wreck Laid to Trainmen

Trainmen on the Dayton & Troy Electric Railway were at fault in causing a collision on that road near Dayton, Ohio, on June 25, according to a decision of the Interstate Commerce Commission's safety bureau. In the wreck four persons were killed and 39 were injured. The report also stated that in the opinion of the Commission an adequate block signal system on the line would probably have prevented the accident and that an automatic train stop system would have certainly done so.

To Smoke or Not to Smoke

Over this question the Georgia Power Company, Atlanta, Ga., has aroused a considerable argument. Some weeks ago "Two Bells," its official organ, published an article asking car riders to express an opinion as to whether or not its present "No Smoking" rule should remain in force.

In view of the increasing number of women who smoke, officials were seriously considering a change in the rule. But the referendum, in addition to arousing public interest in the affairs of the company, has brought out the fact that a large majority of the riders are opposed to smoking on the trolley and a still larger number are opposed to allowing women to smoke there! The question whether women should be allowed to smoke has almost made a side issue out of the original question.

Danbury Company Will Sell Certain Franchise Rights

The Danbury Power & Transportation Company, Danbury, Conn., has asked the Public Utilities Commission for approval of its proposed plan to sell its franchise rights for distribution and generation of electricity, and its power plant and equipment to the Danbury & Bethel Gas & Electric Company. The petition states that the seller is to reserve to itself its rights to maintain and operate a transportation system.

Superior Fare Hearing Deferred by Commission

The hearing by the Railroad Commission on the request of the Duluth Street Railway, Duluth, Minn., for higher fares in Superior, Wis., has been postponed to late September. The company contends that the present cash fare of 10 cents or five tickets for 30 cents is insufficient to produce a fair net return.

Opening of Philadelphia Tube Delayed

The North Broad Street subway of Philadelphia, Pa., built by the city at a cost of $100,000,000, will not be placed in operation before next May. This was disclosed recently by officials of the Philadelphia Rapid Transit Company which will operate the line. City engineers, it was said, were in accord with the company's findings contained in an engineering survey that the city-built tube could not be ready for regular train service before the expiration of Mayor Kendrick's term in office. Delay in installing the signal system and other essential equipment and failure to provide adequate terminal facilities for through operation under City Hall before the South Broad Street unit is completed were the factors cited by the Philadelphia Rapid Transit Company experts as contributing to the delay.

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Loud Speaker in London

Two cars of a train on the Charing Cross & Hampstead section of the London Electric Railway have been fitted with loud speakers. One car has a horn under the roof and the other has a double-mouthed rectangular speaker from which the sound emerges in two directions. The guard has a mouthpiece into which he speaks, giving information on the next station, and connections which can be made there. Tests are being made on the same sort of equipment to give communication between guard and driver.

Electric More Economical than Steam in Switzerland

Twenty thousand tons of coal are being saved yearly because of the adoption of electric railway service in Switzerland. Directors of the Rhätian line, which extends for 173 miles and which has been operating for the last five years, have reported other economies. According to their statistics a reduction of 52 per cent is being made in the engineering staff at the workshops for the maintenance of electric locomotives; 48 per cent in the track maintenance department and 43.5 per cent in the service personnel.

Railroad Electrification in Austria

The Austrian State Railroad authorities are planning two new schemes of railroad electrification. The first scheme will occupy a period of five years in completion. It will involve about 380 miles on the Vienna-Salzburg and Vienna-Gratz-Nauer lines. In the second plan a total of about 475 miles will be electrified.

Halfpenny Fares Restored in Glasgow

The halfpenny fare, which was abolished in Glasgow in 1920, was reintroduced last month by the Town Council. This 1-cent charge covers one stage, or half a mile. Heretofore two stages, or about a mile, were obtainable for a halfpenny. The present move is regarded as experimental and has been recommended as such by the general manager, although the adoption of the 2 d. fare for any distance beyond the 1 d. stage has proved very successful, resulting in the increase, it is believed, of £82,196 in the tramway traffic revenue for the financial year ended May 31.

Bus Proprietors Propose Plan to Middlesex

The London Omnibus Proprietors Association has proposed to the Middlesex County Council to institute a system of bus operation. For the last two or three years the Metropolitan Tramways has been operating the Middlesex cars at a loss, due chiefly to bus competition, it is believed. For this reason there seems to be doubt whether the lease, which expires in 1930, will be renewed. According to the secretary, the association would be prepared to participate in a reasonable scheme of compensation by annual tax or donation to the County Council for loss of capital, and it is prepared to cover a system of fares and timings intended for workmen.

Trolleys More Profitable than Buses in Brisbane

Much of system rebuilt since city took it over about four years ago

THE annual report of the Tramways Department of the Brisbane (Australia) City Council gives £178,672 as the net revenue from railway and bus operation for 1926, but after deduction of interest, depreciation and other fixed charges, the deficit was £7,748, compared with a deficit during 1925 of £26,395. The bus operating revenue was £16,750. There was an increase of £61,188 in total revenue during the year. The increase in operating expenses, according to the report, is due to the operation of the 44-hour week for the full year and to additional services to the public.

Since the purchase of the property by the municipality four years ago, 38 miles of new track has been laid, 71 new cars have been built and other improvements have been made. Further extensions to the rolling stock and new shops are recommended. On the bus situation, the report refers to the loss from operation during the year (£5,631) on the eleven buses used, and says that individual operators have a better chance at success, as the drivers will work longer hours. It then proposes that the municipal bus service be abandoned, presumably under conditions by which private buses would be employed in their place in supplementary rather than in competitive service.

Electricity for South Manchurian Railway

The South Manchuria Railway, Shanghai, China, is now planning electrification of a part of its system. This decision follows experiments on the line serving the Fushun collieries, where the electric railway system has been giving more favorable results than steam locomotives.

At Anshan, Manchuria, where the Anzan Iron & Steel Works are situated, electric locomotives have been put in use for carrying ore from the Takushan mine, also with favorable results.

The first section to be electrified will be the Fushun branch line, which joins the main line at Suchiatun Junction. This will be followed by the Suchiatun-Mukden section on the north and by the Suchiatun-Liaoyang section on the south.

After the program mentioned above has been carried out, the shunting engines on the Dairen wharves will be the next to be electrified. Plans have been made to increase the electric power supply at Dairen by 10,000 kw. in order to meet in part the need for service to the electric railways planned.

York Shows Falling Off in Travel

Figures from York Municipal Tramways, England, for the year ended March 31, 1927, show a decrease of 1,000,653 tramway passengers and of 4,681 railless passengers. The municipal buses carried 207,618 more passengers than last year, but the total figures for passengers carried, 8,357,572, was 797,716 less than in the previous year. There was an operating income, after deduction of expenses, but after the charges for interest and sinking fund there was a total deficit of £5,013 from all three services.

Expenses Increase on Belgian Light Railway

According to the report of the Société Nationale des Chemins de fer Vicinaux for 1926, expenses have gone up, due largely to the devalorization of the Belgian franc, while it has been impossible to increase charges as rapidly. The Société Nationale is a large railway system extending through all parts of Belgium, with 4,361 km. (2,739 miles) of track. The gross earnings in 1926 were 157,871,463 francs and the expenses 149,668,993 francs. This gives an operating ratio of more than 94 per cent as compared with 90.68 per cent in 1925. Rates have now been increased, however, the second class passenger rate per kilometer from 0.13 to 0.22 francs and the first class rate from 0.17 to 0.28, with corresponding increases in the freight rates. The system has 649 electric motor passenger cars and 613 trail passenger cars, but the greater part of the property is still operated by steam. The steam equipment includes 836 locomotives and 2,014 trail passenger cars. Thirty-six motor buses have been put in service.

Liverpool Reports Slight Gain in Revenue

The report of the Liverpool Corporation Tramways for the twelve months ended March 31, 1927, gives receipts from passengers as £1,389,150, a gain of £5,189 over last year. The passengers carried were 247,608,127, a gain of 440,119 over 1926. The total revenue of the system for the year was £1,436,805.

After payment of interest, sinking fund requirements and repayment of loan, there was a surplus of £157,443. Wages constituted 46.5 per cent of the total revenue. The 1 penny ticket represented 68.30 per cent of the total number sold. Next comes the 2 penny ticket with 30.03 per cent.

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Recent Bus Developments

Indiana Commission Defines Its Powers on Bus Operation

In an opinion to F. T. Singleton, chairman of the Indiana Public Service Commission, Arthur L. Gilliom, Attorney-General of Indiana, held that the City Council of Indianapolis had no authority to limit the power of the Public Service Commission, concerning the bus law under which the commission grants permits for the operation of bus lines. The question was raised in connection with a motion filed by the Indianapolis Street Railway to dismiss a petition by the Hoosier Transportation Company to take on and discharge passengers within the city limits. The motion of the railway points out that a city ordinance prohibits buses taking on or discharging passengers on streets used by interurban or street cars, unless the buses are operated by the street car or interurban companies. Mr. Gilliom said the commission alone had power to determine who might give service in such streets.

Council Versus Commission in Lincoln

The Lincoln Traction Company, Lincoln, Neb., has run against a snag in securing permission from the City Council to comply with authority received from the State Railway Commission to substitute bus for railway service on its Beach, South Fourteenth and North Tenth Street lines. The Beach line crosses a viaduct three blocks long over the tracks of the Burlington and the Union Pacific Railroads west of the city. The company started buses over this structure before it got the Council's permission. In the division of authority the state commission controls service and rates, while the city governs the use of streets. The Council wants the railway to give bond to replace or repair that portion of the structure used by it. The company asked that nothing be done until the end of the 90-day experimental period, but the Council finally demanded a $6,000 bond before it would permit buses to be operated by the railway, over the structure.

Jitney Operation Sought in Miami

Petitions for the repeal of the ordinance which rules jitney from downtown zones in Miami, Fla., and for the re-enactment of the previous ordinance were presented to the City Commission on Aug. 15. The petitions, containing 6,100 names and 4,200 names respectively, were filed with H. E. Ross, city clerk. Mr. Ross will check the names on the petitions against the list of voters. Under the old ordinance governing jitney operators, special permits and licenses were required as well as proof of the dependability of all drivers and motor vehicles used. Fifteen per cent of all registered voters must sign a petition for a referendum and 10 per cent for an initiative election for the passage of new ordinances.

Further Co-ordination in Westchester County

Leverett S. Miller, president of the New York, Westchester & Boston Railway, proposes to solve the transportation problem of Westchester County northward from White Plains through Brewster, N. Y., and Danbury, Conn., by the establishment of motor coach feeder lines, rather than by the extension of existing railway lines. Mr. Miller's opinion was contained in a communication to L. Ward Prince, president of Prince & Ripley, who had asked, on behalf of Westchester realtors, that the New York, Westchester & Boston extend northward its western division all-electric commuter service now terminating at White Plains. In his letter to Mr. Prince, Mr. Miller said:

You are familiar, I know, with the fact that this company originally contemplated the extension of its lines from White Plains to Brewster and Danbury. Within the last few years the company was faced with the obligation of completing its routes, both from Larchmont to Port Chester, and from White Plains to Brewster and Danbury within the time limit specified by law, or lose its franchise rights.

To accomplish this would have required the expenditure of many millions of dollars. The time did not seem propitious for the extension to Brewster and Danbury, but the extension from Larchmont through Mamaroneck, Harrison and Rye to Port Chester appeared warranted.

It was for this reason that the railway sought remedial legislation to relieve it of the obligation to build to Brewster and Danbury. At present-day prices it would cost to build these latter extensions double the estimate made at the time these lines were first considered.

In the meantime, much of the remaining undeveloped property to the south and east of White Plains has come into the market, and the growth to the north undoubtedly now will increase. But I do not believe that it is yet of sufficient extent to warrant a rail line such as was originally contemplated.

It seems to me that the more practicable solution of the transportation problem for this section is through the use of motor vehicles co-ordinated with the existing rail lines, to be followed later by the extension of the rail lines as soon as the traffic may warrant.

You refer to present-day values of land in this section and the very large increase that would result in values if transit facilities were furnished. Transportation must, to a certain extent, be a pioneer in such development, but it cannot carry the load for too long a period.

As you say, the property owners would be well repaid if they were to underwrite the cost of such an extension, but, as you also remark, they won't; they will expect the transit lines to carry the bag. The development through motor vehicle transportation would require far less investment, and consequently the underwriting by property owners in such an undertaking might be more favorably considered by them.

The working out of these problems requires the co-operation of realtors interested in the development of the section and those connected with the transportation companies. We all have a common interest in the development of the section which it seems cannot be efficiently accomplished without such team work.

Rights for Morris County Traction Company

Joseph P. Tumulty and Joseph K. Choate, receivers for the Morris County Traction Company, have been authorized by the Board of Public Utility Commissioners to substitute buses in place of trolley cars over the lines from Landing, Morris County, to Maplewood, N. J.

It is proposed to use 35 buses. A similar application was granted last year involving the company's line between Elizabeth and Springfield. By the application just granted five routes will be created for the company's buses. The fare will be 10 cents in each zone, the same rate as on the trolleys.

The bus service must be started within a reasonable time, the board ruled, adding that it reserved the right to order the removal of poles, overhead trolley wires and tracks and the replacement of pavements.

At the hearing on the application it was contended that permission to run buses would add value to the property of the company. Such a contention, the board held, was secondary to the question of providing adequate transportation. The decision said:

The board does not propose to approve these permits merely to permit the receivers or bondholders' committee to take advantage of that fact and to speculate with them, but will impose a condition that unless the buses are actually provided and that transportation is furnished over the route now covered by the trolleys the approval will be withdrawn.

Rehearing Sought on Albany Fare Grant

A petition for rehearing was filed with the Public Service Commission on Sept. 2 by Mayor John Boyd Thacher of Albany, N. Y., on the order of the commission adopted on Aug. 4 permitting a 10-cent fare to be charged by the Capitol District Transportation Company, Inc., on its bus lines. This company is a subsidiary of the United Traction Company. The rehearing petition alleges a number of particulars in which it claims the order was not warranted by the evidence taken in the case. It is expected that action on the city's application for rehearing will be taken at an early date. A similar petition has already been filed on behalf of the city of Cohoes.

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Route in Minneapolis Changed

With an order from the Minnesota Railroad and Warehouse Commission to make a 12½-cent token fare for local travel on the Selby-Lake line of the Twin City Motor Bus Company in Minneapolis, Minn., the route is to be changed, according to suggestion of the commission, so as not to be in direct competition with the Selby-Lake interurban railway. A similar fare and rearrangement of bus route had already been ordered for St. Paul and the proposed new bus route had been approved by the City Council. The through fare and local cash fare is 25 cents. The company expects to increase the bus fleet on this line from fourteen to eighteen or nineteen.

The new route is ¼ mile longer in Minneapolis and four blocks longer in St. Paul, which will add about ten minutes to the running time between terminals. The Twin City Motor Bus Company is a subsidiary of the Twin City Rapid Transit Company.

Group or Party Buses in Reading

The Reading Transit Company, Reading, Pa., has in service two buses which are available to groups or parties for trips out of town. These buses of the latest type have a seating capacity for 29 people each. Application can be made to the transportation department for service and rates for trips within a 50-mile radius of Reading.

Wisconsin Patrons for and Against Buses

Sentiment of the people at a public hearing on the proposal of the Wisconsin Public Service Corporation to substitute bus service for the electric interurban service between Green Bay and Duck Creek, Wis., was equally divided for and against such substitution. Action was delayed until further evidence of the sentiment of that section could be obtained.

New Buses Operating in Milwaukee

Two new buses of the very latest type have been received and placed in service on the Lincoln Avenue line of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. These buses are operated by twin engines. Each has a seating capacity of 40 passengers.

Hearing Held on Troy Bus Line

Public Service Commissioner Lunn held a hearing on Sept. 6 on the petition of the Capitol District Transportation Company, Inc., for a certificate of convenience and necessity for the operation of a bus line in the city of Troy, N. Y., which will be an extension of the present bus system of the company and will afford transportation facilities to a section of the city in which the United Traction Company, the parent company, proposes to abandon railway service. A hearing on the proposed abandonment of the trolley route in Fifteenth Street between Hoosick and Congress Streets was held before Commissioner Lunn at the same time as the bus application. There was no opposition to either application at the hearing. The decision of the commission will be announced later.

Buses for Local Service in Detroit

Effective on Oct. 1 the Detroit Municipal Railway, Detroit, Mich., will reduce the street car fare to Redford to 6 cents from 10 cents, making the former amount the prevailing fare throughout the city. Several new bus lines have been decided upon and express street car service will be instituted on Sept. 18 on a main artery in the easterly side of the city. The buses will stop at each block and will carry the loads to the next station at which the express street cars stop. A free transfer from the buses to the street cars will be given. Loading stations for the express cars will be built similar to safety zones, but will have canvas tops and sides. In the opinion of the general manager this may aid materially in reducing the number of accidents resulting from persons being hit while attempting to cross from curb to safety zone.

While the department has been figuring on instituting such service for several months it has not been deemed advisable to attempt high speed on Jefferson Avenue and other lines due to the condition of the tracks. The new roadbed has been completed in Jefferson Avenue and the express service will start there first. Construction gangs are now replacing the roadbed in Woodward Avenue and if the Jefferson project proves successful, the higher speed service will be used on the main artery. Del A. Smith, general manager, said:

The research which the department is conducting in connection with the co-ordination of street cars and motor coaches has convinced us that such a plan is not only entirely feasible, but highly desirable.

Mayor Smith said:

We all know that rapid transit in the form of subways cannot be achieved in Detroit for several years, and for that reason the D.S.R. is making every effort possible to speed up service. The day is past when we figure distance by miles; we figure it now by minutes and if the time required to carry passengers from one point to another can be reduced, the municipal system is benefitting its patrons.

The Street Railway Commission also approved coach service on the Six Mile Road between Woodward and Wyoming Avenues, and extension of the present service on the Seven Mile Road westerly from Wyoming Avenue to Lasher Road. Both these extensions invade territory annexed to the city during the past few years.

The commission also approved coach service on Schoener Road, between State Fair and Gratiot Avenues; and on Connors Avenue between Six Mile Road and Kercheval Avenue. Both lines will go into operation on Sept. 12. This service will be in force only during the morning and evening rush hours, but will be extended as traffic increases.

Buses for Kansas City, Kan.?

Buses of the single-deck type are proposed for operation in Kansas City, Kan., representatives of the Kansas City Public Service Company informed the city commissioners on Aug. 4, in executive session with Mayor McCombs of Kansas City. The buses would serve the districts in the north and west parts of the city that have no adequate transportation facilities. If the plan goes through the buses will be given a six months trial and would be continued if patronage justified the expense, it was reported.

Toledo Bus Ordinance in Abeyance

Enforcement of the new ordinance in Toledo, Ohio, against handling of intracity passengers by interurban buses has been held up through continued postponements in the municipal court of the 40 or more cases that have been initiated against drivers who violated the ordinance. The ordinance has been upheld by the courts of the state. Meanwhile the Community Traction Company has gone ahead with its city bus service for West Toledo, but is suffering from competition of interurban bus lines operating a few miles beyond the city limits.

Coach Service Extended in Wisconsin

Motor coach service, replacing interurbans on runs between Oshkosh and Fond du Lac and Oshkosh and Neenah, Wis., has been placed in effect by the Wisconsin Power & Light Company. Electric railway equipment will be retained, and the track will be used in emergencies or will be restored to regular use if the demands for service appear to justify it.

Ban on Parking Buses Lifted Partly

The peremptory order to interurban bus companies using the streets of New York City as terminals to find stations not on the public thoroughfares has been modified by Police Commissioner Warren, who extended the time limit indefinitely from Aug. 1 for lines which are building terminals but have been unable to complete them. With the opening of the Holland Vehicular Tunnel the commissioner believes there will be a great increase in interurban bus lines. Lines which have made no attempt to obtain terminals will receive summonses for obstructing traffic. Sept. 15 is the new date fixed in the ban against parking.

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Financial and Corporate

Commission Hears St. Louis Reorganization Plea

The Missouri State Public Service Commission has under advisement the application of the St. Louis Public Service Company for approval of its plans for the reorganization of the United Railways properties in St. Louis, Mo. The new company recently purchased the United Railways holdings for $49,601,000.

United States District Judge Faris, who has jurisdiction over the receivership, has already approved the general plan of reorganization. The company is expected to emerge from receivership within 60 days.

The commission conducted a hearing on the application on Sept. 2. At this session it developed the new company plans to issue securities in addition to the $52,414,862 heretofore provided for, but specific plans for the additional financial obligations were not revealed at the hearing.

The commission also sought definite information concerning the cost of reorganizing the properties, but Stanley Clarke, counsel for the reorganization committee, stated that there is no way of finally estimating such cost at present. The expenses of the reorganization to date have totaled approximately $895,000, but that amount will be increased before the complete reorganization is perfected.

During the period of reorganization the committee has maintained offices in the Liberty Central Trust Building, St. Louis, and has employed a force consisting of three attorneys, two engineers, a secretary, stenographers and other office help. This force has taken no part in the operation of the company under the receivership, which has been in charge of Rolla Wells and Col. Albert T. Perkins, his general manager.

Counselor Muench for the city took the position that the application of the new company was premature and too indefinite and that under it the commission could only issue an "If and when order." He cross-examined all witnesses for the company.

Walter E. Bradley, secretary of the reorganization committee, testified that the majority of the holders of securities of the old company had approved the reorganization plan. He estimated the percentage of assent as follows: Transit company securities, 99.76 per cent; Suburban company bondholders, 87 per cent; United Railways preferred stock, 96 per cent, and United Railways common stock, 89 per cent. All classes of security holders will participate in the readjustment of the company's financial structure and none of the securities to be issued by the new company will be sold to the general public. He said that all of the stock of the new company has been subscribed by the present security holders.

The new stock will include 73,193 shares of preferred and 342,645 shares of common. Of the preferred stock 19,000 shares will be used to pay off unsecured claims against the old company on the basis of 66⅔ per cent if such stock is accepted in payment. If not, the claims will be paid off on the basis of 33⅓ per cent in cash. Mr. Bradley said that with the exception of the city of St. Louis, all of the unsecured claim holders have elected to accept stock in payment. Such claims total $466,471. The testimony developed that no funds have been set aside to take care of the mill tax judgment.

The new company will have total bonds of only $40,800,000 as against $54,890,000 of bonded indebtedness of the United Railways. New bonds to the amount of $4,500,000 will be issued at this time to refund a like amount of Suburban company bonds. Mr. Clarke testified that the cash in the hands of Receiver Wells would not reach the estimate of $4,500,000 made when the committee first announced its reorganization plans in October, 1924. The total amount of cash now in the hands of Receiver Wells was not revealed at the hearing, and it was stated the probable deficit in cash for the reorganization could not be definitely estimated at present. Mr. Clarke said:

We probably will have to ask the commission for authority to sell additional preferred stock or prior preferred stock, or some short term notes to make up the deficit in the cash requirements of the plan.

A shrinkage of earnings during the last three years accounts for the lower amount of cash held by the receiver.

Later it was estimated the company would require at least another $900,000 in addition to the cash now available.

The total securities of the new company including bonds and stocks will be $52,414,862 compared with $93,886,000 in securities of the old company now outstanding. The $16,383,000 in preferred stock and $24,913,000 common stock of the United Railways were eliminated in the reorganization plan.

New Owners in Beacon

The Fishkill Electric Railway, controlled by the Central Hudson Gas & Electric Corporation, has relinquished the Beacon, N. Y., railway system to a local syndicate headed by Attorney James G. Meyer and Mayor Macomber. The line covers 7 miles. The fare is 7 cents with no transfers. It is stated that the operating company might find the burden of Main Street paving somewhat burdensome and complications might develop affecting adversely the future of the trolley.

Traffic, Fare and Wage Figures

Traffic on the electric railways continued to fall off during July, compared with July, 1926. The decrease was the heaviest of any month in 1927 thus far. The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 219 companies for July, 1927, compared with July, 1926, is as follows:

July, 1927	773,232,934
July, 1926	803,981,889
Decrease, per cent	3.83

Average cash fares in cities of 25,000 population and over:

	Cents
Aug. 1, 1927	7.9223
July 1, 1927	7.8966
Aug. 1, 1926	7.6946

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate Cents	Index Number 1913-100 Per Cent
Aug. 1, 1927	57.23	210.02
July 1, 1927	57.19	209.87
Aug. 1, 1926	56.87	208.70

Dispute Over Applicability of Funds for Income Bond Payment

Thomas B. Jenkins, of Richmond, Ind., owner of $35,000 par value adjustment mortgage 5 per cent income bonds of the Third Avenue Railway, New York City, is bringing suit in federal court to compel it to pay full 5 per cent interest and 27½ per cent accumulated back interest and to prevent it from going into the bus business until the bonds are paying full interest and the accumulation is wiped out. Suit will be brought on behalf of himself and all other bondholders, but Mr. Jenkins has already filed a suit in state court, asking that the company be compelled to pay interest due on his bonds. In urging others to join him Mr. Jenkins issued this appeal:

On Oct. 1, 1927, a total of 30¾ per cent interest will be due on the adjustment mortgage 5s, amounting to $6,836,000. Of this accrued interest 1¾ per cent, or $275,000, has been ordered paid, leaving an arrearage of $6,561,000, or 29¾ per cent.

According to the company's published reports, full interest of 5 per cent has been earned on the adjustment 5s in the past two fiscal years, with a surplus, after interest, of around $300,000. Only 2½ per cent has been paid or ordered paid in each of these two years.

According to the same reports, the surplus income of the company available for the payment of interest on these bonds accumulated since 1917, but unpaid, is approximately $4,500,000, or 20 per cent on the outstanding bonds.

The company has been operating bus lines in Westchester County and, not only are said bus lines operating unprofitably, but they were financed out of the company's treasury with funds which legally belong and should have been paid to the adjustment bondholders. Officers of the company admit that they contemplate an extensive bus venture in the Bronx, requir-

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ing considerable further capital. This venture, they also admit, will probably prove unprofitable. The financing of this venture, they state, is to be accomplished through the hypothecation of securities now held in the company's treasury, which were bought with cash from the company's treasury, and which I am advised by counsel ought to be applied to the interest due the adjustment bondholders.

As an owner of the adjustment mortgage bonds, I have employed counsel to estop the company from using the property of these bondholders for capital purposes, in direct violation of the trust indenture securing the bonds, and also to bring legal action against the company, to force it to pay the earned but withheld interest on the bonds.

My attorneys are Barber, Fackenthal & Giddings, 120 Broadway, and I hereby invite all owners of these bonds to join with me in an association for mutual protection.

No deposit of bonds will be required. Please communicate with me in care of my said attorneys or with said attorneys. Telephone—Rector 4573.

A statement by the company says:

The past year has been an eventful one for the companies of the Third Avenue Railway System. Much of the uncertainty as to the future, occasioned by threatened bus competition has been cleared up and the future never seemed more assured or brighter.

Operations for the year ending June 30, 1927, showed approximately $250,000 above 5 per cent on the adjustment bonds. This showing was abnormal in the respect that there was a substantial increase in receipts and in net due to the Interborough strike which occurred during that year, temporarily diverting travel to the Third Avenue lines.

It has been necessary in order to avoid the sale of securities at a sacrifice to finance all the operations of the companies for the last ten years out of surplus.

During the past year among other extra disbursements approximately $300,000 was paid on account of paving bills of previous years which has been in litigation and also it was necessary to pay $350,000 on account of capital expenditures, making approximately $650,000 paid out of the year's surplus for expenditures not chargeable to operating expenses.

At the present time the companies of the system have in the treasury available for all purposes approximately $1,500,000. This is outside of its own securities which were bought and placed in its treasury more than ten years ago.

From this it will be seen that although the future of the companies of the system seems assured, the cash available for all purposes has not been increased during the past year. Under the conservative policy which has characterized the management, it is advisable to conserve this cash surplus. This is more urgent by reason of the increase of wages that has been going into effect during the past few months.

Traffic Increase in Toronto

Transportation Commission's report covering operation of municipally-owned system sees improvement in general business reflected in the operations for the year 1926

IN ITS fifth annual statement covering the operations of the year ended Dec. 31, 1926, the Toronto Transportation Commission, Toronto, Ont., points out that the surplus of $76,951 was slightly more than one-half of one per cent of the gross revenue. The accumulated surplus as of Dec. 31, 1926, was $248,371.

The gross income was $12,050,304, an average of more than $1,000,000 a month and the largest in the history of the commission. The increase over 1925 was partly due to the increased development of motor coach traffic and partly to an improvement in general business conditions in the Toronto district. The revenue passengers were 183,494,076, a gain of 2,714,151 over 1925, but the total number carried for 1926 was still more than 5,500,000 passengers below the record established in 1923.

The investment in capital account, as of Dec. 31, 1926, was $45,350,484. Capital expenditure in road and equipment totals $39,374,813 as of Dec. 31, 1926. The net additions to the property accounts during the year were slightly more than $600,000, all of which were financed by the commission without increasing the debenture debt and without disturbing the invested capital funds held in trust for the commission by the City Treasurer.

The amount carried on the books classified as "Franchise and Other Intangible Assets" now stands at $4,375,449 as of Dec. 31, 1926. This item has been referred to at length in reports of previous years. The amount represents payments the city has been forced to make for the property of the Toronto Railway in excess of any reasonable valuation and for franchises and rights of certain radial railways which previously operated within the city limits. In line with the policy adopted by the commission in 1925, this large item is being amortized as rapidly as conditions will permit.

The commission in 1925 applied $941,941 of the accumulated reserves toward the reduction of the intangible assets. In view of the small additions to the capital accounts and the fact that no large replacements will be necessary in the near future, it was possible to make a further reduction of these assets and an additional amount of $834,844 was therefore applied to this purpose in 1926. During the last two years the intangible assets have been reduced by $1,776,785.

The reserve for replacements, as of Dec. 31, 1926, amounts to $2,811,412. In the revenue accounts for 1926 there has been appropriated from net income the sum of $998,911 for the purposes of this reserve. The net funded debt less funds transferred to the City Treasurer for redemption of debentures is $39,640,679 as of Dec. 31, 1926, a reduction of more than $1,000,000 from the position at the close of the year 1925.

The operation of motor coaches, which was commenced in May, 1925, has been greatly extended during the past year. A total of $132,008 was obtained from this source in 1925. In 1926 the gross income was $300,811. There has been a surplus each year from the operation of motor coaches.

Various classes of service which were operated in 1925 were continued in 1926, including sight-seeing trips, the chartering of motor coaches to private parties, coach transportation to the race tracks and to the Canadian National Exhibition, transportation of school children, and a regular scheduled service to the "Hill" district. In addition, there was inaugurated in July a regular service between Toronto and Niagara Falls. All of these services, which are operated as a separate undertaking and distinct from the street railway and bus transportation, have proved to be very popular, although the rates charged are in all cases necessarily in excess of the rates charged on the street railway. As many as 49 coaches have been chartered in a single rental contract.

Operating expenses of the commission for the year 1926, including the cost of electric current, maintenance, repairs, administration and taxes, but exclusive of the operation of motor coaches, amounted to $7,297,367. This total compares with $7,292,298 in 1925.

The Transportation Commission purchases all the power for operation of the railway from the Toronto Hydro-Electric System, which in turn purchases from the Hydro-Electric Power Commission of Ontario. The average cost of power to the Transportation Commission, converted and delivered as direct current was 1.40 cents per kilowatt hour in 1926. The aggregate amount paid for purchased power was $1,077,277.

Annual charges for interest and sinking fund on the debenture debt increased in 1926 approximately $125,000 over the requirements of the year 1925. In addition, it was necessary to appropriate a large amount for the replacement reserve. The large annual increases in the debt charges, which have been referred to in previous reports, will not continue beyond 1926 unless the commission is obliged to increase the debenture debt. A policy to which the commission has consistently adhered since the commencement of operation is that extensions or additions to the system should not be made unless they will earn sufficient additional revenue within a reasonable period to meet all the expenses of operation and fixed charges on the new capital. If extensions are made without regard to economic considerations, the fare will inevitably have to be increased.

The expenses of operation of motor coaches totaled $211,548, resulting in a net income of $89,262, which was more than sufficient to meet all fixed charges on the capital invested including an adequate allowance for depreciation.

The mileage operated by street cars and buses, but not including motor coaches, aggregated 25,533,893 miles in 1926, an increase over the mileage in 1925 of 286,835.

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COMPARATIVE OPERATING STATEMENTS OF THE TORONTO TRANSPORTATION COMMISSION

Gross Income	
1921*	$4,071,969
1922	11,651,512
1923	11,852,334
1924	11,709,695
1925	11,626,658
1926	12,050,304
Operating Expenditures	
1921*	$2,499,773
1922	8,468,841
1923	8,104,680
1924	7,788,563
1924	7,387,570
1926	7,508,915
Net Income	
1921*	$1,572,196
1922	3,182,670
1923	3,747,654
1924	3,921,131
1925	4,239,087
1926	4,541,388
Interest and Redemption of Debt	
1921*	$642,805
1922	1,837,977
1923	2,387,725
1924	2,733,385
1925	3,081,703
1926	3,273,045

* Four months.

The largest adjustment in the surplus account during the year was the transfer of $193,638 to the reserve for replacements. The report states that if sound business principles are to be followed, it is imperative to create proper reserves and to amortize the relatively large amount of intangible assets before accumulating any substantial surplus.

During the year 1926 the average fare collected on the Toronto Transportation System was 6.16 cents. Its distribution was as follows:

	Cents per Passenger	Per Cent of Cost
Maintenance of track work, overhead and structures	0.366	5.93
Maintenance of equipment	0.506	8.21
Power	0.653	10.58
Operation of cars and buses	2.139	34.72
Tickets and transfers	0.040	0.65
Insurance	0.030	0.48
Taxes, legal and miscellaneous expenses	0.091	1.50
General offices and accounting	0.137	2.23
Interest on and redemption of capital and replacements	2.200	35.70
Totals	6.162	100.00

Revenue from sundry other sources, amounting to 0.217 cents per passenger, provides the additional amount required to make up the full allowance necessary for replacements and other operating reserves.

Track extensions built in 1926 were 1.561 miles and track removed in 1926 was 0.713 mile. This made a net addition to trackage in Toronto during 1926 of 1.388 miles.

No new large buildings were constructed during the year. The most important work carried out was an alteration of the paint shop at the Hillcrest property so that a modern and economical system of spray painting could be installed. During the year the last of the three storage batteries which the city was obliged to purchase from the Toronto Railway became useless and the Commission disposed of the equipment at scrap values.

The commission owns 972 passenger street cars, 82 electric service cars, 122 buses and coaches, and 39 motor trucks. All of this equipment is maintained in good operating condition and is used in regular service. The reconstruction work on the cars originally acquired from the Toronto Railway was completed during the year. On Dec. 31 1925, there were 98 pay-as-you-enter cars still remaining to be rebuilt. Of these 32 were converted into pay-as-you-leave cars, and 66 were converted for two-car train operation. Nine additional motor coach bodies were built at the Hillcrest Shops in 1926.

The commission continued operation of the street railways in the Township of York and Town of Weston during the year under the special operating agreements which have been referred to in previous reports. These agreements impose no financial obligations on the Commission.

In concluding his statement General Manager Harvey said that the outstanding feature in connection with the operation for the year 1926 was the improvement in traffic, which was most encouraging after the decrease in passenger revenue experienced in 1924 and 1925. The fundamental need of the system was more business. Without increased revenue it was impossible to justify further extensions.

It was his opinion that proper coordination of the transportation services of any large city to provide adequate and convenient facilities should include regular and reliable service to important centers outside. At the present time several million passengers per year were transported into and out of Toronto by interurban buses. He said the report of the Motor Bus and Truck Committee of the Canadian Electric Railway Association, adopted by the association in 1927, very definitely stated the situation as follows:

It is becoming more and more apparent that the operation of automotive vehicles by the transportation agency of any given area should not be confined strictly to the geographical boundaries of such area. For the street railway system of a city to sit meekly by while others pre-empt all profitable interurban or suburban routes under conditions amounting in practice to perpetual franchises on such routes, spells disaster in the long run to any such system. It involves a constantly increasing loss of local fares to such through-running buses, the creation of a net-work of outside franchises stifling and forbidding the normal growth and development of the local system, the occupancy by others of a field logically belonging to such system and necessary to the economical development of its urban services, and a substantial and pronounced loss of prestige and local favor.

In the report appears this statement:

One of the most difficult conditions your commission has to meet is the constant demand for extension of its rail lines and bus services into localities from which practically no additional revenue can be derived. While your commission recognizes its obligations as a publicly owned utility to provide city-wide service, yet it must have regard for fundamental economic considerations if the present rates of fare are to be maintained. The revenue from the universal fare system has varied only slightly from year to year. The problem of administering the system would be greatly simplified if there were a moderate and consistent yearly increase in revenue.

COMPARATIVE STATISTICS ON REVENUE PASSENGERS OF TORONTO TRANSPORTATION COMMISSION

(City Fare System)

Year	
1921*	61,870,213
1922	187,145,261
1923	189,143,145
1924	185,203,698
1925	180,779,925
1926	183,494,076

* Four months.

Month	1925	1926
January	16,314,899	15,687,830
February	15,065,782	15,067,733
March	16,020,330	16,487,826
April	14,904,316	15,177,829
May	14,922,004	15,224,681
June	14,367,817	14,588,118
July	13,441,204	13,930,141
August	13,643,436	13,976,569
September	15,410,594	15,616,925
October	15,393,333	15,423,929
November	15,133,421	15,504,898
December	16,162,789	16,807,597
Totals	180,779,925	183,494,076

COMPARATIVE STATEMENT OF EARNINGS OF TORONTO TRANSPORTATION COMMISSION

	1925	1926
Income:		
Passenger earnings:		
Railway and bus transportation	$11,157,893	$11,362,690
Motor coach transportation	132,008	300,811
Income from sundry other sources	336,757	386,802
Gross income	$11,626,658	$12,050,304
Expenditure:		
Cost of electric current, including operation and maintenance of substations	$1,108,942	$1,173,581
Expenses of operation, maintenance, repairs, administration and taxes, including accrued charges	6,183,356	6,123,786
Expenses of operation—motor coaches	95,271	211,548
Total expenditure	$7,387,570	$7,508,915
Net income available for fixed charges	$4,239,087	$4,541,388
Fixed Charges:		
Interest	$2,207,819	$2,233,494
Reserves on capital account:		
Redemption of debenture debt	873,883	1,039,550
Reserve for replacements	909,352	998,911
Reserves on operating account:		
Reserve for workmen's compensation and public liability	126,968	132,480
Reserve for contingencies	50,000	60,000
Reserve for doubtful debts	13,000	.....
Total fixed charges and reserves	$4,181,024	$4,464,437
Net income carried to surplus	$58,063	$76,951

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Book Reviews

History of the Incandescent Lamp

By John W. Howell and Henry Schroeder. The Maqua Company, Schenectady, N. Y. 208 pages.

So that the present generation may have some idea of the design, manufacture and development of the lamp business this history has been written with numerous illustrations to portray the changes in this industry. Something of the romantic era of electric lighting prior to Edison's invention is described so that the reader is in a receptive frame of mind for the introduction of the battery, the ampere and dynamo. The authors in the preface pay tribute to Thomas A. Edison, whose incandescent electric lamp "is the foundation stone upon which the electric light and power industry of today has been built."

Year Book on Commercial Arbitration in the United States, 1927

Prepared by the American Arbitration Association, 342 Madison Avenue, New York City. Published, 1927, by Oxford University Press, American Branch, 35 West 32d Street, New York City. Cloth, 6x9½ in., 1,152 pages. Price $7.75, postpaid.

This is the first of a series of standard publications on arbitration being prepared under the direction of the Research and Publications Bureau of the American Arbitration Association. The association is a voluntary educational organization, supported by dues and contributions. It serves business through the promotion of arbitration to eliminate the notorious delay, expense and bad after effects of litigation. It acts as an educational body, as an agency to assist other bodies in setting up effective machinery for arbitration and as a practical tribunal where members and friends of arbitration may arbitrate their disputes speedily, justly and at negligible cost.

The body of the book is a complete outline of the existing arbitration arrangements in practically every important industry. Each industry is treated separately with details of the arbitration procedures now in use by its various societies and trade associations. This treatment by industries is followed by a description of the arbitration rules of the U. S. Chamber of Commerce, the International Chamber of Commerce and local chambers all over the United States.

With the aid of name and subject indexes the busy executive can quickly locate those sections relating to arbitration as it exists today in his particular industry or field of work. He will find specific data, names and addresses of organizations, forms and rules of procedure with which he can easily chart a practical course of action. If this book leads to a more general understanding and acceptance of the economies of commercial arbitration it will help eliminate one of the most glaring wastes in modern industry.

Business Cycles and Business Measurements

By Carl Snyder. New York, N. Y.: The Macmillan Company. 326 pages. Price, $6.

The striking variations in the fluctuations of trade, from prosperity to crises and depression which we have come to call "business cycles," have had in the United States a greater intensity and, therefore, arouse deeper interest than in perhaps any other country, and many attempts have been made to determine definitely the extent and regularity of this movement. But it is only in recent years, and largely following the great burst of interest aroused during the war, that the material has been available to make such definite measures. In this book the author has sought to put together this wealth of new material and from it derive measures of business from month to month, one of which is a wide composite of a weighted average of 56 independently computed series

Others have been found in close agreement with this broad combination, and building upon these foundations and the relationships therein established it has been possible to carry back several measures of trade through more than half a century. These measures seem to show that the crises associated with the business cycle reached their intensity in the latter part of the nineteenth century, and has since been of distinctly lessened severity. But the course of these fluctuations is of wide import and it is of deep interest to the business man, especially, to know just what is the current position of industries and trade with reference to that persistent and never-ending growth. These new measures of trade and productive activity are set forth graphically in a series of more than 40 full-page charts.

Wages in the United States, 1914-1926

New York, N. Y.: National Industrial Conference Board. Price $2.50.

The new volume on wages affords a comprehensive picture of wage conditions and movements in all important occupational fields. Particular attention has been given in the present study to the relation of the wage situation during 1926 to business and industrial conditions during that year. The very pronounced stability and relatively high level of wages during the past three years in the face of declining prices is dealt with as one phase of present conditions especially worthy of study. A novel note is struck by the report in the declaration that the contents of the wage earner's envelope in many instances no longer represent his sole income. Bonuses based on production, quality of work, on attendance, promptness or long service; profit sharing, employee stock ownership, pensions, health, accident and group insurance and, in some cases, unemployment insurance, co-operative purchasing plans, industrial housing and transportation at less than commercial rates are some of the benefits cited as examples of supplements to wage incomes. This new study of the Conference Board covers wages in agriculture, in the public utilities, in the building trades and on the railroads, as well as wages in 25 important manufacturing industries. The text is well fortified with many tables and charts covering the period 1914 to 1926, inclusive.

Directory of Commercial Testing and College Research Laboratories

Bureau of Standards, Department of Commerce, Washington, D. C. 39 pages. Price, 15 cents.

In recognition of the desirability under present conditions of independent commercial testing service, and in anticipation of the marked increase in the demand for such service in both domestic and export trade, there has been compiled by the National Bureau of Standards a list of laboratories throughout the country that are prepared to test various kinds of commodities, to determine whether or not they can apply to its customer's purchase specifications. In accordance with the law, the National Bureau of Standards makes tests and carries out investigations for other government departments. It is impracticable for the bureau to make tests for private individuals if other laboratories can do the work. To inform interested persons of the location of other laboratories the bureau has compiled a list of 207 commercial testing laboratories throughout the country, together with indications of the types of commodities which they are prepared to test. To accompany the list of commercial testing laboratories there has been compiled a list of 143 colleges which are used not only for the purposes of instruction but also to a considerable extent for research work.

For the purpose of minimizing the disadvantages incident to the use of specifications, the bureau has started a so-called "Certification Plan," in accordance with which there is compiled a list of manufacturers who have expressed their desire to supply material complying with certain selected nationally recognized specifications and willing to certify to the purchasers upon request that the material thus supplied is guaranteed to meet the requirements and tests of specifications. This plan has already been applied to 48 United States government master specifications. Copies of any of the 48 lists of manufacturers, to which additions are being made from time to time, can be obtained upon request.

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Personal Items

J. H. Lucas Heads Transportation Section

General superintendent of rolling stock at Milwaukee honored by the Wisconsin Utilities Association

J. H. LUCAS, elected chairman of the transportation section of the Wisconsin Utilities Association at its convention in August, is just completing his twentieth year in the car building and maintenance industry. He has spent half of that time with the Pullman Company and the last ten years with the Milwaukee Electric Railway & Light Company. At present he is general superintendent of rolling stock at Milwaukee.

J. H. Lucas

When Mr. Lucas, fresh from high school, entered the Pullman company's shops as a template maker apprentice, all cars were made of wood. Among the company's products were many cars for elevated and subway operation, to say nothing about the cars for steam railroad service.

Among important developments at Milwaukee since Mr. Lucas has been there are the placing in service of the three-truck, articulated train and the double-truck one-man or two-man safety car which succeeded the single-truck safety cars of 1917 and 1918. The larger car, about 45 ft. in length, designed and built in Milwaukee, was put in service in March, 1920. About five years ago a five-year program of rehabilitation of interurban equipment was begun by the Milwaukee Company and since 1919 the rolling stock department has been called upon to meet the problems incident to the operation of buses and those that have arisen in connection with the operation of garages.

As superintendent of rolling stock, Mr. Lucas has developed a very complete system of inspection service and has charge of a shop layout which probably has more modern mechanical equipment and labor-saving devices than any other shops of similar size in the country. His department looks after 800 local cars, 100 interurban cars, 150 buses and 400 other vehicles including work cars, trucks and automobiles.

The outlook of Mr. Lucas with respect to the present and the future design of both cars and buses was perhaps reflected best in the paper which he presented before the transportation section of the Wisconsin Association at the recent meeting in Milwaukee and reprinted in ELECTRIC RAILWAY JOURNAL for Sept. 3, page 391.

Changes Made on Indiana Property

The Indiana Service Corporation, Fort Wayne, Ind., announces the appointment of M. M. Herrell as traffic agent with headquarters at Logansport. Mr. Herrell will represent the traffic department in all matters pertaining to freight and passenger business in Peru, Logansport, Delphi, LaFayette and intermediate towns. He was passenger and freight agent at Wabash for several years. This appointment was made necessary by the increase of business in the towns mentioned and by the desire to have a thoroughly trained traffic man available for patrons at all times.

Marvin Erb, passenger agent at Peru, has been promoted to passenger and freight agent at Wabash to take Mr. Herrell's place.

W. F. See, who was Mr. Erb's assistant at Peru, has been appointed passenger agent at Peru.

Market Street Men Receive Promotions

Five appointments of general interest have been announced by Samuel Kahn, executive vice-president of the Market Street Railway, San Francisco, Cal.

J. W. Delaney has been named superintendent of equipment and his assistant will be C. D. Miller. Both of these men received training in the company's shops under J. M. Yount, who has been elected to the office of vice-president in charge of equipment and maintenance, a new position created to provide technical administration of shops, tracks, cables, overhead lines and substations. Mr. Yount has served as superintendent of equipment of the company since 1910. Mr. Delaney has been assistant to Mr. Yount since 1924 and Mr. Miller has served as inspector of equipment since 1919.

E. H. Lincoln is the new superintendent of the Geneva division. He has occupied a similar post at the McAllister division since 1924. The post vacated by Mr. Lincoln will be filled by P. O'Marie, who for six years has been superintendent of ferry terminals.

T. B. Gavin Auditor at Dayton

Man of wide experience in accounting practices named to interurban recently reorganized

T. B. GAVIN is auditing the books and accounts of the recently rehabilitated Cincinnati, Hamilton & Dayton Railway, Dayton, to which he brings a somewhat varied experience in general accounting work. It was while representing Arthur Young & Company on an audit of the accounts of the Dayton property that he attracted the attention of the officials of that line who later appointed him auditor.

T. B. Gavin

In his early youth at Chicago Mr. Gavin was affiliated with the Stock Yards Company and the Chicago Junction Railway, the former handling all the livestock that went to the Chicago market and the latter transporting the stock in its last interline movement. The accounting for this entire group of interests was handled in one office and was directed by the famous railroad accountant, Charles C. Chace. From the lowly post of voucher clerk in this organization of more than 100 persons to that of assistant to the comptroller he advanced all in the space of four years. He was also appointed auditor of the Electric Light & Power Company, which was a member of this group of interests.

His advancement was accelerated by his night school attendance and graduation from Business College, and his attendance at the LaSalle Extension University, where he took up higher accounting and business management. The knowledge thus gained was soon reflected in his work, and when the war came he was placed in charge of the task of preparing the consolidated income tax return of the allied interests. About that time the railroads were taken over by the government and Mr. Gavin was given the job of directing the accounting of corporate interests of the Chicago Junction Railway and also those of the Chicago River & Indiana Railway. After the war he was appointed income tax auditor for the Revenue Department but preferred to enter the public accounting field.

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Later he entered the manufacturing field as auditor of the Illinois Tool Works, Chicago, maker of high-speed tools for the automotive industry

Nor does this enumerate the many contacts which Mr. Gavin made before his signing with the Dayton railway property. He became general manager of a large manufacturing house and still later installed a general accounting system in Mandel Brothers, accomplishing this work with the co-operation of the then comptroller, John F. Ruffner, now assistant to the president of the "Fair," Chicago, America's foremost exponent of the retail system of inventory and authority on department store accounting.

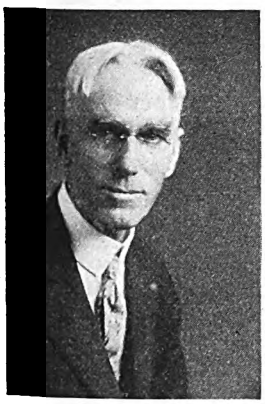
Mr. Gavin was born in Ottawa, Ill., where he received his early education.

Department Heads in Oakland Are Made Vice-Presidents

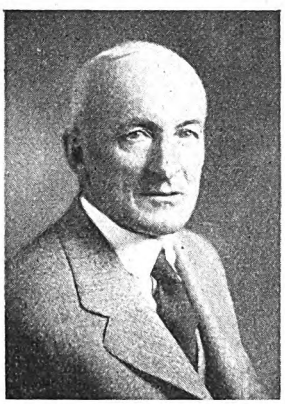
Careers are reviewed of men recently advanced to executive posts by Key System Transit—Each man a specialist of wide experience

FURTHER reorganization of the forces of the Key System Transit Company, Oakland, Cal., was made recently at a special meeting of the board of directors. Four departments were created, each headed by a vice-president, to constitute, with Alfred J. Lundberg, president, the operating force of the company.

The new vice-presidents are: James P. Potter, in charge of operation; H. P. Bell, in charge of engineering; C. C. Vargas, in charge of finance; and Paul Goldsmith, in charge of public relations. Each of these four men formerly bore the title of manager of his department, but they were elevated to the rank of vice-president in accordance with the new president's plan of coordination.



Paul Goldsmith



James P. Potter

C. C. Vargas

C. O. G. Miller remains as chairman of the board of directors and Lester S. Ready, recently resigned as president, is vice-chairman.

J. P. Potter, for many years superintendent of transportation, is now head of the operating department. He will have charge of ferry, bus, car and train operation. He is one of the oldest officials in point of service in the Key System and is one of the best known railway executives in the country.

C. C. Vargas, head of the financial department, is one of the youngest Key executives. He was formerly assistant to C. O. G. Miller when the latter was president. Mr. Vargas, under the new arrangement, will have supervision of all financial matters, including auditing, accounting and purchasing. He entered the service of the Key System in July, 1912, as payroll extension clerk in the auditing department, at a salary of $35 a month. After occupying various positions, he resigned as chief clerk in that department in July, 1918, to become auditor with the capital issues committee in Washington, D. C. When this committee dissolved in December, 1918, Mr. Vargas was made disbursing officer for the War Risk Insurance. There he remained until July, 1920. He then returned to California as auditor for the Mercantile Trust Company. In January, 1922, he reentered the service of the Key System as comptroller, being made assistant to the president on March 16, 1925, in addition to retaining his duties as comptroller. Mr. Vargas was born on Dec. 25, 1892, in Lemoore, Kings County, Cal. He attended grammar and high schools in Nevada. Returning to California, he entered the University of California night school and took courses in accounting and in finance.

Paul Goldsmith, manager of public relations and advertising, is a former Oakland newspaper man. Since he has been in office there has been an era of better feeling between the newspapers and the railway than existed in the past.

FRANK BENNETT, senior supervising inspector of transit for the Board of Transportation of New York, has retired on a pension under the retirement plan in effect for city employees. His associates in the city service honored him recently at a dinner attended by more than 100 of his fellow workers. Mr. Bennett, was the first dispatcher and trainmaster in charge of the electric operation of the southern division of the old Brooklyn Rapid Transit system. He had taken up railroading when he left City College and had been brakeman, towerman and dispatcher on the Delaware, Lackawanna & Western, the Sante Fe and the Union Pacific before he joined the company in Brooklyn. He entered the service of the original Public Service Commission in 1907 as a transit inspector.

OBITUARY

Hugh McCloskey

Notable among the achievements of Hugh McCloskey, beloved citizen of New Orleans, La., who died recently, was the rehabilitation of the New Orleans Railway & Light Company. When in the early years of the present century the transportation system in that city had reached its low point he was urged to come to the rescue, accept its presidency and put it on its feet.

Mr. McCloskey's active connection with the affairs of the New Orleans Railway & Light Company and the American Cities Company, by which the New Orleans Railway & Light Company was controlled, dates from March, 1908, when he was elected chairman of the board of directors of the latter company. Later he was elected president and the position of chairman of the board was abolished. Following the completion of the construction program which he laid down for the company in New Orleans, Mr. McCloskey relinquished the office of president and again became chairman of the board and in addition president of the American Cities Company. He relinquished these posts in 1915.

Among the improvement projects effected during his administration was the placing of the Carrollton Avenue and City Park Driveway tracks in neutral ground so as not to interfere with the street paving, and the authorization of the construction of a new line out to St. James Avenue to Milneburg. Under his administration Spanish Fort was purchased and converted into a pleasure resort, the railway being built to that point. The company stood half the expenses with the New Orleans Land Company in building a driveway to Spanish Fort.

In the midst of his utility activity is another story of his financial, business and social interests. Some years ago Mr. McCloskey received the New Orleans *Picayune's* loving cup for his public-spirited efforts in giving the city its wharves and sheds.

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Manufactures *and the* Markets

Exhibit Committee Asks Co-operation in Bus Exhibit Placing

Because expense may be incurred to bus and truck exhibitors if they do not deliver their exhibts at the Cleveland Auditorium in time, a special bulletin was mailed on Sept. 3 by Fred C. J. Dell, director of exhibits, urging that all parties concerned adhere strictly to the appended schedule:

SCHEDULE COVERING ARRIVAL OF ALL AUTOMOTIVE VEHICLES TO BE SHOWN AT THE 46th ANNUAL CONVENTION OF THE AMERICAN ELECTRIC RAILWAY ASSOCIATION

Exhibitor's Firm Name	Space Numbers	Buses, Chassis and Trucks to Arrive
American Car & Foundry Motors Company	620 to 625, inc.	Sept. 29 bet. 9 a.m. and 12 noon
Baker-Raulang	667 and 668	Sept. 28 bet. 9 a.m. and 12 noon
Bender Body Company	669–670–671–672–673	Sept. 28 bet. 9 a.m. and 12 noon
Commercial Shearing & Stamping Company	664	Sept. 29 bet. 1 p.m. and 5 p.m
Fitzjohn Manufacturing Company	406 and ½ of 405	Sept. 28 bet. 1 p.m. and 5 p.m.
Fremont Metal Body Company	452 and 454	Sept. 28 bet. 9 a.m. and 12 noon
Graham Brothers	665 and 666	Sept. 28 bet. 1 p.m. and 5 p.m.
Gramm Motors	663	Sept. 29 bet. 1 p.m. and 5 p.m.
International Harvester Company	422–423–424	Sept. 28 bet. 1 p.m. and 5 p.m.
International Motor Company	448	Sept. 29 bet. 9 a.m. and 12 noon
The Lang Body Company	449	Sept. 28 bet. 1 p.m. and 5 p.m.
Mack-International Motor Truck Company	443–445–447	Sept. 29 bet. 9 a.m. and 12 noon
Mack Motor Truck Company	442–444–446	Sept. 29 bet. 9 a.m. and 12 noon
Mack Trucks, Inc	441	Sept. 29 bet. 9 a.m. and 12 noon
Murray Corporation of America	425–426–427–428	Sept. 28 bet. 9 a.m. and 12 noon
Reo Motor Car Company	404 and ½ of 405	Sept. 28 bet. 1 p.m. and 5 p.m.
The Six Wheel Company	600–601	Sept. 29 bet. 1 p.m. and 5 p.m.
Saf-T-Cab Corporation	453 and 455	Sept. 28 bet. 9 a.m. and 12 noon
Studebaker Corporation of America	473–474–475	Sept. 28 bet. 1 p.m. and 5 p.m.
Versare Corporation	476	Sept. 28 bet. 1 p.m. and 5 p.m.
Twin Coach Company	468–469–470–471–472	Sept. 29 bet. 1 p.m. and 5 p.m.
Walter Motor Truck Company	604–605	Sept. 28 bet. 9 a.m. and 12 noon
The White Company	657 to 662, inc.	Sept. 29 bet. 1 p.m. and 5 p. m.
C. H. Will Motors	495–496–497	Sept. 29 bet. 1 p.m. and 5 p.m.
Yellow Truck & Coach Manufacturing Company.	414 to 421, inc.	Sept. 29 bet. 9 a.m. and 12 noon

"It is not considered necessary," Mr. Dell said, "to dwell upon the importance of this schedule being observed. If your equipment does not arrive when scheduled, inconvenience is caused other exhibitors and it may be necessary for you to pay an extra charge in order to get your vehicles placed, because of the possible necessity of rehandling other exhibits which have been set up.

"Buses or trucks arriving in Cleveland under their own power, can be delivered by owners' drivers direct to exhibition space and placed. Buses arriving by freight, where necessary to unload from cars, will be handled by Norris Bros. Company (official draymen), at the same rate as prevails for exhibit materials."

Companies driving buses over the road and wishing to have them washed, can instruct drivers to take them direct to the Auditorium Building Operating Company, East Sixth Street and St. Clair Avenue, Cleveland, Ohio. The schedule of rates including exterior wash, chamois body polish, and interior sweeping and dusting is single-deck buses, $3; double-deck buses, $4. Any single-deck bus that must be stored until the exhibitor has an opportunity of placing it in his exhibition space, will be charged for by the Auditorium Building Operating Company at a flat rate of $2 per night, or for 24 hours for such storage. The storage charge for double-deck buses would be $1 per night or for 24 hours. However, the double-deck buses would not be stored in inside space but would be outside of the building and under responsible watchman service.

Exhibitors are requested to hang from each steering wheel a tag showing the space number where the vehicle is to be placed. This will save moving around. They are also requested to advise Norris Brothers Company, 2138 Davenport Avenue, Cleveland, Ohio, whether the bus or truck will arrive by rail or under its own power, also as to the exact date it will arrive in Cleveland, so the company may plan its other trucking accordingly.

Attention is once again called to the clause in the space contract reading: "The tanks of all motor vehicles must be drained and all vehicles made inoperative immediately after being placed in exhibition space." Drip pans or oil proof canvas should be provided by the exhibitor for the protection of floors. No change of tires will be permitted between 12 noon, Oct. 1, and 12 noon Oct. 7.

Two Objects Cannot Occupy the Same Place at the Same Time

If you, Mr. Truck and Bus Exhibitor, will bear this law in mind there will be no confusion or regrets at the big

CLEVELAND SHOW
Oct. 3-8

Read Freddie Dell's schedule for the arrival of Automotive Exhibits

You Can't Get By When The Road's Obstructed

Double Trackings In Detroit To Begin in Thirty Days

A mile of double track, estimated at $140,000, will be laid on the Fourteenth Avenue and Trumbull Avenue car lines within 60 days, according to an announcement by Del A. Smith, general manager of the Department of Street Railways in Detroit. The work will begin within 30 days and is to be completed on Oct. 15.

Extensions will involve 1 mile of double track on Livernois Avenue from Davison to Fenkell Avenues, linking the present terminus of the Fourteenth Avenue line at Davison and Livernois Avenues with the present Trumbull Avenue line between Fenkell and Six Mile Road on Livernois Avenue. The Trumbull Avenue line will be extended 1 mile west from Livernois on Fenkell Avenue to Wyoming Avenue.

Work on Boston Subway Extension Continues

Work is about to start on the fourth section of the Dorchester rapid transit system in Boston, a $10,000,000 project which was begun three years ago. There were eight bids for the work, ranging from $401,565 to $537,475, the lowest bid being from the C. & R. Construction Company, which also received the contract for the third section, now almost completed. The fourth section runs from Peabody Square to Shawmut Junction, and includes the Ashmont station. It will take about 300 days for its construction.

New Season Opens for Metal Sellers

Not much activity was expected in the non-ferrous metal market in the week ending Sept. 6, what with the Labor Day holiday and all, so potential sellers were not particularly disappointed at the disinterestedness of consumers.

Copper prices are again practically unchanged after another week, with only a small volume of trading. Most producers continue to offer the metal at 13¼ cents delivered in the East and 13⅜ cents in the Middle West, with only an occasional sale of a small lot. On the other hand, custom smelters are sellers at as low as 13⅛ cents, and manage to get rid of enough to prevent their cutting prices further. The foreign market also continues quiet, with the c.i.f. price unchanged at 13½ cents.

The lead market continues to decline and consumers have displayed little or no interest. One large seller is almost out of the market, but, nothwithstanding this, prices declined perceptibly. On Sept. 6 the American Smelting & Refining Company reduced its contract price from 6.50 cents to 6.40 cents New York.

Tin has remained steady, but there has been little or no demand by consumers, sales being mainly to dealers.

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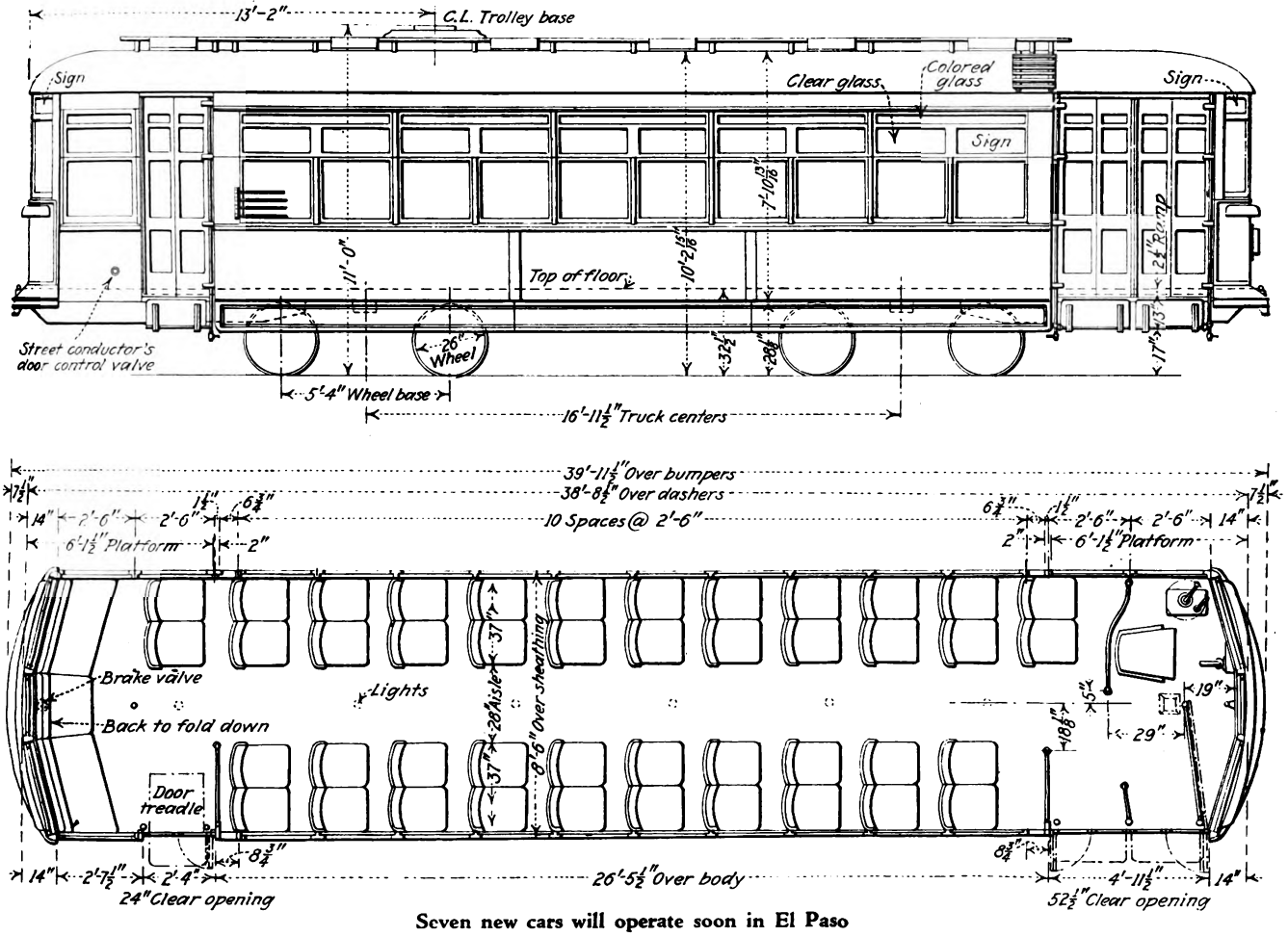
Rushing Work on New El Paso Cars



Seven new cars will operate soon in El Paso

Specifications and details are available for the seven single-end, double-truck cars which on delivery will be placed in city service by the El Paso Electric Company, El Paso, Tex. The order, announced in the ELECTRIC RAILWAY JOURNAL previously, was placed with the American Car Company, St. Louis, Mo., on Feb. 28. The cars will have an over-all length of 39 ft. 11½ in. and will seat 49 persons. Following are the principal specifications:

Number of cars ordered	7
Type of car	One-man, motor, passenger, city, single end, double truck
Builder of car body	American Car Company St. Louis, Mo.
Bolster centers	16 ft. 11½ in.
Length over all	39 ft. 11½ in.
Length over body posts	26 ft. 5½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8½ in
Height, rail to trolley base	11 ft. 0 in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Axles	A.E.R.A.
Car signal system	Faraday
Compressors	DH-16
Control	K-75
Couplers	American Car Company
Curtain fixtures	National Lock Washer Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	American Car Company
Doors	Folding
Fare boxes	Johnson
Floor covering	Battleship linoleum
Gears and pinions	Helical
Hand brakes	Standard drop brake handle
Hand straps	Sanitary
Heaters	Consolidated Car Heater Company
Headlights	Golden Glow S.M. 96
Headlining	Haskelite
Interior trim	Mahogany, bronze nickel-plated
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Safety Car Heating & Lighting Company
Motors	Four General Electric 510-A, inside hung
Roof material	Canvas
Safety Car devices	Safety Car Devices Company
Sash fixtures	Schec ter post casing
Seats	Heywood-Wakefield
Seat spacing	30-in.
Seating material	Genuine leather
Slack adjusters	American Brake Company
Steps	Folding
Step treads	Feralum
Trolley atchers	Keystone
Trolley base	Ohio Brass Company
Trolley wheels	Fiest
Trucks	Brill 177-E-1-X
Ventilators	Utility combination honeycomb
Wheels	26-in., Davis cast steel
Wheelguards	H.B., six-bar type
Special devices	Economy meters

Great Northern to Spend $1,000,000 for New Electrical Equipment

The Great Northern Railway has made a contract with the Westinghouse Electric and Manufacturing Company for $1,000,000 worth of new electrical equipment to use in operations on the Cascade Mountain division of the road. The company is building an 8-mile tunnel on this road, from Berne, Wash., to Scenic, the project to be completed late in 1928. Electrification of this division was begun in 1926. The six locomotives are of the motor-generator type, the largest made and like two put in service last spring. Two large single cab locomotives have been ordered from the General Electric Company, one of which will be delivered in a month. This electrification project was recently reviewed in ELECTRIC RAILWAY JOURNAL.

$3,000,000 Repair Shop for New York City's New Subway

New York City will have a $3,000,000 car shop and maintenance plant for its new subway system. The plant will be on the tract of 49 acres between 207th and 215th Streets, from Tenth Avenue to the Harlem River, Borough of Manhattan.

Contracts are now being carried out for grading the site and building a bulkhead and car float bridge on the river side of the yard. The contract to be advertised for construction following the public hearing provides for a main group of buildings constructed of brick 35 ft. high and located on the Tenth Avenue side of the yard. The main group of buildings will be sub-divided into ten units, comprising the machine shops, electrical repair shops, car shops, track shops, wheel and axle shops, wood mill, carpenter shop, blacksmith shop, paint shop and inspection shed. There are to be ten separate structures, segregated from the main plant, which will provide for an electric power substation, office and storehouse, materials shed, oil

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house, boiler house, service building, coal and ash hoppers, signal tower and maintenance building.

The total area of the buildings included in the contract under consideration is 459,000 sq.ft., or 21 per cent of the total acreage of the site. The balance of the yard will be utilized mainly for storage tracks, which will be approximately 15 miles in length, and on which there will be storage capacity for a minimum of 500 cars. Of the 15 miles of tracks in the entire yard, about 3 miles will be located within shop walls. Some of these will be over inspection pits and others will be used for shunting cars for repairs and maintenance.

By the terms of the proposed contract, the entire plant must be completed within eighteen months from the date of the execution of the contract.

It is proposed to synchronize the work into three groups so as to make the plant available for service before the interior finish has been applied, such as tiling, painting, etc. The program of construction will be carried out as follows: In the first ten months the service building, substation, signal tower and portal wall from the spur tracks under 207th Street must be completed; within the following five months the storehouse, electrical repair shops, machine shops, car shops, track repair shops, wheel and axle shops and boiler house must be completed, and the balance of the plant within the succeeding three months.

Erie Railroad Buys Two Oil-Electric Units

The Erie Railroad has ordered two 100-ton oil-electric locomotives for yard-switching service in the city of Akron, Ohio. A 60-ton locomotive of similar type was bought more than a year ago for use in their 28th Street yard, New York City.

Units now ordered for service in Akron, being of the 100-ton type, are larger and more powerful than the one purchased last year. The first locomotive units will be shipped to Akron between Sept. 1 and 15. General Electric Company, the American Locomotive Company, and the Ingersoll-Rand Company have collaborated in producing these units.

Scraper Business Is Brisk

The Root Spring Scraper Company, Kalamazoo, Mich., reports the sale of 98 life guards to the Pittsburgh Railways, also a $1500 repair order for life guards from this utility. Other orders include 125 No. 7 air operated scrapers and 30 life guards for the railway department of the city of Detroit. September 10 is the day set for shipping 20 hand operated snow scrapers to the St. Louis Car Company for installation on the new units now under construction for the Chicago, North Shore & Milwaukee Railroad. Last week the Root Company shipped 20 life guards to the J. G. Brill Company, Philadelphia.

METAL, COAL AND MATERIAL PRICES—F. O. B. REFINERY

Metals—New York	Sept. 6, 1927
Copper, electrolytic, cents per lb.	12.975
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.40
Zinc, cents per lb.	6.25
Tin, Straits, cents per lb.	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.375
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons.	1.95
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons..	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20–5.70
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.0
White lead in oil (100-lb. keg), N.Y., cents per lb.	13.75
Turpentine (bbl. lots), N.Y., cents per gal.	62.0

City Type Buses in Demand

Bus body styles as far as electric railways are concerned continue to follow very closely upon the heels of past performances, according to the delivery report of the Mack International Motor Truck Corporation, maker of Mack trucks and buses. For some time past monthly reports have indicated a general demand for city type or street car type bus body with requests about equal for 25 or 29-passenger capacity. Some parlor car or de luxe bodies are sold for long interurban or suburban operation. Fifty-five per cent of deliveries in May were four-cylinder models. Seventy-two per cent of total deliveries were city type buses, the 29-passenger capacity model having the edge on smaller capacities.

Galena Oil Ltd. Purchased by Standard Oil Subsidiary

Purchase of the Galena Signal Oil Company, Ltd., of Canada, by the Imperial Oil Company, Ltd., has just been announced. The Imperial Company is a subsidiary of the Standard Oil Company of New Jersey, and was previously owned by the Galena Signal Oil Company. No terms were made public.

ROLLING STOCK

ALABAMA POWER COMPANY, Birmingham, Ala., has received a 25-passenger Mack bus whilch will replace the street cars on a line in Gadsden, Ala.

BUS TRANSPORTATION COMPANY, bus-operating subsidiary of the Public Service Company, Wheeling, W. Va., is using a Gramm bus to supplement the street car service.

PUGET SOUND POWER & LIGHT COMPANY, Seattle, Wash., will repaint and overhaul all of its rolling stock. The cars will be painted apple green and straw color. They will be painted one at a time.

CONNECTICUT COMPANY, New Haven, Conn., has accepted delivery on three Mack city type buses, 29-passenger capacity, four-cylinder motors, mechanical drive, 225-in. wheelbase. This company now has 27 Macks in operation in New England. The company's first purchase consisted of two 25-passenger buses, 192-in. wheelbase, in May, 1923.

UNITED ELECTRIC RAILWAY, Providence, R. I., has received four Mack city type buses, six-cylinder motors, 233-in. wheelbase, 29-passenger capacity. This company now operates fourteen Macks, several of which were purchased in June, 1922.

SCIOTO VALLEY RAILWAY & POWER COMPANY, Columbus, Ohio, has purchased a number of new parlor cars, according to announcement of General Manager R. E. Johnson, at the company's office in Columbus. Three of these cars are now in operation and another will be received in the near future.

TRADE NOTES

BENDER BODY COMPANY, Cleveland, Ohio, has designed a new de luxe coach for the new White 6 chassis. Many new features have been combined in the body, passenger comfort being the keynote of the design.

MACK-INTERNATIONAL MOTOR TRUCK CORPORATION announces the following changes in personnel in the Southern division: J. C. Rowold, formerly branch manager at Miami, Fla., is now branch manager at Charlotte, N. C.; R. W. Huffman, manager of the St. Petersburg, Fla., branch has been transferred in the same capacity to the Miami office; W. N. Costello succeeds Mr. Huffman as head of the St. Petersburg branch.

ADVERTISING LITERATURE

OHIO BRASS COMPANY, Mansfield, Ohio, in a circular recently sent out, describes the improved O-B trolley wheel and harp.

INTERNATIONAL OXYGEN COMPANY, COMPANY, Newark, N. J., recently issued catalog No. 27 on welding and cutting equipment.

SULLIVAN MACHINERY COMPANY, Chicago, has issued three advertising bulletins, No. 76-F, describing portable turbinair hoists, No. 81-N on Sullivan spaders and No. 83-F showing two types of portable air compressors.

PYRENE MANUFACTURING COMPANY, Newark, N. J., has distributed a catalog page announcing the new 2-gal. Pyrene hand pump extinguisher.

FISK & ROBERTS, New York, are distributing a sample time-table form which is used by them in preparing working time-tables for transportation companies. This form is intended particularly for companies whose use of such a form is limited and to whom the cost of a lithograph or engraving would be prohibitive.

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Electric Railway Journal

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Meeting the Demand for BETTER TRANSPORTATION

ONLY a few years ago the electric railway industry was laboriously struggling up the road of recovery, carrying a staggering load of public burdens cumulatively imposed. For more than a decade it had been encountering fresh obstacles at each step. A method of surmounting each new difficulty was no sooner devised than trouble from another quarter loomed on the horizon. A tired and discouraged industry sought to maintain faith in the future and strained vainly to catch a glimpse of the bend in the road ahead.

Today those who are in position to view in perspective the ground gained are united in the conviction that the turning point has not only been reached but has been definitely passed. There is a widespread feeling that the succession of difficulties is nearing its end and that the energy and ingenuity which have for years been spent in staving off disaster may now be directed toward accelerating progress. Each step forward may be expected to count as a definite net gain instead of being merely an offset to a backward drift.

Of course the road is still far from smooth. That makes it difficult for those in direct contact with day-to-day problems to see clearly that substantial gains have been made in a comparatively short period of time. But there is much work left to be done. A better understanding of the part which organized public transportation can be made to play in bringing about more efficient use of existing street facilities is necessary before the industry may be expected really to hit the full stride of development and expansion to which it is destined. In preparation for this larger destiny it is important that transportation executives win for themselves a position of recognized leadership in community affairs. This they can do only by gaining public confidence through demonstrated sincerity of interest in the community's problems and by being fully qualified to speak with authority on matters affecting street traffic.

In addition to all this, one outstanding and pressing problem demands immediate and concentrated attention. It is the last great obstacle that blocks the industry's path. Everything depends on our ability to surmount it. In short, a way must be found to win a growing volume of business from an automobile educated public. The character of service must be brought up to the level of present-day transportation standards.

IT IS no easy matter to determine the relative importance of the various factors which attract riders to our cars. We know that cars must be quieter, faster, more comfortable and more attractive in appearance; that service must be more frequent; that there must be less crowding in rush hours; that employees must be more courteous and better trained as salesmen. We know and are discussing many other factors which influence our success in winning riders. But we are still a long way from determining just how, and just how far, improvement in each of these elements of our service can be brought about. What are the elements that make for attractive car appearance? To put this another way, what is a good-looking street car, and how much does its appearance affect the number of people who ride? What are the most comfortable seats, and how far can an operating company afford to go in adding to first cost and maintenance expense in finishing and equipping cars?

The industry must find the way to increase its riders at a profit. In every step of this process, however, there is the problem of balancing improvements against the revenue required to make them self-supporting. It is necessary to find the field for each form of public transportation service and for each type of vehicle, whether on steel or rubber tires. Hope of breaking down the last great obstacle in the way of complete recovery for the industry depends on our ability to meet today's demand for better transportation.

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The Right Type of Car Helps to Build Riding

STYLES exist in transportation just as they do in clothes, furniture or jewelry. What is popular today may be out of date tomorrow. Often the style is adopted because some one else has decided it for a reason entirely foreign to the ones that should govern logically. In the past there has obviously been too much tendency for the rank and file of the transportation industry to follow the styles set by the leaders, who usually are located in the cities with heaviest traffic.

Cars designed for service in the largest cities frequently have been adopted in small towns. Worse still, units that have outlived their usefulness for the big companies have frequently been sold to smaller companies and used without change in a class of traffic for which they are entirely unsuited. There is a strong temptation to use cars too large for a given service, first to get increased capacity per platform employee, and second to imitate a larger neighbor.

Two fundamentals underlie all community transportation. These are speed and headway. The patron wants to go from one point to another in a minimum time. Whether he spends time in riding or in waiting for his conveyance, he is equally annoyed at delay. Headway, however, seems even more important than speed, particularly where the rides are short; as the time saved by fast running may easily be lost if the spacing between vehicles is so great that long waits for the cars are necessary. For instance, if the headway is fifteen minutes, few persons will ride the cars for the distance of a mile or less, because the time of the walk will be little if any greater than the time of the ride plus the average wait. Those who do desire to ride are more than likely to use their own automobiles.

Where the traffic is light it follows naturally that the smallest unit consistent with economy of operation is the one to use. Here conditions dictate the single-truck, one-man car. For territory that is more densely settled shorter headways with small cars are preferable up to the point where the urge to walk as a means of saving time has been fully met with frequency of service coupled with reasonable schedule speed. Beyond this it is desirable to increase the size of the unit rather than to give greater frequency of service, using light-weight, double-truck cars. This reduces congestion, increases the comfort of the passengers and lowers operating costs.

For the heaviest traffic the smaller double-truck cars do not have sufficient capacity, and under certain conditions even the largest double-truck cars are insufficient in size. When such extreme traffic density is reached, it is desirable to run the large cars in trains of two or more, or to group bodies together into articulated units. The situations which cannot be met with these types of equipment are rare, although the growth of American cities is making the problem acute in several of the larger communities. For these, of course, the logical thing is to provide rapid transit lines on exclusive right-of-way, leaving to surface transportation the local business.

With the field thus divided, there is a rather distinct need for all the types of cars—single-truck, small double-truck and large double-truck. All of them should be relatively light in weight, although the large cars should be adaptable to train service. In any particular community, except the smallest, all three types may be needed to cover to the greatest satisfaction the demands of the riders and to get the greatest revenue. While a compromise is sometimes made for economy, it may be questionable whether the savings effected by standardization will offset the loss of traffic where large cars on long headways are employed to serve some of the less densely settled districts. Each case should be studied carefully if the correct type of car is to be selected.

Economics of Bus Operation Better Understood

GRADUALLY the place of the bus in the general transportation scheme is becoming more clearly defined. It is still too early for a final definition of its field of usefulness, but great strides have been taken away from the chaotic thinking which prevailed on this subject a few years ago. One reason for the confusion that existed is that we have been inclined to consider buses as a homogeneous species, whereas in reality there are many different kinds of buses in many different classes of service. Large buses and small, single-deck and double-deck, street car type and de luxe; each has its place, but they cannot be used interchangeably.

It is now evident that one of the major fields of usefulness of the bus is in rendering a class of service different from that of the electric railway. By furnishing service superior in comfort, convenience and speed to that of the street car the bus meets a real transportation need. Despite the higher fare which must necessarily be charged for such service, experience in various cities where de luxe service has been tried shows that there exists for it a substantial demand. Indeed, the actual extent of this demand has never been measured, because it continues to grow rapidly as facilities are increased. Apparently the saturation point is a long way off.

Street car type buses also have a real place in the general transportation scheme. It is not as a substitute for the rail car in any large way, however, that this type bus is most useful, but rather as an auxiliary to supplement and extend the service. On lines of heavy traffic the bus can be used to advantage in express service, while the cars do the local business. Whether such express service should be operated at street car rates of fare or whether de luxe or semi-de luxe service should be given at a higher fare depends on local conditions. Both kinds of operation have met with marked success. Use of the bus to do local business while the cars operate express has been tried to a limited extent. In general it has been found easier to maintain high schedule speeds with small capacity vehicles on rubber tires than with rail-bound vehicles of larger capacity. Greater economies can be accomplished, however, by saving hours on a heavily traveled line, and it is likely that express car and local bus operation will be developed more extensively in the future. Use of buses as extensions to the rail system is so well known as to need no comment.

Double-deck buses have done well under conditions favorable to their operation. Experience shows, however, that something more is needed for their success than mere density of traffic along a particular route. Their field of usefulness appears to be in giving a service that combines elements of sightseeing with straight transportation. Unless the sightseeing element is present, passengers will not use both of the decks to an extent sufficient to make this class of vehicle economical in comparison with the single-deck bus.

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Great as has been the progress made in fitting the bus into the transportation scheme, its proper place is not yet understood by all. Electric railway men were slow to take up the bus. During the past two or three years the tide has turned and many thousands of buses have been put in service by the railways. Now there is a tendency in some quarters to condemn bus operation as an unprofitable venture. So it has been where the right type bus has not been used in the right place. Therein lies the secret of success. The transportation demands of each community, and each section of the community, must be met with vehicles of appropriate type.

Out of the School of Experience

NO NEED exists to attempt improvement or embellishment of the statements made elsewhere in this issue regarding the outlook for the industry by operators in the North, East, South and West. Idealism has come into the railway business. A seat for every passenger is still a long way off, but the industry apparently is headed in that direction. It is no accidental concept. Neither are the other concepts of speed, comfort and convenience in transportation, so strongly emphasized, nebulous things of the future. Of course, reservations must be made. No business can give a service out of proportion to the rates charged.

While low-fare transportation may be looked on as a basic commodity, the comments of these experienced operators show that the brand of transportation furnished a generation ago is by no means acceptable to the public of today. It is only by having sufficient discernment to sense the demand and to satisfy it that the transportation system of tomorrow is to be successful. Qualities that are being demanded are speed, comfort—almost luxury—and frequency. It is not for the men of the industry to cry that the use of private automobiles has perverted the public taste. Should conditions change and a demand for plain food be made, then is the time to curtail and to furnish a product at a minimum price.

Each man speaks from the fullness of his own experience and of his own observation. Other businesses have had to be revamped. It is no discredit to the electric railways that they have been forced to do so. More is it to the credit of the industry that so many have recognized the need, and set about the process so convincingly. He always finds it difficult to survive who opposes himself to custom. And transportation customs are changing rapidly. Utopia is not likely to burst upon us, but the railway man who correctly senses his obligations and intelligently sets about the task of meeting them is no longer a pariah among the dispensers of the world's goods.

Sound Basis Important in Rapid Transit Planning

RAPID transit is a major problem confronting all large cities to-day. No other single factor has greater influence on their development. Provision of adequate transportation facilities is essential to the welfare of the community. In the past there has been too much haphazard construction. There has been too little realization that transportation is a civic matter.

Experience has demonstrated conclusively that a rapid transit system cannot be built and operated on a self-supporting basis under present-day conditions without an excessive fare. Since the car rider cannot be expected to carry the whole burden, part of it must be carried by the other beneficiaries. The city as a whole benefits to some extent through the increase in roadway space brought about by the removal of traffic from the street to the rapid transit right-of-way. The adjacent property owners benefit largely on account of the increased accessibility of their land. These beneficiaries must pay part of the cost if the expansion of facilities is to keep pace with the community's growth.

Congested conditions now existing in large cities are the direct result of concentrated commercial development. It has been customary to condemn this tendency to concentration, but a different view of the situation is expressed in an article on rapid transit appearing elsewhere in this issue. Concentration undoubtedly promotes efficiency in the conduct of business, by reducing the time required to go from place to place. Centralization of many business activities within a comparatively small area is feasible only where rapid transit lines exist to carry the large number of people who live in remote localities into and out of this district every day. Thus it may be said that adequate facilities of this kind are essential to the most efficient conduct of business, as they are to healthy civic development.

It must be remembered, however, that there are physical and economic limits beyond which it is practically impossible to carry the provision of rapid transit facilities. When the cost of transportation becomes greater than the value of the time saved, however, concentration ceases to be desirable. Careful planning and close co-operation between municipal and transportation officials is essential to the creation of a successful rapid transit system.

Franchises and Regulation Needed for Taxicabs

HAS the taxicab a place in a system of co-ordinated community transportation? In two major cities of the country this question has apparently been answered in the affirmative by existing local transportation companies. Undoubtedly the taxicab affords the nearest approach to the service of the privately owned automobile. Operation by a responsible company in co-ordination with other existing forms of transit would seem a step in the direction of stabilizing the character of such individual service and of making it an active agency for reducing the use of private automobiles on congested city streets.

From the standpoint of operation at a profit, however, the taxicab presents a number of problems. The financial history of its operations is by no means an enviable one. Although the general effect of competition has exerted some pressure toward a lower scale of taxicab rates, when the rates have gone down the character and the reliability of service have degenerated to a point that seriously reduces its desirability. The situation of this business is an example of the degenerating effect upon any utility service of destructive competition brought about by the lack of monopoly and adequate regulation. The need for regulation and organization with the concomitant elimination of destructive competition must be more generally heeded by public officials before transportation companies may be expected generally to add taxicabs as the next logical step in rounding out their service.

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Building Increased Riding
Is the Industry's Greatest Immediate Problem

Economical operation is important, but the industry's future hinges on increasing revenue. Public transportation must win out on its merits if it is to survive the inroads of the automobile

By B. C. Cobb
Chairman Advisory Council
American Electric Railway Association

IF THE local transportation industry is to survive and develop on a profitable basis, it must find a way to increase riding and build up its revenues. Every measure adopted to meet the demand for better transportation must have as its definite object the increase of patronage on the public transportation system. Electric railways have met during the past ten years—and in general have survived—a series of unprecedented burdens and difficulties. They have hung on with great courage, and with almost superhuman ingenuity have counteracted one difficulty after another with compensating operating economies.

To the fact that public transportation constitutes a basic necessity in the life of every community of any considerable size, and to the operating economies which have been devised to meet rising costs and unfair burdens, may be attributed the survival of this business today. Economy continues to be important. The street railways of the country are far from a position where they can afford to relax for a moment the strictest vigilance over every penny of operating cost. But they cannot continue to exist, much less develop, on a declining or even stationary volume of patronage. The problem of the moment is to increase riding. It is futile to dodge the fact that this is most serious and baffling.

Street railway riding has increased during recent years on some of the larger properties, but this has occurred principally in the very large cities where the use of private automobiles is materially curtailed by congestion. In cities where there is opportunity for the optional use of automobiles, street railway riding is barely holding its own, and in many of the smaller cities is failing to do so.

At first glance this may present a gloomy picture of the situation, and in a measure that is true. However, when we stop to consider the immensity of the difficulties through which local transportation has come, it is at least conservative optimism to believe that the recurring series of obstacles encountered have run their course and that a better public understanding and increased public co-operation will make it possible for transportation systems to surmount the greatest hurdle of all—that of increasing riding in the face of unprecedented growth in the use of private automobiles. That this solution lies in the direction of meeting more nearly than has been done in the past the present-day standards of transportation demand is apparent to any one having a knowledge of the rudimentary principles of merchandising.

I have faith in the local transportation industry and in its ability to meet present conditions. That does not mean that all present properties will survive. Some of them should never have been built. But I am convinced that the modern city must have efficient public transportation and that the only course available for attracting sufficient revenue to these properties, to put them on a profitable basis, is that of determining a proper balance between the character of the service offered and the rate of fare charged.

In the past electric railways have been too timid in approaching the matter of an adequate fare. The American people have become accustomed to paying two or three times what they formerly did for practically every necessity of life, and increases in even far greater proportion in the case of luxuries. There is no reason under the sun why transportation should be an exception. There is considerable evidence that the public is acquiring a better conception of the relation between service and rate of fare. In most cities throughout the country there has been some measure of relief granted, and it is reasonable to assume that an adequate fare basis can ultimately be obtained.

There are many examples of the tendency on the part of the public to assume a more reasonable attitude regarding franchise conditions, taxes and unfair imposts. This public awakening is one of the most encouraging tendencies in the present railway situation. If service can be so developed as to win an adequate increase in riding at rates of fare that will show a reasonable profit, then local transportation will again have definitely

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entered a period of successful operation and development.

Right here let me add a thought on the automobile. There is no question but that the individually owned car is the greatest competitor of our public transportation systems. But even though the automobile is responsible for the checking of electric railway riding, and some classes of steam railroad riding as well, it has at the same time greatly added to the sum total of the opportunities for wholesome relaxation and pleasure for workers in moderate circumstances. The automobile industry has become of major proportions in our industrial life. It provides employment for thousands of workers and is an important element in the prosperity of many lines of industry.

The right to use the individually owned car is one that cannot be questioned. Needless restrictive legislation is a bad thing for industry generally and for the nation. Of course, the right to the use of automobiles should not include the right to store them in congested public streets or highways. The user of an individual machine must not be permitted to interfere or retard the use of streets by those millions who travel on street cars and who may or may not be able to afford a private car. At the risk of repetition I want to stress the point that public transportation service must win out on its merits if it is to remain a sound investment for private capital.

To my mind that is the alpha and the omega of meeting the demand for better transportation. Low fares will not attract sufficient riders to compensate for the loss in revenue that results. The character of the service rendered in each community must be adjusted with the primary object of attracting riders on an adequate rate of fare. In many cases this demands more attractive equipment. Street cars must appeal to the eye of the prospective rider as well as to his purse. Likewise they must be quieter in operation, faster and more flexible. All these things are elements in meeting the desires of the automobile educated rider. Upon the question of whether or not they can be made to pay hinges the future of the industry.

Progress of the Year in Meeting the Demand for

Better Transportation

A changed public requires something more of public transportation than in the past. Both operators and manufacturers have a responsibility in meeting present-day conditions

By W. H. SAWYER
President American Electric Railway Association

TRANSPORTATION is a vital community requirement. The roots of our industry are buried deep in the foundations of community prosperity and growth. But during several years conditions have been changing rapidly. Yes, changing, not yearly or monthly, but daily. During the past year there have been many changes. There has been outstanding progress on many properties. In few instances, however, have the possibilities for the further development and improvement of the local transportation industry been exhausted.

That doesn't mean that all existing transportation properties can be made profitable. Some properties are headed for the scrap pile. They don't have and probably never did have the potential revenue-producing territory that is the essential reservoir to which any improvement or development program must look as its source of profit. This same qualification applies to some of the lines on properties that as a whole are sound, but that need to have unprofitable appendages lopped off before the enterprise can be put on a sound operating basis.

Returning now to the question of meeting the demand for modern transportation. That is the big job before the industry, and one on which considerable progress was made during the past year by many properties. It consists of developing public transportation vehicles and service to meet the present-day public's ideas and demands. This is a different public than we have been accustomed to serve, and for which most of the cars we operate were designed. It is an automobile educated pub-

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lic. A "silk stocking" public, it has been called. Meeting the demand for modern transportation to me means raising the standards of each class of public transportation to meet the tastes and desires of today's public. Improved cars alone will not do that, but they are an essential part of an improvement program. There must be smooth track as well; quieter operation, higher speed, increased frequency, greater reliability, more courteous service—more personal service would be a good way to express it. The automobile rider has tasted the luxury of individual transportation. He is no longer content with former standards of the public carrier, even at a very large saving in cost. In fact, experience is beginning to show that cost is secondary and that electric railways have overestimated the effect of fare on the volume of riding, provided, of course, that the character of service is improved in proportion to the increase in fare. I am convinced that a 10-cent base fare standard is justified and necessary to insure a character of service that can successfully compete with the automobile.

Looking back over the past year, there have been many interesting and encouraging developments. Many of these have already shown promising results in the way of increased revenue, better public relations and reduced costs. But in my opinion the industry has in large measure only begun to develop the possibilities of meeting the demand for better transportation. Look at our cars, our track, our schedules, our fare structure; the deportment and performance of our men, our advertising, our relations with the public we serve, our interruptions to service, our maintenance facilities and methods—in fact, every one of the multiplicity of divisions of our property and activity. Would any manager contend for a moment that he had reached the limit of improvement in any one of these important factors that, taken together, determine the character of our service? Perfection must be our ideal—or as nearly perfection as it is humanly possible to accomplish. Only then can we afford to rest on our oars. Only when we have completeley exhausted the possibility for improvement in every one of these elements of our service are we even for a moment justified in admitting that the automobile has us on the run.

Public transportation is a conserver of expensive street capacity. Let us not forget that and let's not miss a single opportunity for driving it home in the minds of the public. Public transportation also provides a ride for only a small fraction of the cost in an automobile. These are two of the fundamental economic facts that form the foundation underlying our industry. By being determined to win out we can find the way of putting public transportation once again on a really profitable basis. The electric railway industry must and will go forward—and that is in the direction of meeting more nearly than we have done in the past the modern standards of transportation service.

In the solution of present-day problems, particularly that of meeting the demand for better transportation, manufacturers as well as operators have a direct responsibility. In certain respects, the manufacturer has been somewhat backward. But by no means has this been entirely the builder's fault. Some of the responsibility for the manufacturing situation lies directly at the door of the operators. Nevertheless, even the builders have been slow to recognize the great need for development and improvement of the street car. They have shown some evidence, like many operators, of lacking faith in the industry of which they are a part. Indications are that this situation is changing rapidly and that we shall soon have available for the job of meeting the demand for better transportation a wide selection of cars designed and developed to meet today's critical requirements.

There are many factors which have held back the improvement of the street car. By this I do not infer that car and equipment design and construction have stood still, for that would not be true. There has been substantial progress in construction and in weight reduction. Reduced costs and improved efficiency are important, but they are not enough. Attention to the ride selling features of design and equipment are equally or even more important. Even in structural design, however, recent developments indicate that we have been bound too much by the limitations of habit and precedent.

A discussion of the year's progress would be incomplete without some reference to the part which the bus plays in providing public transportation and in the advance that has been made in finding its place in the general transportation scheme. Much of the novelty and glamor of the bus has disappeared, and we have broadened our viewpoint considerably during the year so as to see the bus in proper perspective.

Even those who are enthusiastic regarding the field of the bus have come to see the folly of advocating a country-wide replacement of cars with buses. I have little patience with a discussion of buses vs. street cars. I think such discussion narrows the perspective of both car and bus men. I believe strongly that the bus will play a constantly increasing part in providing public transportation, and that it affords a railway not only a new flexible tool with which to meet some of its operating problems, but also a different type of vehicle with which to develop new classes of service and revenue.

Bus manufacturers have nearly all come to realize the value of this broadening of the bus field, which is the outgrowth of the policy of co-ordination. In my mind, the bus has a large place in the program of meeting the demand for better transportation. Its development and application were hindered rather than helped by those unfortunate instances of unsound sales policy which have now almost entirely given way to a policy of co-operation with existing carriers.

It takes courage to do the things that are necessary to meet modern conditions. It takes faith in the possibilities of the transportation business. But we have no choice. We must either move forward or pass out of the picture. The American people want something more in transportation than we have been accustomed to provide. I am convinced that they are willing to pay for what they want provided the transportation men of the country grasp an adequate conception of today's transportation demands. When I say that all this requires courage, I do not infer that transportation men have lacked courage in the past—they have faced conditions and encountered obstacles that many times seemed to be overwhelming. They have had the courage to hang on when the transportation situation seemed hopeless. But I am talking today about a different kind of courage; the courage to go ahead, to spend more good money in developing a character of service to meet present-day conditions.

Admittedly, public transportation has been a most important factor in the development of modern American communities. It is inconceivable that they can continue to develop without efficient service of the kind we are struggling to give. In that one basic fact lies the justification for our confidence in the future. Today's problem is one of developing the character of our service so as to win the public support necessary to its financial success.

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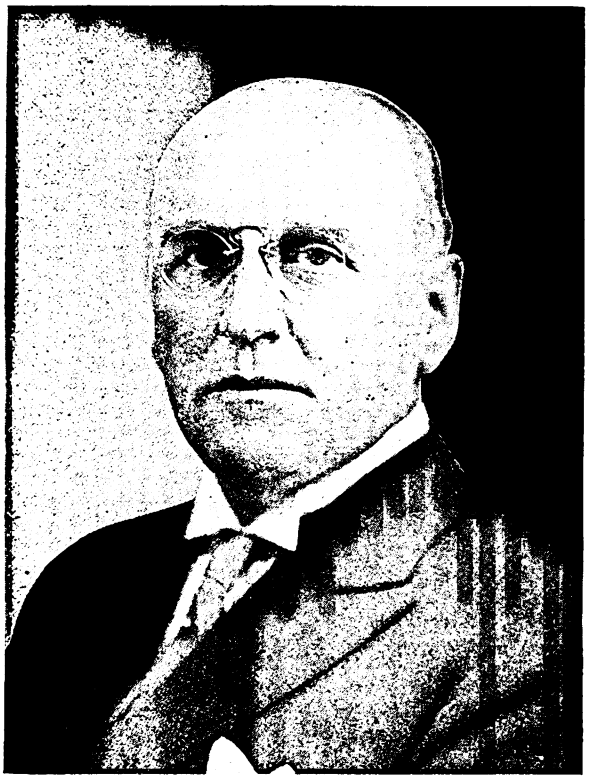
Looking Ahead

In Meeting the Demand for Better Transportation

By R. P. STEVENS
President Penn-Ohio Edison Company



MR. STEVENS, first vice-president of the American Electric Railway Association, looks to the future of the industry with optimism. For each difficulty encountered by the railways, a compensating remedy has been found. The industry has lagged, however, in so recasting financial structures that new capital may be obtained with which to make the physical improvements needed in meeting present-day transportation requirements.

I HAVE optimism as to the future of electric railways, because I feel that we are "over the hill." The post-war era of transportation difficulties is fading rapidly into an experience of the past. A very optimistic statement, yes, but to me the vision is clear enough to justify it. For every blow that the electric railways have received a remedy has been found promptly, and we have now reached a period where economies can count as a net credit rather than as mere offsets to deficiencies.

For the high cost of labor following the war we found one-man car operation to be the remedy. For the high cost of equipment we found lighter cars with lower first cost and maintenance. The "jitneys" have practically disappeared, to be replaced by the motor bus, which is just now finding its place in the scheme of things. We are taking advantage of it to round out and co-ordinate the transportation system of the community.

From a survey of the bus situation, based on the opinions of reliable operators in every part of the country, it appears that the trend continues this year in favor of the operation of more buses by electric railways. There is a notable uniformity of opinion that these buses will not be used to supplant electric cars, but rather to supplement the existing street railway service. We find independent operations assuming a position of declining importance, especially in city service.

In a large number of instances, bus operations at existing fare levels are not yielding a fair return on the investment. This is attributable partly to the fact that many such operations represent surplus service forced by the threat of competition or by public demand for the bus, due to its newness and novelty. In other cases losses which are experienced in bus operation offset heavier losses which would be experienced if rail lines were built to serve territory otherwise untouched.

On the other hand, it is apparent that many companies that have not yet adopted buses as an auxiliary to their street railway systems will be in the market for buses. With these purchases and the necessary replacements I do not anticipate that the requirements of electric railways will show any decrease in the immediate future.

It is becoming obvious today that some of the arguments on which the bus was promoted are unsound. It is becoming clear that the so-called "rubber urge" was merely the urge of novelty, and that the bus depends for its future on its ability to serve as another tool for meeting the demand for better transportation along with the street car and other forms of public transportation. Several of the elements in that demand are becoming better understood. The public shows much more permanent interest in whether or not there is a seat for every passenger than in the presence of rubber or steel tires under the vehicle in which it rides. When properly applied on fare levels which will make this economically possible, buses afford the opportunity of meeting this demand in situations where franchise limitations or the pressure for minimum fares make it impossible to give such service on street cars. There have also been developed in Pittsburgh, Washington, Kansas City and elsewhere examples of an entirely different standard of public transportation with buses at rates of fare approximating 5 cents per mile that show an attractive trend toward profits, and which promise

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considerable extension of this type of express, de luxe operations. In the field of special party, sightseeing and chartered service, the use of the bus shows an encouraging tendency toward rapid extension on an attractively profitable basis.

With this problem in a fair way to be solved, we have to turn to such matters as public relations and financing. When I think of public relations, I think largely in terms of partnership—getting partnership interest has been done with great success in the electric light and power field, an activity that has changed the sentiment of the entire country toward that industry. It insures the efficiency of private ownership and operation uncomplicated by politics, and at the same time enlists public support and friendship by the very fact of local public ownership in its senior securities, generally preferred stock.

So-called customer-ownership campaigns have been attempted in the electric railway field with success, but only in a few instances. It seems to me that if we would profit by the great success of our sister electric industry we should take greater advantage of this opportunity. I suggested this thought a short time ago to two different operators, and received practically the same answer in substance, viz., "our financial set-up will not permit the sale of a sound preferred stock and, of course, we cannot and will not try to sell a preferred stock unless it is a sound investment."

At the 1925 convention of the American Electric Railway Association, at Atlantic City, the committee on electric railway financing, after many months of work by some of the best financial authorities in this country, submitted a report on electric railways. It was generally accepted as constructive and very valuable to the industry, but in the two years that have elapsed since that report was submitted I have heard of only two companies that have taken advantage of the suggestions contained therein. I thoroughly agree with the answers that were given to me by the operators mentioned above, namely, that their present set-up will not permit a sound preferred stock financing, but the answer to this is "change the set-up."

The electric railway industry, in my opinion, is suffering more today from antiquated financial structures than from any other single cause based on present-day conditions. I know of no industry that is more susceptible to improvement. The electric light and power people, largely through customer-ownership campaigns, have changed the whole attitude of the American public toward this industry. Our industry has the same opportunity.

In the recent past we have had our back to the wall, making a desperate fight for existence. Not the least of our trouble was the fear of what the bus business was going to do to our electric railway transportation systems. Now, I believe, this bugaboo has been exploded and, instead of being a bugaboo, the bus can be used to great advantage for the development of electric railway transportation systems as a co-ordinated adjunct to them. In order to take full advantage of this opportunity and before we can expect the fullest results from our efforts, I believe we must give more attention to our financial structure and must put ourselves in a position where we can raise the funds necessary for improvement of our properties. I believe the far-sighted management that will take full advantage of the opportunities for financing, for improving public relations, and for application of operating economies, will open up an electric railway future that few of us ever dared hope for.

Why Not Grasp the

Transportation executives can take the lead in meeting the demand for better transportation by championing the broad interests of the community. Conservation of street space is essential to the reduction of congestion

By L. S. STORRS
Managing Director
American Electric Railway Association

IT IS not necessary to review the changes that have taken place in the transportation business during the past few years to prove that it is on the way toward a complete rejuvenation. Proof is not lacking that there has been a marked improvement in many of the underlying fundamentals that form the economic foundation of the industry. Nor is it difficult to trace out and show that the industry's troubles during the past decade or more were caused by the fact that it built originally upon an unsound economic structure. In the fire of experience and difficulty, this foundation has been crystallized into sound principles, upon which the industry's future is now being built, secure as never before. Finally, there has grown, out of necessity, a changed point of view regarding the relations between a transportation company and its patrons; an understanding of the methods and practices that must be used in meeting the changed situation brought about by an automobile-educated public.

The industry itself and the public which it serves have made truly remarkable progress during the last several years in coming to agreement on sound principles of partnership. The record of the cities that have completely changed the basis of relations with their transportation companies is impressive, when consideration is given to the relatively short period in which strife, bickering and misunderstanding have given way to cordial and constructive co-operation. New York is the outstanding exception to what is rapidly becoming the general rule throughout the country, and present indications are that unless very material improvement is shown there soon the leading city of the country, in point of size and wealth, will be the last city of the country to apply intelligence and sound reason to the solution of its transportation problems. That the country's metropolis is paying a staggering price for its orgy of political nonsense is evident even to the most casual observer. Just how long intelligent business men and civic leaders of that city, to say nothing of the long-suffering public itself, will continue to put up with political expedients that are economic absurdities is an interesting test of human endurance and patience.

The record of important cities in which there has been an almost complete reversal of fundamental franchise conditions during only the last few years is a long one. Just a few will suffice to indicate the extent of this fundamental improvement, which now awaits only the spark of an increased riding habit to put the industry into a definite boom period. Pittsburgh, Cincinnati and Kansas City illustrate the point I am making. Stagnation,

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Ideal of Perfect Service?

bankruptcy and chaos have given way in those cities to sound franchise conditions, public partnership and orderly improvement. There are many other similar examples, but these will suffice as typical. In two other large cities conditions are still unsettled, but an intelligent effort is being made to find a solution and there is little doubt that these two important communities will soon join the other cities that have definitely started on the road to progress. New York lags behind the entire country.

Much has been said about the mutual interests of communities and their transportation companies. Two things have been definitely established in this country: First, the absolute dependence of communities upon efficient transportation as a necessity to their existence and continued growth; second, that though privately financed and operated transportation companies have made mistakes and have not always used proper foresight in shaping their relations with their passengers and with the communities they serve, public ownership, in the few isolated cases where it has been tried, has shown no improvement whatsoever, and escapes complete chaos and stagnation only in so far as it retains some of the characteristics of private management and a personnel trained under private initiative instead of political chicanery and "buck passing."

The man on the street has a better understanding today of the fact that efficient, reliable and comfortable service are dependent on making the conditions of partnership between company and city such that the transportation company can remain solvent and be able to finance improvements and extensions needed to keep up with a city's changing requirements and growth. But our industry has in a sense marked time during the past few years, while this necessary change in public attitude was developing. In the meantime the automobile made such strides in popularity that though the industry now stands on a better foundation of public understanding, there is much work to be done in making up lost time in winning increased patronage by application of modern merchandising methods.

The industry will fulfill its destiny only as it rises above the conception that the transportation executive's task is merely the efficient operation of cars and buses. Under today's conditions it is far more than that. The vision of our executives must transcend the limits of a strictly company viewpoint. They must come to see clearly that the greatest service to their companies will be rendered through an understanding of the community's needs. From this will grow a broader conception of the entire community transport problem. It will ripen into new public confidence and real community co-operation.

Traffic congestion continues to be a baffling problem. Business men and politicians alike have been almost helpless in coping with it. Real leadership in showing the way to traffic relief will win for our industry a degree of public good will that will in turn bring inevitable success. But that leadership can be won only by demonstrated sincerity of purpose. This must be supported by expert knowledge of traffic matters, not only as they apply to public transportation companies, but also as they affect all users of the public highways.

In the increased use of public transportation and decreased indulgence in the luxury of individual transportation lies the logical solution of traffic congestion. But to bring this about there is one requirement of paramount importance. The character of public service must be brought as nearly to the level of that provided by the individual vehicle as is physically and economically possible. Only then can the public at large be expected to understand fully the importance of fostering the development of the best possible public transportation service. Transportation men must have as their objective the ideal of perfect transportation service. Each type of vehicle which is found suitable for rounding out this service in the best interest of the community should be developed and applied to the limit of its possibilities. The commutation service of railroads, rapid transit lines, large cars and trains for trunk lines on the surface, lighter cars in smaller communities and less densely populated territory, various types of buses for the classes of service in which they are most suitable, and perhaps taxicabs as well, should all form part of a city's co-ordinated transportation service. These various classes of service and different kinds of vehicles should be operated in the interest of giving maximum usefulness of existing street facilities. In fact, there seems no good reason why the movement of freight and commodities over city streets should not likewise be co-ordinated with the movement of passengers in the interests of bringing about maximum street usefulness with minimum interference and waste. All of these factors, to my mind, should be considered in the broad problem of meeting today's demand for better transportation.

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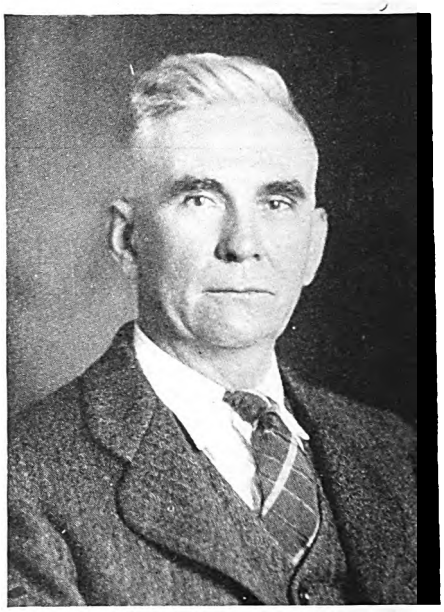
Prize Winners in ELECTRIC RAILWAY

FIRST Capital Prize of $200 awarded to James A. Duffy, superintendent of equipment Monongahela West Penn Public Service Company. Second Prize of $100 goes to Joseph Mercier, general foreman of the track service division, Montreal Tramways. Third Prize of $50 was awarded to Charles Herms, general foreman San Diego Electric Railway, and a Fourth Prize of $25 was given to E. M. Miley of the Chicago Surface Lines. Prize-winning articles are published on pages 532 and 533 of this issue



James A. Duffy, the winner of the first capital prize and the monthly prize for August in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest, is superintendent of equipment for the Monongahela West Penn Public Service Company with headquarters at Fairmont, W. Va. Since 1919 he has been in this position, to which he came from the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, where he was master mechanic for seven years. Mr. Duffy was also master mechanic of the second division north side shops of the Pittsburgh Railways for seven years.

He is a Pennsylvanian by birth and was educated in the schools of Fayette and Jefferson Counties. His first experience was in the coal mines in Pennsylvania, where he was engaged in installing electrical mining machinery.

Mr. Duffy has had considerable power plant experience in addition to his railway equipment work. He was with the Duquesne Traction Company, Pittsburgh, and later with the Fifth Avenue Traction Company of that city, where he served as power house engineer. Later he was made assistant chief engineer of the company's power plant. In 1899 Mr. Duffy went to the Havana Electric Railway, Havana, Cuba. There he was engaged in constructing power plants, overhead lines and equipping the street cars of that company.

EQUIPMENT arranged for building up the treads and flanges of car wheels by electric welding with provision for grinding the wheels to proper contour at the same time was awarded the first capital prize of $200 in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest. This item also received the monthly prize of $25 for August. This equipment is used in the Fairmont, W. Va., shops of the Monongahela West Penn Public Service Company, and a description of the equipment, together with its economies, was submitted in the contest by J. A. Duffy, superintendent of equipment for that company.

Wheel work constitutes one of the principal maintenance operations on any electric railway system. The turning of steel wheels to provide a proper tread and flange contour when these become worn and the grinding of cast-iron wheels to get rid of flat spots have long been universal practice. The building up of the treads and flanges when they become worn by applying metal through the electric welding process is a more recent development. Many city properties are using this with satisfactory results and with desirable economies. Few high-speed interurban roads, however, have adopted the process because of a feeling that there might be danger of a derailment should the welding prove defective. The Monongahela West Penn Public Service Company operates interurban service through a number of towns in West Virginia and Ohio and the restoring of treads and flanges by automatic electric welding is used. To save time and labor the special equipment described in the article was devised so that one wheel is ground while the other wheel is being built up by electric welding. Provision was made for driving the wheels at a speed desirable for the welding operation through gearing attached to the center of the axle, and a variable speed motor with proper control provides for variations in peripheral speed of from 5 to 13 in. per minute. The automatic welder is of standard manufacture and convenient mounting is attached as part of the equipment. The grinding wheel is driven by a separate electric motor.

This method of grinding and welding has eliminated the use of a wheel lathe and a saving of about three hours per pair of wheels in machinist's time has resulted. With this equipment the welder can do other kinds of hand welding at the same time that he is overseeing the wheel welding by the automatic head. The judges considered that this method provided for a decided saving in labor and expense in one of the most frequently occurring maintenance jobs with which electric railways are confronted.

A quick release latch for a hacksaw blade as submitted by Joseph Mercier of the Montreal Tramways was awarded the second capital prize of $100. This equipment is extremely simple, but fills a long-felt want in making it possible to remove the frame of the hacksaw quickly when a car approaches. This obviates the necessity of removing the blade from the rail, which frequently results in

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JOURNAL *Maintenance Contest*

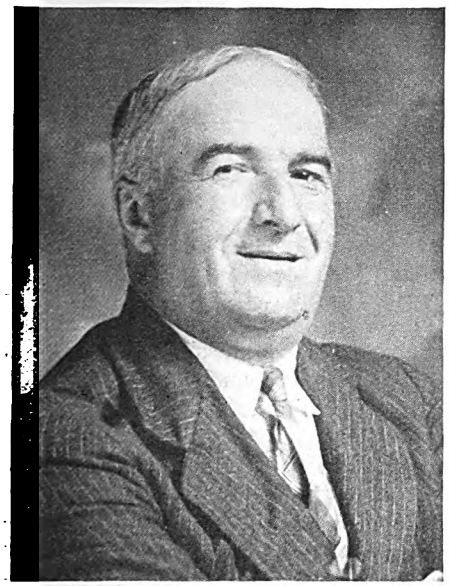
breakage. This equipment provides a rigid hacksaw blade for doing the work and an instant release so that the blade can be left in the rail provided it will clear the wheel flange.

The third capital prize of $50 in the Maintenance Contest went to Charles Herms, general foreman San Diego Electric Railway, for an adjustable mandrel to be used in babbitting journal brasses. This is the second prize that has been won by Mr. Herms in the Maintenance Contest, as he was awarded the monthly prize for June for a spacing attachment used with a commutator slotting machine. The babbitting mandrel described by Mr. Herms is arranged so that different types of journal brasses can be poured on the same mandrel while securing perfect alignment with the axle and journal box. Side adjusting plates can be put in position quickly and so the time for the operation of babbitting is reduced considerably.

In previous announcements in the JOURNAL provision was made for but three capital prizes. In going over the large number of manuscripts submitted, however, it was found desirable to add a fourth prize of $25 to the list for honorable mention in the articles considered for the capital prizes. This fourth prize goes to E. M. Miley of the electrical department of the Chicago Surface Lines for his description of the method used by that railway in reclaiming steel trolley poles by electric welding. With this method some 900 poles have been reclaimed, which has resulted in a saving of approximately $27,000 from the cost of new poles. The method is also used for reinforcing poles while they are standing in the street under load. It should prove a valuable maintenance practice for adoption by other railways.

The equipment used for grinding and welding wheels at the same time was described in the Aug. 20 issue of ELECTRIC RAILWAY JOURNAL and was awarded the August monthly prize.

Honorable mention for August was awarded to Charles Herms of the San Diego Electric Railway for his description of an air clamp for drill press.



Joseph Mercier, the superintendent of the track service division for the Montreal Tramways, Montreal, Canada, was the winner of the second capital prize in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest. He was born in New York State and began his electric railway service with the old Montreal Street Railway, now the Montreal Tramways. He has been in charge of the track service division since May, 1916. This division includes a machine and frog shop, where welding, grinding and similar work are carried on. In addition, a large amount of track repair equipment is maintained, such as bonding apparatus, crane cars, concrete mixers, tie tampers, concrete breakers, steam rollers, and other similar equipment used in the track construction department.

Charles Herms, who won the third capital prize, is shop foreman of the San Diego Electric Railway. He has been with that company since 1923. He began his electric railway experience in 1919 with the San Antonio Public Service Company in Texas as general repair man and continued in this capacity for four years, when he was promoted to foreman over a crew engaged in remodeling cars.

Mr. Herms has always been interested in mechanical construction. During the war he was attached to the First Army headquarters in a motor repair unit. Other experience outside of the electric railway field includes supervision of the mill department of the San Antonio Portland Cement Company and a position with the Boston & Superior mine in Arizona to recondition the electric and telephone system of that company.

E. M. Miley, the winner of the fourth capital prize, is estimating engineer for the Chicago Surface Lines. He started work for the Western Electric Company in Chicago in 1902 in the power apparatus testing department and later was promoted to shop superintendent. In 1917 he took the position of chief electrician for Hillman's Department Store in Chicago and later went with the Northwestern Elevated Railway, now included in the Chicago Rapid Transit Company. His work there was on substation construction work. In 1908 he went with one of the Chicago railways now included in the Chicago Surface Lines.

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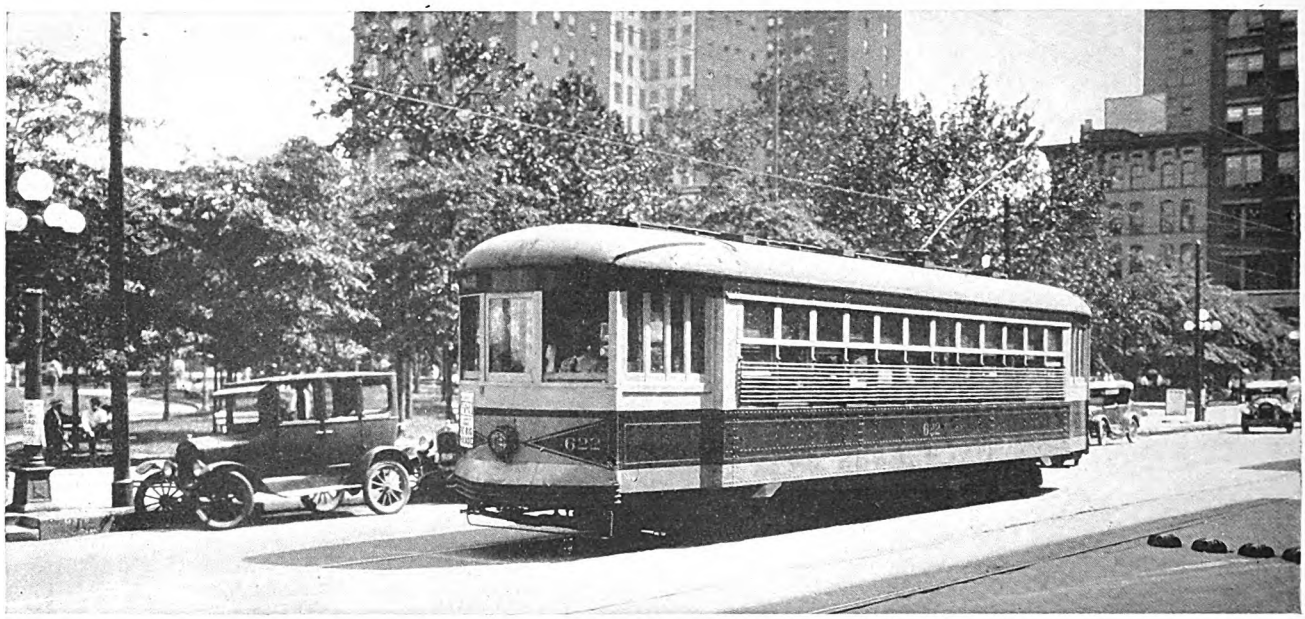
Modern Light-Weight Cars

Meet Transportation Demands of Medium-Sized Cities

By A. D. McWHORTER
General Superintendent Memphis Street Railway



Operation of rail coaches of this type has met with widespread public approval in Memphis, Tenn.

VERY different from its predecessor of a few years ago is the modern light-weight city car, with its arched roof, wide windows, metal sash, deep upholstered seats and up-to-date lighting fixtures. Practically every week for the past year we have read in the technical press of new light-weight cars being put in service in our medium-sized cities. Many of the installations have been accompanied by celebrations, historical pageants, bonfires, etc. The industry is making progress and putting up a winning fight to regain some of its lost business.

Evidence of this strong comeback is found in the wide distribution of the rehabilitation programs now under way or completed during the past few months. The trend toward light-weight, double-truck, one-man cars for cities of 100,000 to 500,000 population has been increasing rapidly for the past two years. The Memphis Street Railway is now operating 97 modern cars of this type. Atlanta, Birmingham, Dallas, New Orleans, Richmond and other Southern cities in the 100,000-500,000 class also have recently bought light-weight cars. In the North similar equipment has been purchased by the railways in Providence, Worcester, Springfield, Scranton, Grand Rapids, Youngstown, the Twin Cities, Milwaukee, and by the Eastern Massachusetts Street Railway. In other sections of the country the trend has been the same. The popularity of the light-weight double-truck car is everywhere evident, particularly in the cities of medium size, but also in those with a population of more than 500,000 and those with fewer than 100,000 inhabitants.

The story of the modernization of the rolling stock of the Memphis Street Railway is typical. In 1923 this company purchased 40 double-end, two-man, light-weight, low-level, double-truck cars, the first new equipment placed in service since 1914. They were built by the St. Louis Car Company, but sharpened ends characteristic of Memphis were retained in the design. These cars were converted last year for single-end, one-man operation. To augment and improve the service the company purchased 32 modern "electric rail coaches." The first of these went into service Aug. 11, marking an epoch in street railway transportation in Memphis.

The latest cars are of the one-man, low-level, light-weight, double-truck, semi-noiseless type. All passengers enter by the front door. White passengers leave by either the front or rear exits, while colored passengers leave by the rear exit only. Each car has 55 seats, upholstered in taupe plush, with Nachmann spring units. Mosaic rubber tile flooring, laid on a thick layer of celotex which covers a heavy wooden floor, helps to deaden any noise emanating from the trucks. An important feature is the artistic painting, "streamline effect," which gives an unusually attractive appearance.

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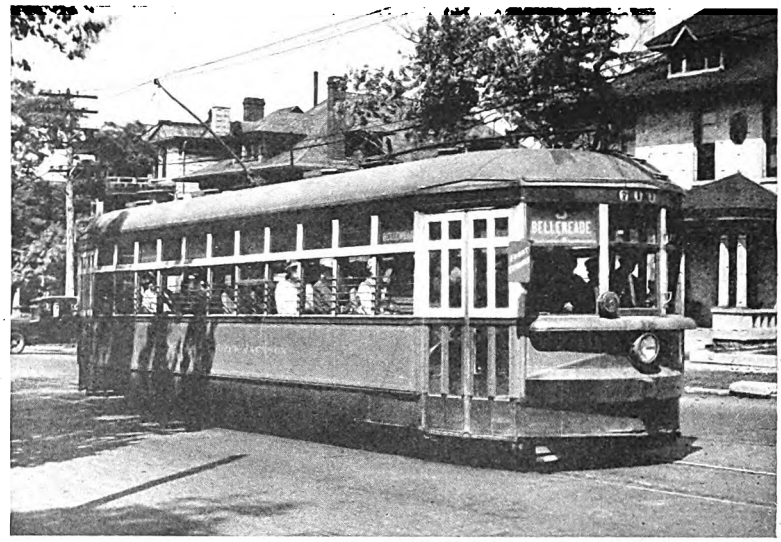
1923. Of this number 210 are of the light-weight, double-truck type designed for either one-man or two-man operation. Although it is difficult to estimate the savings in equipment, power and platform expense which may be credited to the new cars, there is no doubt that operating expenses have been reduced materially. It is even more significant that the gross revenue of the company has shown a substantial increase since 1923, as indicated below, despite a general business depression in this district. Expansion of bus service and fare increases undoubtedly have contributed to the gain in gross earnings, but improved car service has been an influential factor.



New light-weight cars of Nashville, Tenn., are named after prominent citizens of the state

Revenue of United Electric Railways of Providence

Year	Gross Earnings
1923	$8,006,202.21
1924	8,179,822.41
1925	8,159,446.59
1926	8,193,345.17

Other New England cities in the 100,000-500,000 population class which recently have bought light-weight, double-truck cars are Worcester and Springfield. A total of 100 new cars were ordered in the early part of this year by the management in charge of the railways in these two cities. The first of these cars began operation early in August of the present year. After the entire lot has been put in service it is planned to retire much of the older, heavier equipment. Similarly, the Eastern Massachusetts Street Railway recently bought 50 cars of the same general type for use in the industrial cities, such as Lawrence, Lowell and Fall River, which it serves.

In the North Central states the Milwaukee Electric Railway & Light Company has placed in service 40 modern, double-truck, light-weight cars, in which control apparatus and air piping are entirely inclosed in cabinets made of a metal-faced wood. This gives a light but strong construction which will not become dented or defaced as easily as wood and can be refinished readily. An opening provided between the two sections of the cabinet gives kneeroom for the operator. Interior trim is light cherry with a cream color ceiling. The exterior color scheme is orange and cream, the orange being placed in the panels below and above the windows with cream in between them to give a streamline effect. Aluminum fittings are used throughout for seats and handrails. Seat cushions and backs are upholstered in the customary rattan, which is covered with hair felt ½ in. thick, and a final cover of black Kemi-suede. The first cost of this seat is slightly higher, but it is claimed that its life is greatly increased.

The chief function of a railway company is to sell rides at a profit and success is dependent on creating demand through improvement of the product. Replacement of obsolete equipment is of paramount importance and should be given serious consideration. Application of the same principles that cause a merchant to pay careful attention to the appearance of his store will attract new business and make more friends for the railway. Modern cars attract greater patronage and earn more revenue than those of obsolete design.

While light-weight, double-truck cars of the type discussed lend themselves most admirably to service in cities of 100,000 to 500,000 population, they are in successful use in cities of more than 500,000 inhabitants. There are light-traffic lines even in the largest cities, and a double-truck car of medium size, economical to operate, is more efficient for this service than a bigger vehicle would be. Then, too, there are many routes where the traffic is fairly heavy in the smaller cities. The light-weight, double-truck car is well suited to such conditions.

Properly used it is an important factor in restoring the popularity of the electric railway.

Light-weight cars at Providence, R. I., have reduced operating costs and increased earnings

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Front-entrance, center-exit car of the United Railways, St. Louis, is well adapted for handling heavy loads

Heavy Traffic in Major Cities Demands

Large Double-Truck Cars

By R. J. Lockwood

Assistant Manager for Receiver United Railways of St. Louis

FROM the standpoint of the street railway operator the field of urban passenger transportation has become vastly more complex during the past few years. Not so long ago it consisted of subway, elevated, street car and suburban steam railroad services. In those days the street car operator was not confronted with the problem of serious competition, the field being somewhat distinctive. His concern was largely with the financial and engineering problems of increasing and extending his service to meet the expanding needs of growing communities. Today, however, his problems are more complicated as the forms of urban passenger service have increased until now they include subways and elevateds, large double-truck street cars, smaller one-man cars, double-deck buses, single-deck buses, taxicabs and, last but not least, private passenger automobiles. Each of these types of transportation undoubtedly has its own particular field, but actually they are not bound by exact economic limitations and in many instances their services overlap. Thus competition and unnecessary traffic congestion follow, with all their attendant ills. It is the purpose of this article to discuss the large double-truck street car and its field of operation and to touch upon other services only where comparison with the large car is needed.

Undoubtedly the large street car has a most useful field of operation, particularly in handling mass transportation in cities where the travel spreads out in many directions and does not follow a restricted line of flow, as in the Borough of Manhattan. Such a city, for instance, is St. Louis, containing in its metropolitan area about 100 square miles and a population of approximately 1,000,000. Other similar cities are Chicago, Philadelphia, Cleveland, Detroit, Baltimore and Cincinnati.

In St. Louis about 30 per cent of the population coming from the entire metropolitan area travels each day into the congested district, comprising an area about ½ mile square. Later each day the 30 per cent assembled in the congested district travel home again, their routes of departure radiating like the ribs of a fan. In addition to this, about the same number of people travel each day to and from various other points of the city. To handle such travel on subways would require the construction of so many miles of line that the proposition would be prohibitive in cost. Because of street traffic congestion in the central business district, it might be desirable to put the surface cars underground for relatively short distances, but present traffic at present fares does not furnish revenue enough to justify such a proce-

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Undoubtedly the gasoline vehicle has slowed up what used to be the normal yearly increase in street car travel. It has hurt railway pleasure travel more than business travel. This is indicated by the fact that in St. Louis week-day travel in 1926, compared to 1925, increased 0.18 per cent. Saturday travel decreased 0.16 per cent. Sunday travel decreased 2.35 per cent and other holiday travel decreased 2.42 per cent. Night travel on all days also fell off. The foregoing figures indicate beyond doubt that the greatest competitor of the street car is the privately owned automobile. Not only has the normal growth of the street car business been curtailed but the loss at periods when it is easiest to furnish transportation makes the problem even more serious.

Seventh and Broadway, Los Angeles, showing large cars used in city service

To meet present-day competition, whether from the bus or the private automobile, there are certain broad principles that the railway manager must adopt for his guidance. There are many little things which can be done with more or less success, such as publicity stunts, etc., but in the long run the fundamentals are:

Give as frequent service as revenue will permit.
Keep the cars on schedule and equally spaced.
So far as possible provide a seat for every passenger.
Establish as fast a schedule speed as possible with proper regard for safety.
Use plenty of paint to make the cars look attractive.
Keep the cars clean.

To accomplish these things is no easy task, because the street railways are a regulated industry and the public authorities controlling them have been slow to recognize their difficulties. Nevertheless progress has been made. The large double-truck street cars built 25 years ago were heavy and cumbersome. During the years 1903 and 1904 the St. Louis Transit Company and the St. Louis & Suburban Railway, predecessors of the United Railways, bought about 525 cars of this type. They are typical of many built in that period. Their principal characteristics are given in the table below, as well as those of 200 cars built by the United Railways from 1921 to 1923.

It is readily seen that the newer cars are much more efficient than those built twenty years before. In acceleration, in smooth running, in energy consumption, in weight per passenger and in convenience of loading and unloading they are far superior to the older cars.

	Cars Bought 1903-04		Cars Bought 1921-23
	St. Louis Transit Company	St. Louis & Suburban	United Railways
Length	46 ft. 2 in.	48 ft. 5 in.	50 ft. 6 in.
Weight	48,800 lb.	52,000 lb.	39,400 lb.
Seating capacity, passengers.	57	57	60
Standing capacity, passengers	60	50	60
Weight per seated passenger.	856 lb.	912 lb.	657 lb.
Weight per total passenger..	417 lb.	486 lb.	328 lb.
Kilowatt-hours per car-mile.	3.219	3.343	2.826
Motors	4–40 hp.	4–40 hp.	4–35 hp.
Diameter wheels	33-in.	33-in.	26-in.
Height of floor	39-in.	39-in.	31-in.

Data are available on 6,273 double-truck cars purchased by 55 companies since the World War. These

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figures are not so complete as those on the older and heavier cars, but they are interesting:

4,041 cars weigh less than 40,000 lb.
2,231 cars weigh more than 40,000 lb.
6,273 cars average 36,100 lb.
4,624 cars have wheels of 26-in. diameter

From these figures it will be seen that the typical modern car is a very different vehicle from that in use twenty years ago.

During the past two years certain radical departures from established practice have been made. At the Cleveland convention of the American Electric Railway Association in October, 1926, the Cleveland Railway exhibited an aluminum car which was 51 ft. long, weighed 30,000 lb. and seated 49, with standing room for 91 additional passengers. It is commonly believed that aluminum will soon come into more general use in car construction than at present. At Springfield, Mass., and at Joliet, Ill., two worm-drive cars are in service. These cars are light in weight and are somewhat experimental in their construction, in that the axles are those made by the Timken-Detroit Axle Company for heavy truck service and the motors used were designed and built for gas-electric bus service. Similar trucks have been ordered by St. Louis for one car, by Pittsburgh for two cars, by Detroit for one car and by Montreal for two cars. The St. Louis truck and probably the others will have rubber shock absorbers on the ends of the springs and a rubber insulation between the wheel center and tire, with connecting bonds to complete the electrical circuit to the track.

Advantages of these innovations are expected to be in smoother and quieter running of the car. Brake screech and clatter, wheel ring, journal box, gear pedestal and bolster noises, and general noises due to vibration, it is confidently expected, will be eliminated or much reduced. In St. Louis a special body is being built using aluminum to some extent. This car will have the load-carrying capacity of the front-entrance, center-exit car described earlier, but it is to weigh 5,000 lb. less. Thus by improvement in the design of large cars for heavy city traffic it is to be expected that a vehicle will be developed which will meet the demands of this kind of traffic and provide better and more attractive service than is being given at present.

According to the census of 1920 there were sixteen cities in the United States having populations in excess of 400,000. Several other cities were so near this figure that it is safe to say that there are now twenty cities in this class. They constitute the primary field for the operation of the large double-truck car. Of these cities, New York, Chicago, Philadelphia and Boston have more or less extensive rapid transit systems. But this has by no means eliminated the large car as a factor in their local transportation facilities. It is a fact not generally realized that surface cars are carrying more than 40 per cent of the total traffic in New York City, despite conditions that are more favorable than exist anywhere else for the development of rapid transit; large surface cars are used intensively also in Chicago, Philadelphia and Boston, and in the cities without rapid transit vehicles of this type are carrying the bulk of the traffic. In cities of less than 400,000 population the large double-truck car can sometimes be used to advantage on certain lines. Generally speaking, however, its field of greatest usefulness probably will be found in the twenty largest cities, particularly in those where geographical and other conditions are unfavorable to the development of extensive rapid transit systems.

Large surface cars play an important rôle in Philadelphia's transportation system

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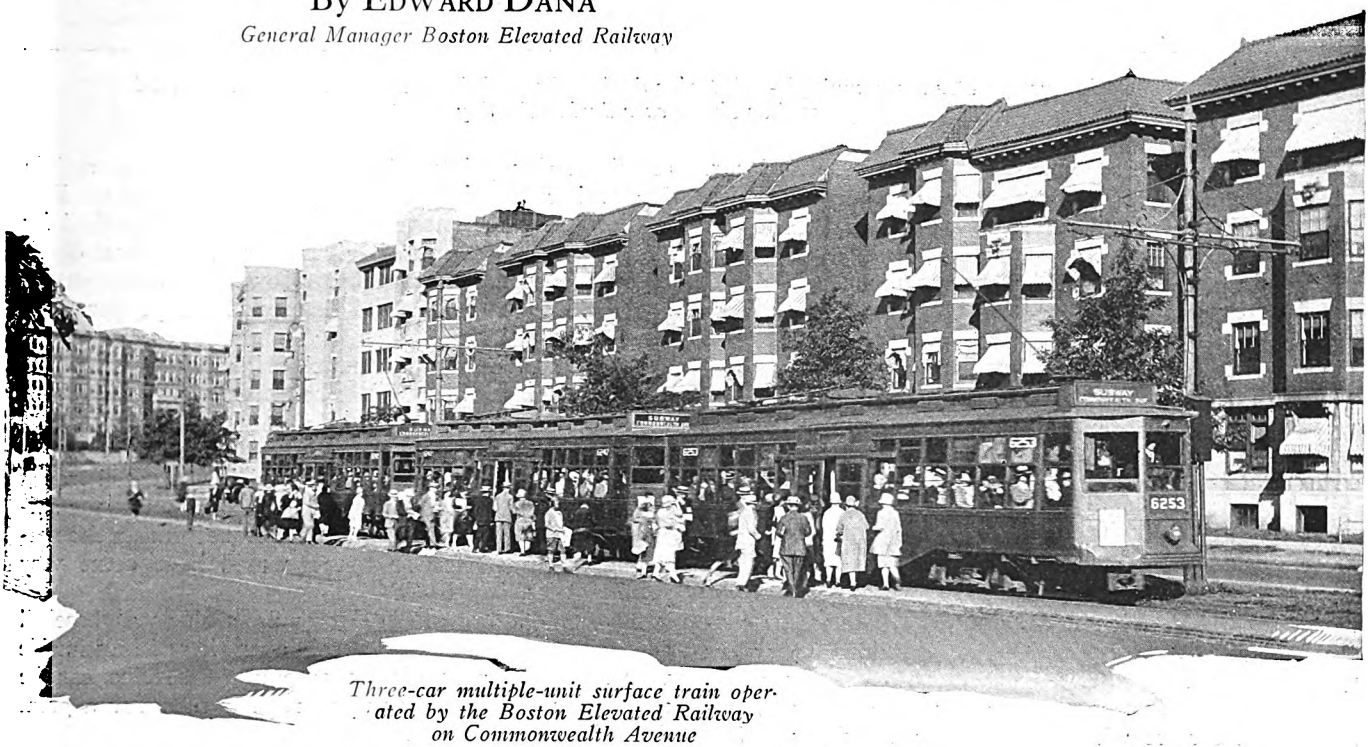
Congestion Demands Use of

Surface Line Trains

For Economy

By EDWARD DANA
General Manager Boston Elevated Railway



Three-car multiple-unit surface train operated by the Boston Elevated Railway on Commonwealth Avenue

SO MUCH has been said and written in recent years regarding theory and practice of surface-train line operation that the fundamental principles of success in this field are generally understood. The practice of adding cars to an operating unit to care for greater volume of traffic dates back to the beginning of large-scale transportation. Steam railroads have practiced it as far as possible, because with them each train unit requires a locomotive. Conditions are entirely different in street railway operation, but the same fundamental principle applies, namely, to furnish the desired service at a minimum of cost.

City surface-line operation is distinguished from others by certain characteristics, the main one being the interference of vehicular traffic with car movement. Another is the demand of patrons for frequent service, and a third is the relatively short distances between stops. All of these factors unite to render difficult the maintenance of uniform headways, particularly in rush hours. That is where the train helps to solve the problem.

The increasing use of trains of two or three cars in surface-line operation in large cities is due to the application of three general principles:

1. A train of cars permits more rapid operation through congested traffic than do separate cars. This follows because all of the cars in the train go through traffic as a single unit. Other vehicles can interfere less with a train than with a corresponding number of single units, and a single signal from a traffic officer insures passage of the entire train. The tendency of single units in heavy traffic is to bunch; in other words, they are forced to form what is essentially a train. This is a condition which suggests train operation.

2. When passenger traffic on a given line is sufficiently heavy to permit train operation without too great an increase in headway, trains can be operated at lower labor cost per car-mile than single units. One motorman operates a train of any desired length, hence the share of his wages chargeable against each car is inversely proportional to the number of cars in the train. This comparison is, of course, with two-man cars, which would usually be operated under traffic conditions favorable to train operation.

3. The train furnishes a flexible transportation unit, the capacity of which can be readily adjusted to service requirements. Whether trains consist of multiple-unit cars or motors and trailers, it is practicable to add or drop cars as the traffic demands and thus keep the equipment in service efficiently.

EXPERIENCE IN BOSTON

The first regular two-car train operation in Boston was inaugurated on May 24, 1915, on the line from Watertown to Park Street, although experiments along this line had been tried earlier, perhaps 25 years earlier. This method of operation was introduced to utilize in rush hours the greater carrying capacity of the train, with lower platform costs, on lines where the headway under train operation is not detrimental to the service. The first trains consisted of motor car and trailer, involving, of course, provision for looping trains at the terminus of the line and ample kick-off tracks for the storage of the trailers. The arrangement offered opportunity to purchase equipment at minimum expense, because the trailer is so much lighter and, being without

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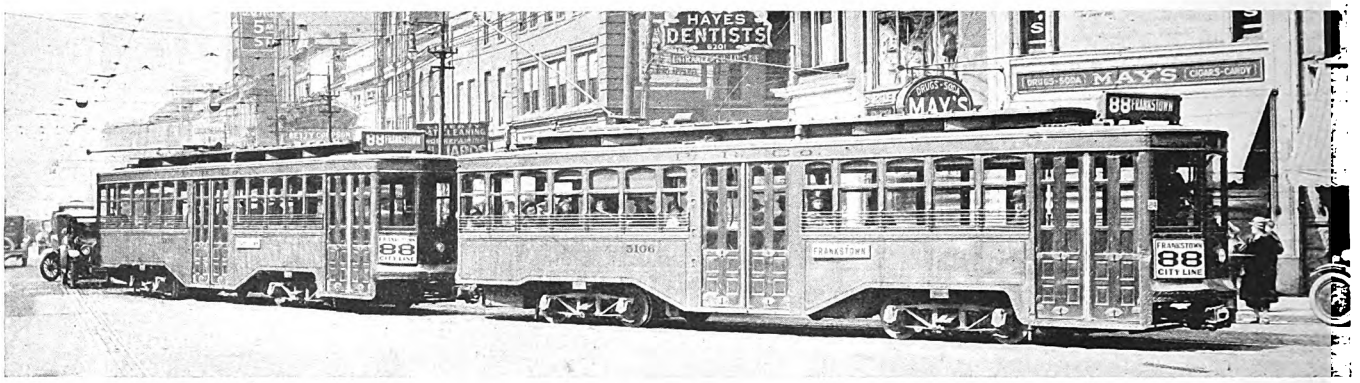


Pittsburgh Railways operates many multiple-unit trains during the rush hours. These are disconnected and operated as single cars during the day

motors, so much less expensive than the forward car. It so happened that by slight changes in motor cars which had not originally been purchased to haul trailers it was possible to introduce train operation without expensive changes in our so-called No. 4 type motor car.

At the present time there are 220 trailers on the Boston Elevated system operated on fourteen lines. Shortly after the successful installation of train units the center-entrance multiple-unit car was introduced and today there are 190 of them on the system, running as trains in two or three-car lengths on eight lines. Experience with center-entrance multiple-unit train operation has shown that dead mileage can be reduced to a minimum by trains that can be turned back on crossovers, not requiring the expense of installation of loops or the operation of the two-car units to the end of the line.

Recently on a heavy crosstown line where traffic congestion had become so extreme that individual cars were running practically in trains the introduction of two-car train rush-hour service has equalized the load and improved the service without seriously impairing the frequency of the service. Conditions at the Park Street loop of the Boylston Street subway, a heavy main artery, are such as practically to demand rapid transit operation. A close approach to this could be obtained only by two and three-car trains. During the rush hours all lines passing through this tube are operated in either two or three-car-train units, which makes it possible to pass a greater number of cars through Park Street station than would be possible with individual units and individual operators.

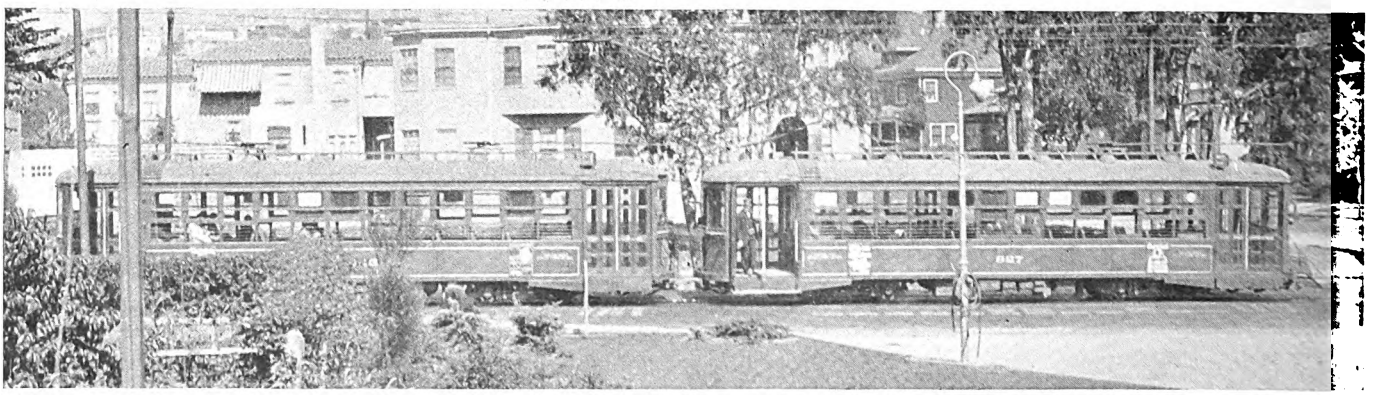
Under favorable conditions it ought to be possible to utilize multiple-unit trains somewhat after the fashion of steam railroad operation, where cars are picked up at certain major points. This has not yet been tried in Boston because of the relatively short length of the lines leading to rapid transit terminals, but there is a field for such operation, because it gives most economical distribution of the seating capacity. However, careful studies are required in advance to determine the proper fields for it.

After the East Boston tunnel, originally built for surface car operation, reached its saturation point with single units, it was speeded up materially by the introduction of surface-car multiple-unit trains. After again reaching its saturation point it was converted into a rapid transit steel-train line. Had it not been possible to use the surface-line trains the expenditure for transforming the tunnel into a rapid transit tunnel would have come very much earlier than it did.

In the handling of large crowds, such as at baseball games and circuses, we find train operation of inestimable value, because a maximum amount of service can be rendered without calling upon regular men for a great deal of overtime work.

It is easy to go too far in the extension of train operation, because headways can become too long if a certain economic limit is exceeded. Just what this limitation is depends largely on local conditions and must be determined on the basis of accurate traffic studies. Patrons are entitled to a certain frequency of service, which of course depends in part on the business handled by the line. Sometimes, however, service must be given locally at a loss in order to insure reasonable standards.

In considering train operation, it is necessary first to determine the loads carefully. For purposes of comparison several sets of data must be worked out to calculate



Train operation has been found to have many advantages on the lines of the Key System Transit Company

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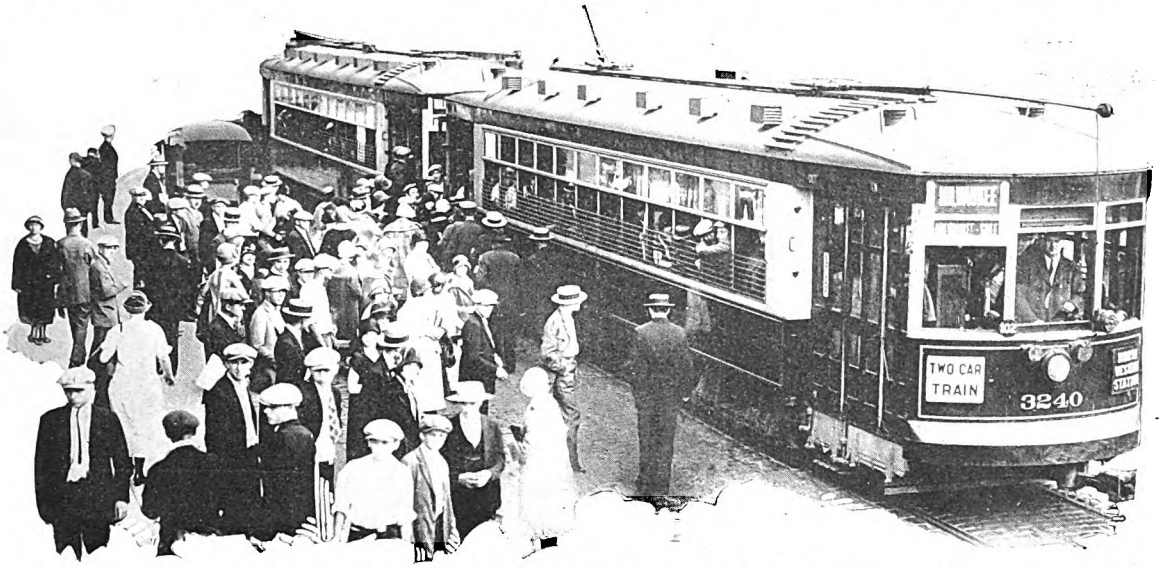
suitable headways with single-unit operation, with various combinations of short-line service, partly with trailers and partly with single cars, and with various train combinations, covering the entire length of the line. It is surprising to note from any set of traffic load figures the number of variations which must be studied before a final decision can be made. Such determination includes the best arrangement of train operation, if such operation is justified at all. In this connection the probable change in the complexion of the line must be given very careful consideration, because if the center of gravity of traffic should change by even ½ mile the relative values of these various combinations would be quite different.

While our experience in Boston may be considered typical, other localities have different conditions which affect the use of trains. In the preparation of this article valuable co-operation has been received from several managers and their experience will be summarized briefly:



Chicago Surface Lines has found the reversible feature of multiple-unit trains to be of great advantage

At Baltimore the United Railways & Electric Company has 62 cars equipped for multiple-unit train service. Practically all of these cars are of the "pay-enter" type, operated on the high-speed Sparrows Point-Bay Shore Park line. Peak-hour service on this line is nearly all given with two or three-car trains, made up in various combinations, i.e., one motor car and one trailer, two motor cars, two motor cars and one trailer, or three motor cars. The line is double-track, 16 miles long, largely on private right-of-way, with three fare zones. The company considers this one of its most successful lines.

The company also operates motor car and trailer trains on six one-fare city lines. Trailers are operated only in the morning and evening peak hours. At first the motor cars were underpowered, but early this year they were completely remotored, with four 65 or 67-hp. motors each. This operation is now entirely successful. The company owns a total of 100 trailers.

Saving of labor is considered to be the main advantage of train operation, but incidentally there are also savings in power and in accident costs. There is an increase in track capacity because automobiles cannot get between cars of a train. In congested districts service is speeded up because the entire train can proceed past a traffic signal after the front end of a train receives a "go" signal, regardless of whether changes are made in the "stop" position or not. The "skip-stop" has been helpful in connection with train operation. To secure equal loading of the cars of a trailer train, as is secured on the articulated units, remains somewhat of a problem.

This company also uses 24 cars permanently coupled to form twelve two-car trains. This is an economical arrangement from the standpoint of equipment, but the company has been so successful with its articulated trains, with their lower platform labor costs, that no more trains of this type will be built.

The Key System Transit Company at Oakland, Cal., operates three distinct classes of service involving trains, namely, motor-trailer operation, multiple-unit street railway two-car trains and multiple-unit trunk-line trains. The first of these is not entirely satisfactory, requiring a wye or loop at the end of a line and lacking flexibility in coupling up and cutting off. It is not conducive to making as good time as is secured with the multiple-unit trains. Local interurban service is furnished with one and two-car units built up and cut down to meet the requirements of traffic during rush hours. The cars are equipped with automatic couplers. The trunk-line service consists of trains of one to thirteen cars with automatic couplers, built up and cut off to meet the requirements. They are operated intact over the trunk line and cut at three points beyond it. The first section is operated express, the second is diverted to another route and the third furnishes a local service over the route traversed by the express. Cuts are made while the train is in operation without loss of time. On the trunk line the company is operating as many sections as can be accommodated, hence it is necessary to operate trains intact over that section and cut them after they branch off.

Experience on this system shows that train operation reduces accidents, eliminates congestion in streets, decreases man power with the same carrying capacity and is convenient, expeditious and flexible. The use of automatic coupling is an important feature in operation on this system.

Multiple-unit trains are operated on only one line by the Cleveland Railway—a rapid-transit line built into an outlying residential section. This type of operation

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gives more rapid acceleration than is possible with trailer trains and there is smoother operation. For this service 25 cars were rebuilt for multiple-unit operation and geared for about 40 m.p.h. They are operated singly and in two and three-car trains.

Trailer trains are operated extensively in Cleveland, all motor cars being equipped with four 40-hp. motors. This equipment is not too large for single-car operation and is sufficient for train operation during the rush hours. Cleveland is very flat and there is little overheating of the motors during the few hours of trailer operation. The motor cars weigh 22½ tons and the trailers 13 tons. At present in the evening rush hours a maximum of 792 cars and 432 trailers are scheduled. All heavy lines operate trailers morning and evening, the duration depending on the length of the line and the loading characteristics. On the Euclid Avenue line, the heaviest of the system, trains are operated all day, but even here there is no danger of overheating of the motors. This company favors trailer trains because the investment idle eighteen to twenty hours a day is less.

On account of the short, narrow streets in Pittsburgh and lack of elevated or subway facilities the trains are made up of but two cars. These are operated only during the morning and evening peak hours, excepting Saturdays and holidays, when they are operated for periods of ten or twelve hours. Three kinds of trailers are used by this company in making up trains, namely, multiple unit, motorized and non-motorized. The multiple-unit cars contain four 37½-hp. motors each. The motorized trailer, which cannot be operated as an individual car, has two motors of 33 hp. each, and it can be operated only with a certain type of car containing four motors of 37½ hp. each. When the two cars are connected they are known as a six-motor train. The dead trailer is operated only with a certain large and heavy type of car having four motors of from 60 to 75 hp. capacity each.

Of the 1,426 passenger cars in operation 155 are dead trailers, 380 are equipped to haul trailers, 160 are multiple-unit cars, 70 are trailers with two motors and 88 are six-motor-train motor cars. The remaining 573 cars include one-man and others that operate singly. Of this equipment the dead trailer is the least satisfactory and it is the intention of the management eventually to motorize all trailers. The operation is jerky and the large and heavy cars equipped with oversize motors necessary to haul the trailers are uneconomical. Since the trailer is used only four or five hours a day ordinarily, the operation of these heavy cars during the base schedule hours is costly.

The multiple-unit train has the advantage of greater acceleration on grades, which is important in Pittsburgh, where a few of the grades are as steep as 10 to 12 per cent. In such districts the multiple-unit equipment is the only kind that would stand up for a long period. The ability of the multiple-unit equipment to operate for a longer period without harm to the motor is an important one. It is also more flexible, a good operating feature around the carhouses, as it can be shifted under its own power. As trains are made up and disconnected twice a day, this is an important consideration.

On the Euclid Avenue route, which is the heaviest in Cleveland, trailer trains are operated throughout the day

Offsetting the disadvantages of train operation, i.e., longer headway, delay in getting starting signals to motormen and longer headways than with single cars, all of which are relatively insignificant, the Pittsburgh Railways finds, among the advantages of trains, smooth and comfortable operation, ability to handle surging crowds and smaller labor costs. As to types of trains, the multiple-unit type gives more service, is more durable and produces better acceleration.

The Chicago Surface Lines has 66 multiple-unit trains in operation on four heavy traffic routes and 95 trailer trains on three other similar routes. An advantage of the multiple-unit trains of special value in Chicago is that they are reversible at any point on the route, which minimizes interruption to service on account of fires, blockades, etc. A disadvantage is that the jumpers must be cared for when trains are disconnected on the street.

With trains composed of a motor car and center-entrance trailer it has been found in Chicago that there is difficulty in splitting up the load, as compared with the loading of multiple-unit trains where both cars are motor

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cars and the loading is all done at the center of the train.

The San Diego Electric Railway operates multiple-unit trains in all scheduled runs on three suburban lines, operating on common track to a junction point 7 miles from the center of the city. Here the rear car is cut off and takes a branchoff, the second car being dropped at a junction point farther out. The remaining car continues to the end of the line. The three cars of a train are designated by three route numbers. The crew of the first car comprises a motorman and a conductor. On the second and third cars are conductors, who merely collect fares as the train is operating as a whole in either direction. Beyond the junction point the men on the second and third cars operate merely as motormen, not having to bother with fares.

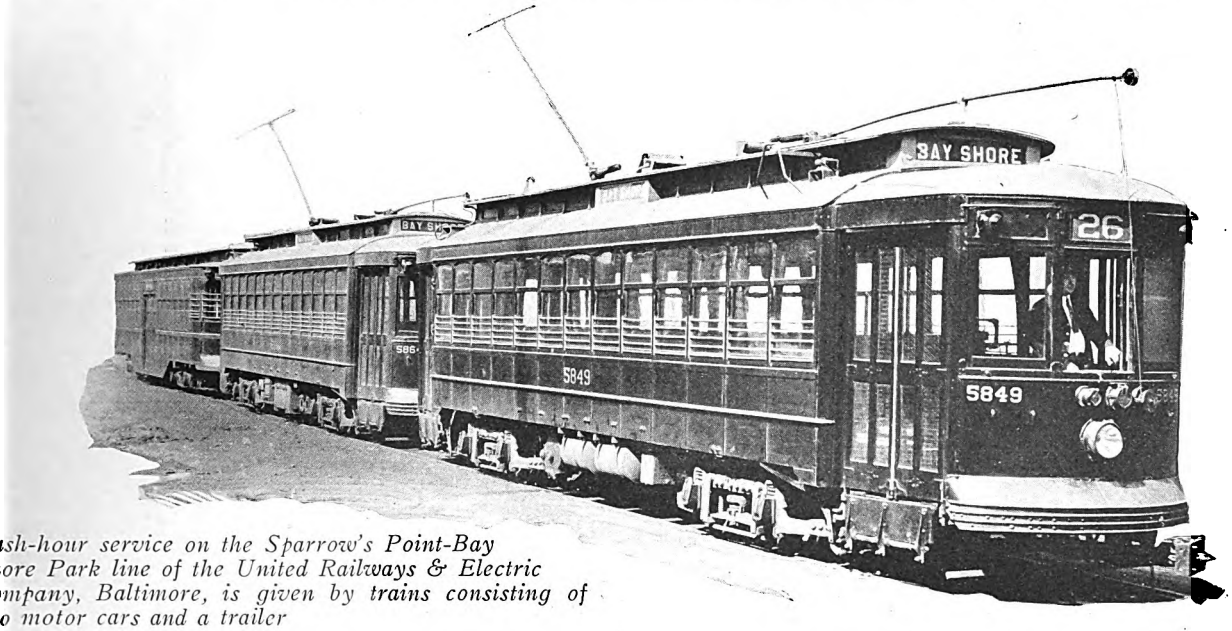
Due to the use of automatic couplers, little time is required to make up or break trains at junction points, this being done in less time than is necessary to handle the passengers at these points. The coupling equipment is so arranged that it will make or break two air lines (main reservoir and brake), the bus, control and signal lines, all through the use of a push button at the motorman's position on the car. With this equipment a following car can be dropped under way, while in making up a train the mechanical connections are made by impact and the push-button connection performs the other operations. During periods of specially heavy traffic trains up to six cars are operated on this line to three beach resorts, the trains being made up and broken into groups for the several beaches.

San Diego is laid out with short blocks in the city proper, so that the congested area presents unusual traffic problems. With train operation better use can be made of the track due to the less space required as compared with single units and the better speed due to the grouping of units.

Experience in San Diego shows that for city service multiple-unit control is most desirable and successful when the equipment is such that the making and breaking of trains can be accomplished with a minimum loss of time; that is, by full automatic operation. Equipment requiring two jumpers for electrical connection between cars, previously used, caused considerable delay and car trouble.

Taking into consideration the experience of these various railways it is possible to make a few general statements which epitomize the whole problem of surface-line operation. When traffic has reached such proportions that all efforts to meet it adequately by short-lining routes has resulted in track saturation which is impairing the efficiency of the service as a whole, then train operation demands attention.

Train operation cannot be considered, *per se,* as an economical move. The problem is more fundamental than merely securing economy of platform cost. Train operation should not be embarked upon without a careful study of all possible alternatives, such as rerouting or distribution through other channels of the traffic load involved. The introduction and the distribution of such service must be determined by the character of the traffic handled and the work to be performed. Moreover, train operation on an all-surface-line system is markedly different from that on a system that has a backbone of rapid transit service or subways.



Rush-hour service on the Sparrow's Point-Bay Shore Park line of the United Railways & Electric Company, Baltimore, is given by trains consisting of two motor cars and a trailer

The manager who has finally decided upon the use of trains confronts the problem: Shall the trains consist of motor cars and trailers or shall multiple-unit equipment be used? In favor of the former are simplicity and lower equipment cost. In favor of multiple-unit equipment are greater traction and greater flexibility. There is no question about the greater flexibility of the multiple-unit train in its ability to meet varying traffic conditions and in the ease with which it can be modified as conditions change. The choice as between trailers and multiple-unit cars largely depends on original costs, the possibility of utilizing older equipment as trailers and whether the line under consideration is of major or secondary importance.

On main lines, with the possibility of operation in subways, our experience would favor multiple-unit train operation. On the other hand, on short lines of less importance the operating economies and lower first cost make it possible to adopt train operation with trailers where multiple-unit operation would not be justified. Accident hazards with trains are less than with single units, because the smaller the number of individual operating drivers, the more concentrated is the responsibility and the less the likelihood of collision and other accidents.

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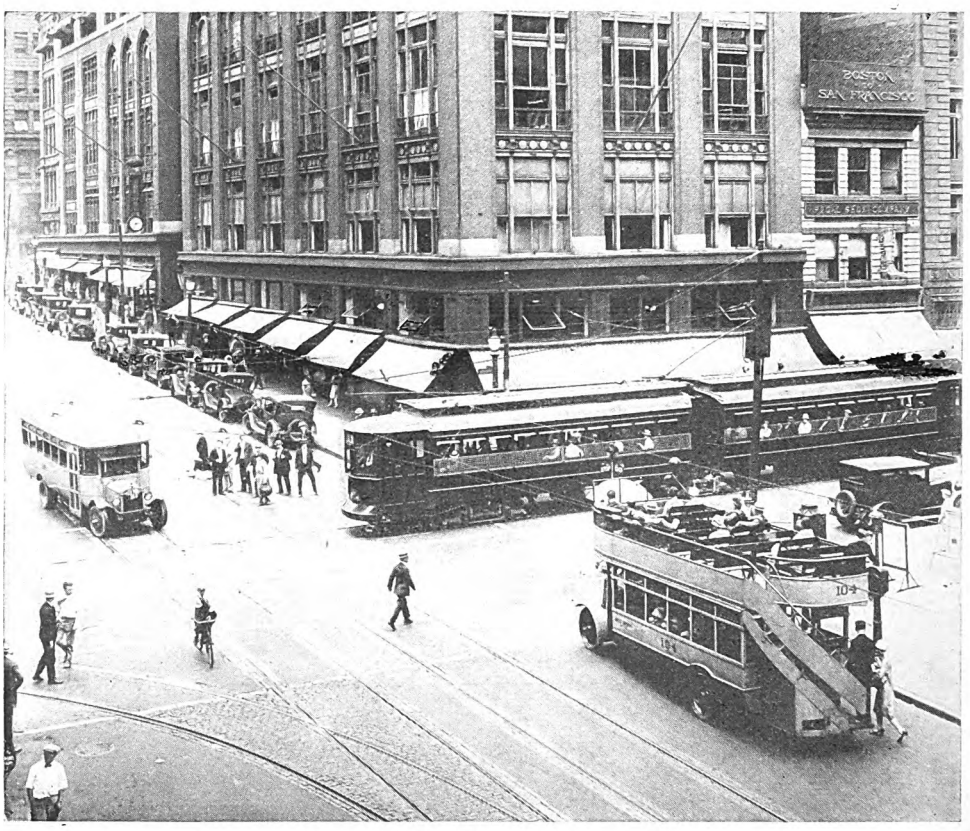

Articulated units have proved economical in city service in Baltimore

Articulated Units

Are Useful for Mass Transportation

By S. E. EMMONS

Assistant General Manager
United Railways & Electric Company, Baltimore, Md.

IN THIS and other countries the cost of operating electric railways has been increasing so rapidly that every endeavor to increase sales and to reduce operating expenditure has deserved careful consideration. The dead weight per seat of modern cars is large, and any considerable reduction is of the utmost importance. The usual practice of employing two four-wheel trucks per car involves considerable unnecessary weight when the units are used for train formation. It was this fact that led car designers to develop the articulated principle of serving two adjacent car ends with one truck. Results have been extremely satisfactory, a saving of from 10 to 14 per cent being effected in two, three and four-car units, and savings of more than 20 per cent being obtained on the larger assemblages.

Articulated units have five distinct advantages: (1) Reduced first cost; (2) reduced weight; (3) reduced operating costs; (4) improved riding qualities, and (5) simpler electrical construction.

First cost is reduced because of the need for less equipment—trucks, couplers and other costly parts. With fewer trucks the construction is simpler, and this, too, reduces the first cost. Reduction in weight is effected by employing fewer trucks and other equipment and in doing away with vestibules at the adjacent ends of the cars in an articulated train. The saving of weight per passenger amounts to more than 20 per cent in some trains. Operating cost is reduced considerably because fewer men are required to operate an articulated train and the energy consumption is much less. Two cars, not joined, would require two men each, or a total of four men. The same two cars if articulated could be operated by two men, or just half the other number. With less weight and fewer trucks and other equipment, maintenance costs are certain to be lower, not only on the cars but on the track as well.

Improvement in riding qualities is very marked due to the fact that there is no overhang of the bodies beyond

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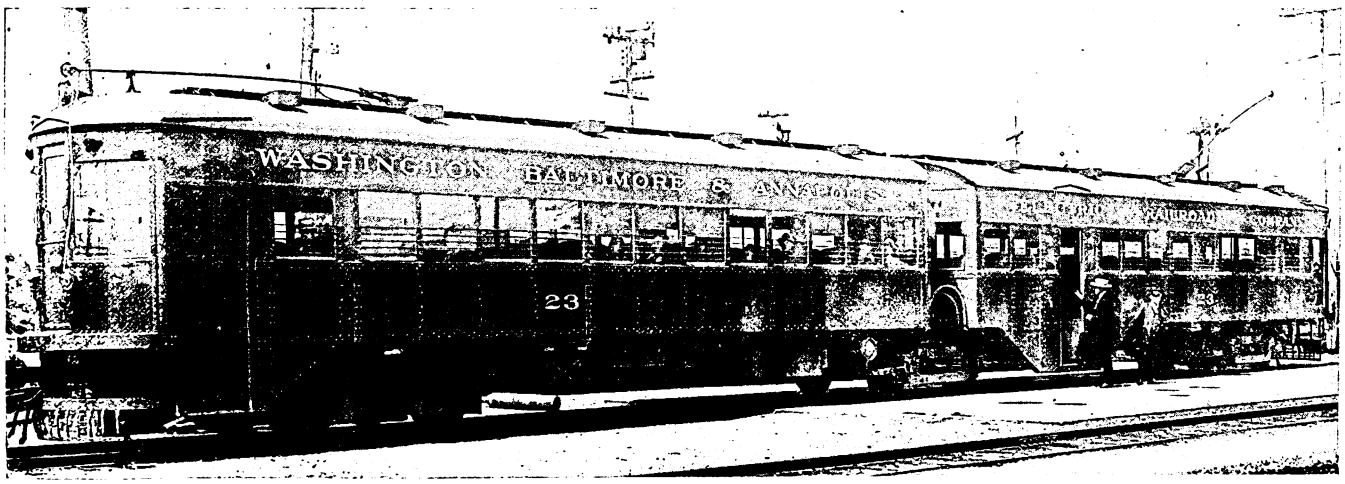
the trucks, the adjacent ends of each body being carried on one truck center. The most comfortable part of an ordinary car body is that situated midway between the truck centers, there being a minimum amount of lateral movement when entering curves and passing over crossings. The greatest lateral movement is felt at the ends of the body overhanging the trucks. In articulated units there is no overhang. The tendency of ordinary coupled cars to "roll" is often noticeable. This is absolutely impossible where the two ends are pivoted on one truck. Nosing, an annoying feature of double-truck cars in a train, is reduced when the articulated principle is employed. The bodies do not wander from side to side, but follow the true center line of the track. Better interconnection of passengers is made possible by the cylinder-type vestibule used. Better location of electrical control is made possible in the combined units, and wire connections are much simpler.

Although articulated units have many advantages, there is one serious objection to their use on surface



Washington, Baltimore & Annapolis Electric Railroad finds articulated units extremely satisfactory for interurban service

lines. Traffic in most cities does not warrant the use of such large units except during rush hours. The articulated units are not so flexible as are the double-truck cars designed for multiple-unit operation. Were it possible to fill all the available space of the cars during a larger portion of the day, the problem would be solved. However, such units have been used in a number of the larger cities and in most cases have proved to be a success.

Articulated surface car operation has been carried farther in Baltimore than in any other American city. The transportation problem there, since the war, has been typical of all our large cities. Wages and material costs have risen, traffic congestion has become increasingly more serious, people have moved farther away from the business center, and the competition of private automobiles has made heavy inroads on off-peak traffic. The elimination of "all day" parking downtown has only served to increase the difficulty, as these people have been thrown back on the street cars in the peak hours, and the parking places left vacant by them have attracted persons traveling in off-peak hours who formerly used the cars, with the result that there is an increasing demand for peak-hour service, with a marked falling off in off-peak traffic.

All of these factors have increased the cost of street railway operation to a point far beyond pre-war or even war-time figures; so that, even with increased rates of fare, it is no longer possible to operate on the pre-war basis. All street railway companies have been searching for the means whereby they can offset these mounting costs, and we find such changes as one-man car operation, train operation, rerouting, skip stops, lightweight cars, etc., almost universally adopted.

The United Railways & Electric Company of Baltimore met the situation in the usual manner, with the operation of one-man cars on several lines, extensive trailer operation, multiple-unit train operation, etc., and was successful in stemming the first tide of rising costs. However, expenses still continued to mount, and it became imperative to make further economies. One-man operation on a larger scale was the logical solution, and, in the study of the problem, the question, "Why not one-man operation, but in the form of two men to two cars?" kept coming up. Obviously, such a scheme would eliminate many of the drawbacks of the ordinary type of one-man car operation, particularly on heavy traffic lines.

The difficulty to be overcome was that of providing a safe passageway for passengers between cars. The articulated center compartment between cars, as had been tried in Boston and Richmond, was discarded, on account of the possibility of opening up when the cars split switches. The idea of mounting the trucks at extreme ends of the cars, to reduce end overhang and allow covered passageways between cars, was found to be impracticable. It was even thought that end doors, interlocked with the control circuit, so as to allow for movement only when the cars were at rest, might be the answer. But in the end the articulated two-car, three-truck combination then being used in Milwaukee and on several steam railroads in Europe was felt to be the best solution.

In September, 1924, the first articulated unit was placed in service. It was constructed from two double-truck, semi-convertible cars, seating 44 passengers each. One platform was removed from each car and the adjoining trucks were taken off, the two bodies then being joined, bulkhead to bulkhead, through a special center truck and cylindrical passageway, which form the point of articulation. The transverse seats were taken out of

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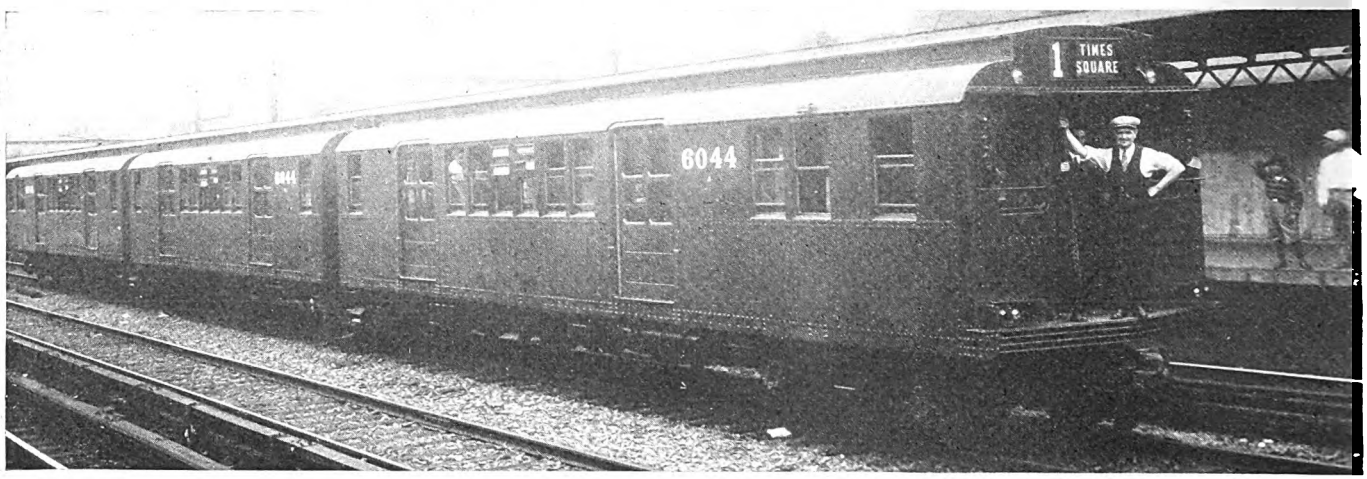
the body which formed the leading half of the articulated unit and longitudinal seats were substituted, while the other body was equipped with the maximum number of transverse seats and a "bay window" seat in the rear. New folding doors and steps were constructed at the forward end of the rear body, and the old doors and steps at the rear platform were removed. A conductor's station was provided in the front end of the rear body, immediately behind the passageway leading from the forward body. The seating capacity of the completed car was 87.

The first train was a success from the beginning, and soon proved to be the most popular piece of equipment on the system. Twenty-one similar units were placed in service in 1925, and twelve more in 1926, making a total of 34 now in service.

The best way to describe the method of operating articulated cars is to describe the operation of line No. 15, Baltimore Street-Gay Street line, before and after the introduction of articulated cars. The old time-table called for 20 cars on the base, and 60 cars on the peaks. Obviously, 40 cars were formerly tied up for peak-hour service only, and these cars were manned by 80 men. Under the articulated car program, these 40 cars were combined into 20 articulated units. The base operation is still carried out by 20 single-car units, but on certain trips in the afternoon, using the evening peak for illustration; the base crews exchange their single cars for articulated cars. This doubles the capacity of the line without adding anything to the labor cost. On the extreme peak, the 20 single cars, previously turned in by the base crews, come out again, manned by 40 men. The saving amounts to 40 men on this line, and the net saving, after allowing for all interest charges, etc., amounts to approximately $2,300 per year per articulated unit, at the present scale of platform wages, and after allowing for spares.

After nearly three years of experience in the operation of articulated cars, the operating officers of the company are agreed that they furnish the most satisfactory means of handling heavy traffic. Articulated cars are suitable for any kind of service where the traffic is heavy enough to warrant reasonable headways. Assuming that five minutes is felt to be the maximum headway, consistent with good rush-hour service, and using Baltimore figures, articulated cars can economically be used to replace any single-car operation of four-minute headway or less. Of course, when five-minute articulated-car service is furnished, in place of four-minute single-car service, the saving is small, but the public has the advantage of a 60 per cent increase in seating capacity. The full advantage of articulated car operation is obtained when they are used on operations requiring 2½-minute headways, or less, with single-car units, assuming that the same seating capacity is furnished in each instance.

Adoption of the articulated type of car by the Washington, Baltimore & Annapolis Electric Railroad was perhaps the most significant application of this type of construction. The articulated design was adopted after a careful study of conditions on this particular property, and the ten units put in operation early this year were constructed to suit its specific requirements. The main-line division from Washington to Baltimore competes with two steam railroads and, therefore, is required to maintain a high-speed, non-stop, comfortable service. At the time of the study the main line had experienced a slight falling off in traffic, but since articulated units have been in service the line has been able to hold its own.



Intercommunication between cars and lower operating expenses are advantages of articulated units used in subway service by the B.-M.T.

Operation of articulated units by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., is extensive and has proved to be extremely satisfactory. At the present time the company has 75 units of three cars each. All of these are in subway service. The three-car units may be coupled together and run in multiples, making trains of nine or twelve cars as desired.

The city of Detroit built its first articulated unit about three years ago. This consisted of a three-car train with four trucks and was designed as a rush-hour unit to handle the enormous crowds from the automobile factories of the city. Its operation required men who had been specially broken in and when extra men were called upon to operate it in the rush hour, this condition was the cause of some difficulty. The length of the cars made its operation on the congested city streets rather cumbersome. It was found also that on the outskirts it was necessary to make practically all of the stops because there was usually some one to get off at each stop. Therefore, on a close headway this unit had to make every stop, whereas with the single-car operation on the same schedule stops were occasionally skipped.

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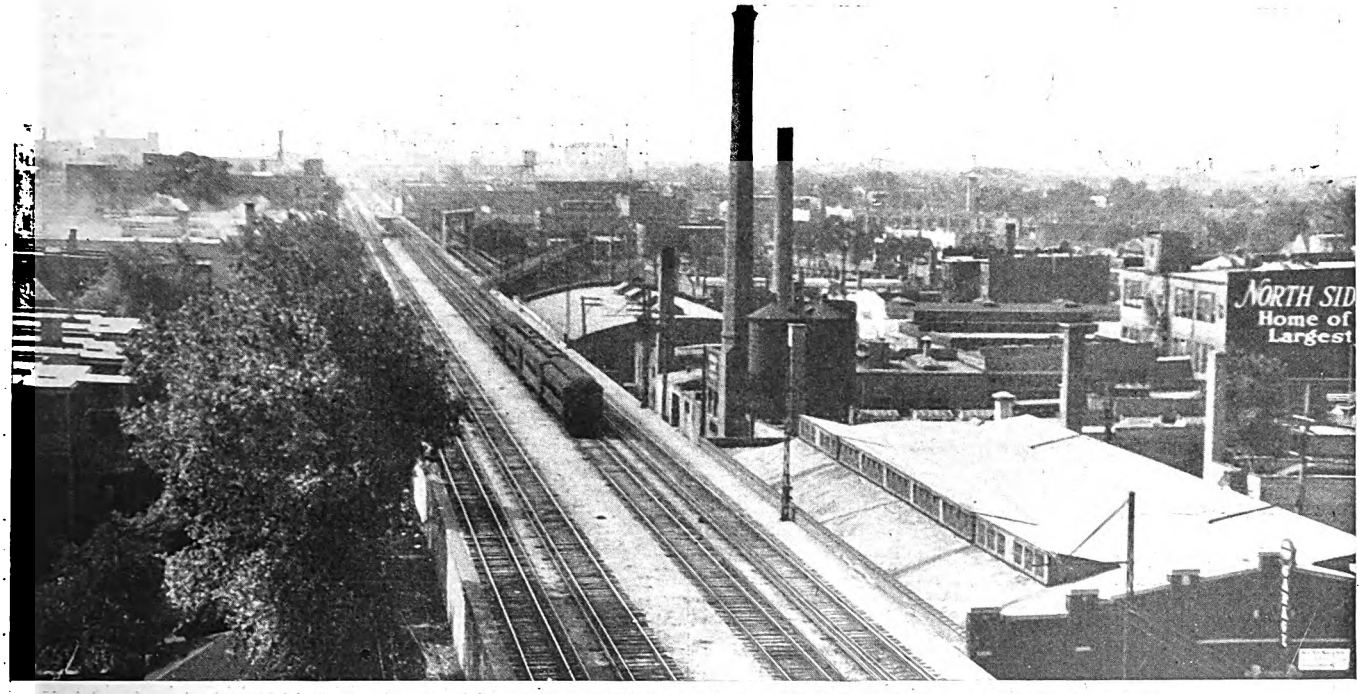

Modern elevated railway structure in Chicago is a marked improvement over older types

Determining the Relation of Rapid Transit *in a Transportation Plan*

By E. J. McIlraith
Staff Engineer
Chicago Surface Lines

ONCE when the spirit of promotion was running strong and enthusiasm prevailed for building railway lines of all types, it was seriously believed that rapid transit could be financed by private corporations and would yield a profit from operation. The original lines of elevated railway or of subway were classed as sound ventures in transportation for which car riders would pay the cost and a profit on the investment as well. It has been proved, however, that the car rider cannot carry all the burden of cost without an excessive fare. Moreover, on economic grounds the car rider should not pay all the carrying charges of the investment in addition to the cost of operation. Such procedure amounts to special taxation of part of the citizens for the benefit of all and to provide special profits for a few.

Today there is general acceptance of the idea that rapid transit is in reality "special right-of-way" transit that provides an additional street. It benefits (1) the city as a whole more than several new streets or boulevards on the surface would do if they were created; (2) the owners of the property the value of which is enhanced because of its increased accessibility; (3) the automobile owner or others using vehicles which have greater freedom of movement on the street because the majority of persons are carried on the new right-of-way; (4) the car rider, who moves faster and can have a wider choice of home district or of locations for employment.

Street congestion due to the general use of private automobiles creates a new demand for separation of the various kinds of traffic to avoid excessive interference and permit the greatest possible use of existing streets for transportation in individual automobiles. If trucks, electric cars, and even pedestrians can move on different streets or on different levels from the private automobile, each class of traffic will be much better served. The most effective separation comes from moving the electric car to a new level. One four-track electric railway on specialized right-of-way (in subway, on elevated structure, or on embankment) can serve more people in the rush hour than seven streets used by surface cars, buses and other vehicles, or ten boulevards for buses and private vehicles, or 25 boulevards used by private vehicles alone. The street area vacated by the cars that formerly carried the people on the surface can serve more of the other vehicular traffic.

The present-day value of such new street levels is

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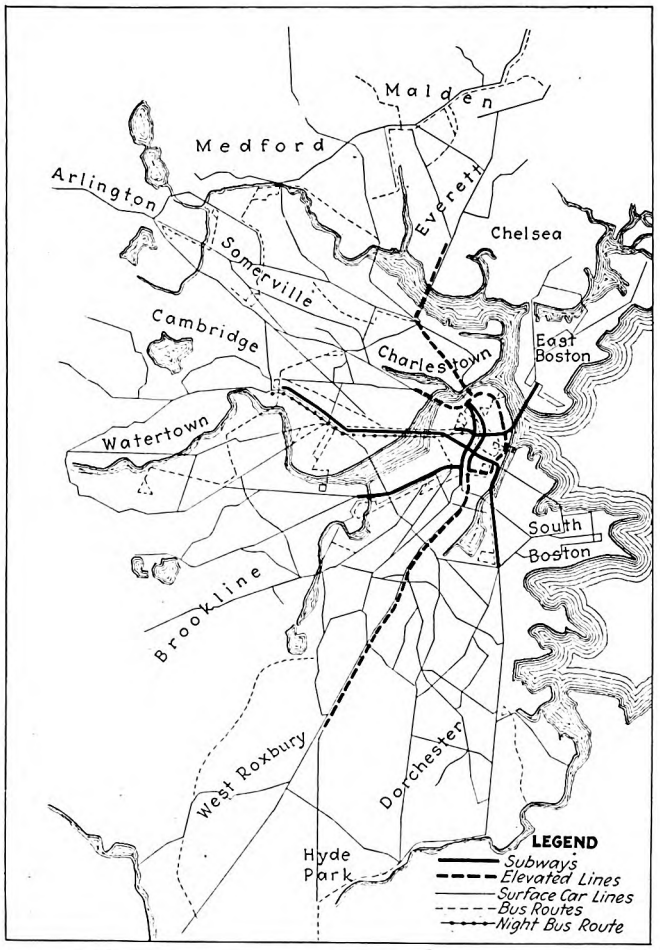
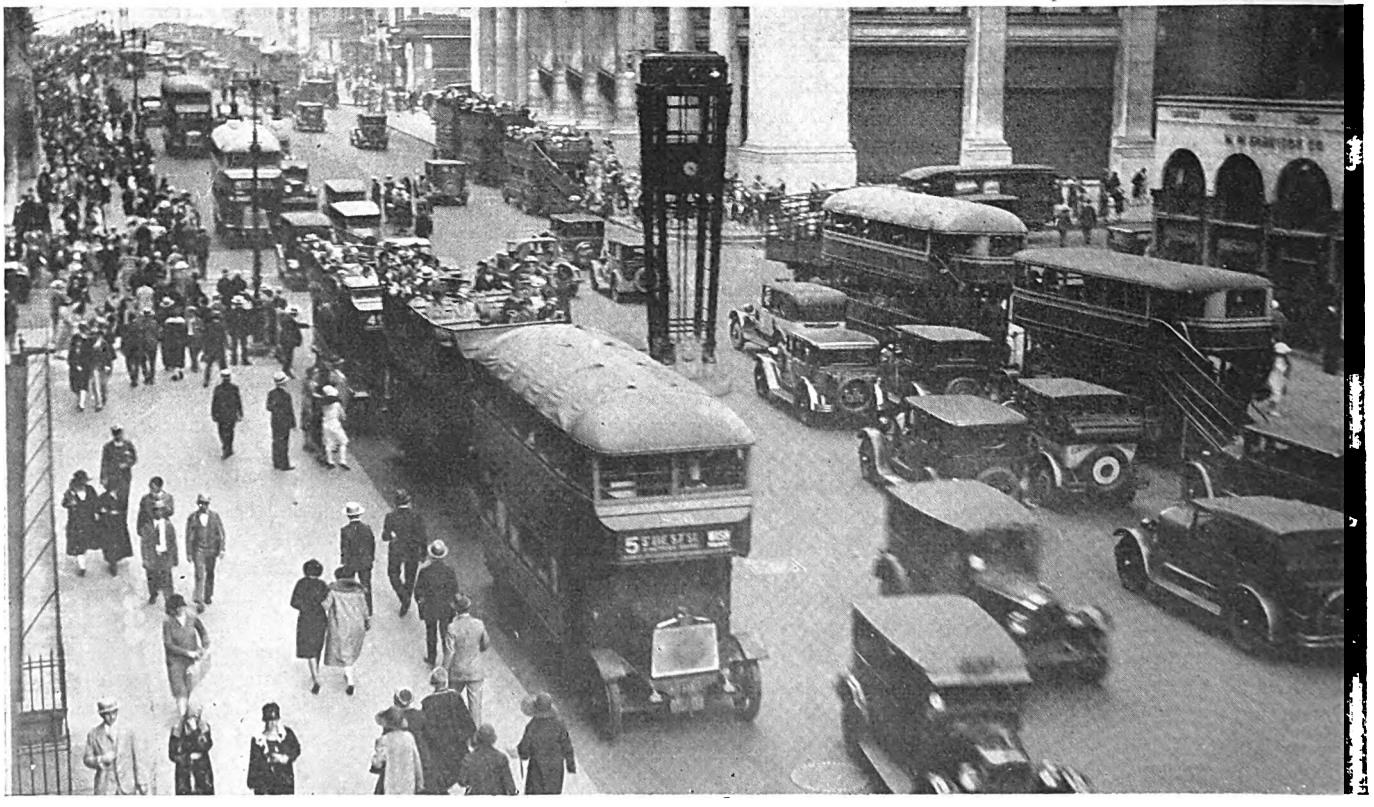


Surface car subways are an important element in Boston's rapid transit system

more vividly apparent than it could have been even a few years ago, when the demand for street space was much less intense. It is now clear that the creation of a rapid transit line is the most effective form of street widening project, and can well be undertaken as a civic betterment rather than as a project financed by the car riders' fares.

There is a great need for increased service from city street area. Roadways are much too narrow for the intense use being made of the building area. Buildings of greater size are being erected, and the concentration of citizens in the central district of each city is mounting almost unbelievably. It is not uncommon in the largest cities to find more than 4,000 persons housed during the business day over a single acre of ground area, and the buildings they occupy are visited each day by at least as many others in the transaction of daily business. For obvious reasons the streets cannot be increased in number or in width in such districts. More use must be made of the existing widths by adding new levels for specialized segregated movement; that is, one level for pedestrians only, one, two or three levels for electric trains, and the surface of the street for the vehicles that must operate in open air. These vehicles must further be controlled or segregated for maximum conveniences by requiring service or delivery vehicles handling goods, supplies or waste materials to operate only at night.

Intensive concentration of the administrative, advisory or managerial functions of commercial development is fundamentally sound. Cities always have housed the leaders of business and dominating forces of the world's activities. Business leaders must have convenient contact and speedy access to each other, and the modern tendency to house such commercial functions in large buildings closely related and with convenient access to one another is not dictated by chance, but by sound logic



In the congested section of Fifth Avenue, New York City, buses on a fifteen-second headway carry approximately 9,000 passengers per hour at a speed of about 5 m.p.h.

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and real economic necessity. It is vital to commercial effectiveness that the administrative leadership be centralized in strategically placed large cities, and that in those cities there be a concentrated central district for that group that must have convenient personal contacts with one another and with clients or customers from out of town.

Such density of use of central business areas will in reality simplify the problems of providing more effective time-saving conveniences and greater comforts. The cost of housing and land per person employed may be higher than in cities of low buildings such as London, but the greater effectiveness of American business methods is forcefully shown in the higher standards of comfort attained by each class of citizens in the cities in this country. Their earning power is greater because of their highly organized performance, and so their share of the world's luxuries is greater.

Rapid transit elevated railway is not considered objectionable in this high-class Chicago residential district

In Boston the buildings are low under city regulation in an effort to promote a widespread business area, yet it only increases the difficulties of getting convenient accessibility. It means longer walks, more time lost, and more people moving farther horizontally on the streets instead of riding farther vertically by fast elevators. It necessitates more miles of streets and increases the mileage of transit track for the same service rendered.

Cities approaching a million in population can well justify some development of special right-of-way transit. In the central section the earlier construction should provide a nucleus for the complete system, yet it need not be extensive at first to serve the purpose of creating new street space and consequent improvement in convenience for movement of pedestrians, vehicles, and electric cars in the busy area.

It is probably better to start with a system of subways for surface cars, thus removing the cars from all streets in a restricted central district and affording good distribution of service by appropriate routings and combinations. As the city grows some or all of these short sections of special separate underground street will be extended outward and may be built also through outlying business centers. As the density of use grows it will become necessary to develop train service over sections of the system, much as is now being done between stations in Boston. There the surface lines serving each section run to a convenient terminal a short distance outside the busy city center, where the passengers walk across a platform to a train that operates into the center of the city, and across to a similar station on another side of the city. Thus the surface cars do the collecting and deliver the passengers at convenient points to the terminus of a short rapid transit line, which uses track space in the center of the city much more economically than would be done by routing all of the surface cars from the exchange terminal to and through the central district. As the city grows the rapid transit train service should be extended as fast as such operation can be justified.

The rush-hour crush on some of the rapid transit lines of New York and the jam of vehicular traffic on Fifth Avenue cause much mistaken moralizing on the futility or impracticability of having concentrated business areas in large cities. Huge buildings are still being built on Manhattan and are projected by sound business organizations. There is ample reason for such investments, and transportation facilities must follow. The troubles of the citizens are not due to the concentration of Manhattan but to faulty planning, faulty principles in financing, faulty theory in creating separate competing systems and faulty statesmanship in neglecting to correct wrong practices in financing and operation when they were recognized and found to be destructive of the city's best interests. Adequate planning could and would have prevented the present troubles and an expenditure that

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is within reason can correct them, but the political and financial difficulties of changing face are so great as to seem nearly insurmountable. Other cities need not experience any such difficulties, and the present mood of the citizens and of officials in most cities indicates that more appropriate planning will be done to keep the transit facilities ahead of the needs of the community.

Take Chicago as an example. There has been general indorsement of the idea of special assessments for partial payment of the cost of rapid transit. The report of the Citizens' Advisory Committee to the sub-committee of the City Council (1926) reads in part as follows:

> The lesson to be learned from New York is that the city of Chicago should not build one foot of rapid transit structure, either elevated or subway, without the application of the principle of special assessment, lest Chicago be precluded from this important method of financing for all time to come.

The present city administration, as well as the previous one, has freely stated the necessity of a sound method of financing based on the theory of distributing the cost according to the benefits received.

Plans have been carefully worked out for the physical layout to give a thorough system to the city, based on a comfortable standard of service at all hours. There need never be in Chicago any of the excessive crowding in rapid transit cars that exists in New York. The development can always be far ahead of the needs of the riders, so that the cars and trains may be only appropriately filled in rush hours, not overcrowded. Jammed loading is quite unnecessary and cannot be tolerated.

Sharing the cost of construction and development of a single system comprising all forms of transportation units will permit competent development as fast as needed without undue burden on any one, and will provide good, co-ordinated service at a moderate rate of fare. However, it is absolutely vital that the correct principle be recognized and applied early in the development of a rapid transit system, so that a few land owners may not make enormous profits from unearned increase in property value at the expense of the car rider, or from all the citizens through their contributions to general taxes, either directly or in rents and increased prices of goods.

A city transportation plan should supplement and assist in logical development of the city by spreading the advantages for the good of all and permitting a normal growth for all sections.

A resolution adopted by the National Association of Building Owners and Managers in June, 1923, includes the following statement:

> Transportation is a servant and not a master. Urban transportation should fit the city. The city should not be fitted to the transportation.

Unfortunately, we have had examples of many miles of expensive rapid transit structures being built through open fields, as in greater New York, at times when the money should have been spent to relieve the highly undesirable crowding in the central business section of the city where the trunk lines are inadequate. The lines built were not planned to fit the city needs, and did not develop in the city's busy section to keep in advance of the needs for service.

Transportation lines should be built neither to exploit real estate nor to control a city plan. The growth and development of transportation should supplement and support the natural tendency of city growth. The expansion of a city street system by the use of subways or other special rights-of-way should be planned toward a comprehensive ideal system, permitting the ultimate economic development of the city, and serving through the various stages of its growth to give all parts of the city reasonable advantage in using, enjoying and profiting from the investments and developments.

Lower end of Manhattan Island, where concentration of business activities in tall buildings exceeds that found anywhere else in the world

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Single-Truck Cars

Best Meet the Needs in Smaller Communities

By Horatio Bigelow
Superintendent of Railway
South Carolina Power Company

More frequent service is given in Charleston, S. C., by Birney cars than would be possible with double-truck cars

SINGLE-TRUCK cars still have an important part to play as public transportation vehicles in cities under 100,000 population. Systems operating them, however, are faced with a real problem in putting them on a sound operating basis. Experience not only in Charleston, but in many other cities of comparable size, indicates that the salvation of these properties depends on holding operating costs to a minimum.

The automobile has made its greatest inroads on railway operating revenues in cities of this size. The parking problem is not so important in these cities as it has become in larger centers, and does not limit the use of the private vehicle for ordinary travel. When the geographical layout of a city between 50,000 and 100,000 population is such that homes and places of business are comparatively close together, those who do not own automobiles always have the option of walking, and do so on comparatively slight encouragement. Under this combination of circumstances the single-truck car, which permits frequency of service to be given at minimum cost, often is the best vehicle to meet the transportation needs of the community.

There is only one serious objection to the use of such cars. That is the poor riding quality on rough track. The length of the rigid wheelbase on a single-truck car necessarily is limited to negotiate the short curves encountered on the average city property. With such cars it is particularly important that track be in first-class condition, or the ride will be so uncomfortable and unattractive as to discourage patronage. It is probably due to this limitation of the single-truck design that many small properties have been led to the adoption of cars much too big and heavy for the density of their traffic, resulting in a serious increase in operating cost as well as long headways. Because of this, costs have been increased to the breaking point on many properties, and

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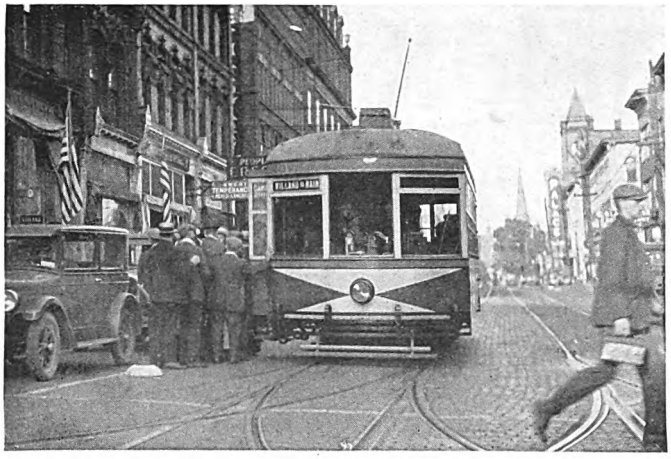


In Jamestown, N. Y., operation of de luxe single-truck cars has increased revenue 7 per cent in eight months

there has been a decrease in number of passengers due to the long waits between cars.

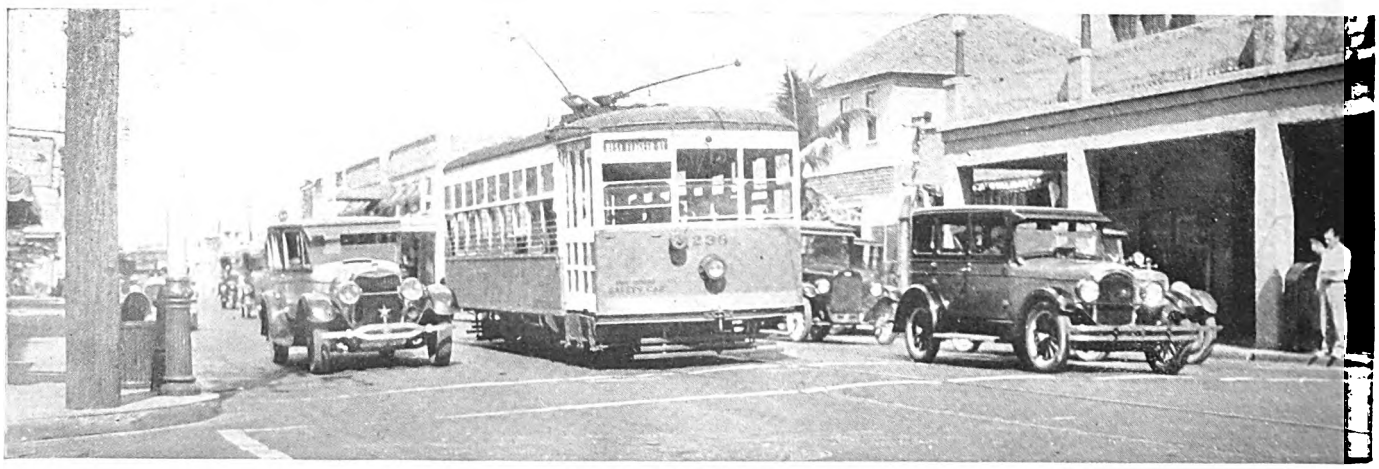
An example of what can be done to solve the problem of reducing operating costs is afforded in the experience of the railway system of the South Carolina Power Company at Charleston. In this city of 70,000 population there is no mass movement or peak load of importance on its urban lines. Distances are short. The city is level. The streets are well paved. Three years ago there were five types of cars in regular service on the system. These were: (1) Birney cars; (2) semi-convertible, wooden, single-truck cars rebuilt for one-man operation; (3) one-man, double-truck (maximum traction) steel cars; (4) wooden two-man, double-truck cars, and (5) steel, center-entrance, two-man cars with multiple-unit control. With this equipment the average energy consumption was 2.18 kw.-hr. per car-mile and the average maintenance cost 2.65 cents per car-mile. For the year 1923 the system showed a ratio of operating cost, including taxes, to gross revenue of 107 per cent, with a consequent loss of many thousand dollars. The edict then went out that the railway department had to be self-supporting if it were to continue operation.

Accordingly, the railway commenced a thorough rehabilitation program. All city operations were placed on a one-man basis. This necessitated the changing over of many of the old cars. During the three ensuing years, although the gross receipts fell off $150,000, there was a decrease in operating expenses of $220,000 and an improvement of 15 per cent in the operating ratio.

The cars converted were seventeen years old on the average, weighed 14 tons each and were equipped with two 40-hp. motors. By 1927 more than half of them had been placed in storage because of the need for extensive repairs. The railway was thus faced with the necessity of adding to its equipment. As the city was just starting a four-year repaving program, with which the company's track rehabilitation had to be co-ordinated, it was deemed inadvisable to purchase new cars at that time. Accordingly, used single-truck, improved Birney-type safety cars, averaging five years old but in good operating condition, were purchased for the same cost as the repairs necessary on the converted cars. These cars weigh 8¼ tons each and are equipped with two 25-hp. motors. It was estimated that they would save ⅔ kw.-hr. per car-mile in energy and ½ cent per car-mile in maintenance over the converted cars. Actually, they are saving $\frac{9}{10}$ kw.-hr. per car-mile in energy consumption instead of ⅔ kw.-hr. per car-mile as estimated, and it is believed maintenance figures when obtained will bear the same relation to the estimated figure. The total annual saving per car from this substitution, considering only energy and equipment costs and neglecting maintenance of track and roadway, should amount to $600. Substantial increase in the proportion of single-truck cars on the property has made it possible to produce operating economies that have prevented further cutting of schedules to meet depleted revenues.

Similar results have been obtained elsewhere. In Knoxville, Tenn., the single-truck car is an important agency in meeting the transportation needs. Features of additional comfort and attractiveness have been incorporated in the design of these cars. On June 1, 1924, the company replaced four old-type, heavy, two-man, single-truck cars with six modern, one-man, single-truck, safety cars on a line which serves the best residential section of Knoxville. This is a route that requires practically the same headway throughout the day. Service was increased 33½ per cent, from a fifteen-minute headway to a ten-minute headway, and revenues increased proportionately.

This substitution resulted in reducing expenses for energy, maintenance of equipment and maintenance of way from 9.1 cents per car-mile to 5.6 cents, a saving of 3.5 cents.



Single-truck cars of the Miami Beach Railway have large platforms with double doors to facilitate passenger movement

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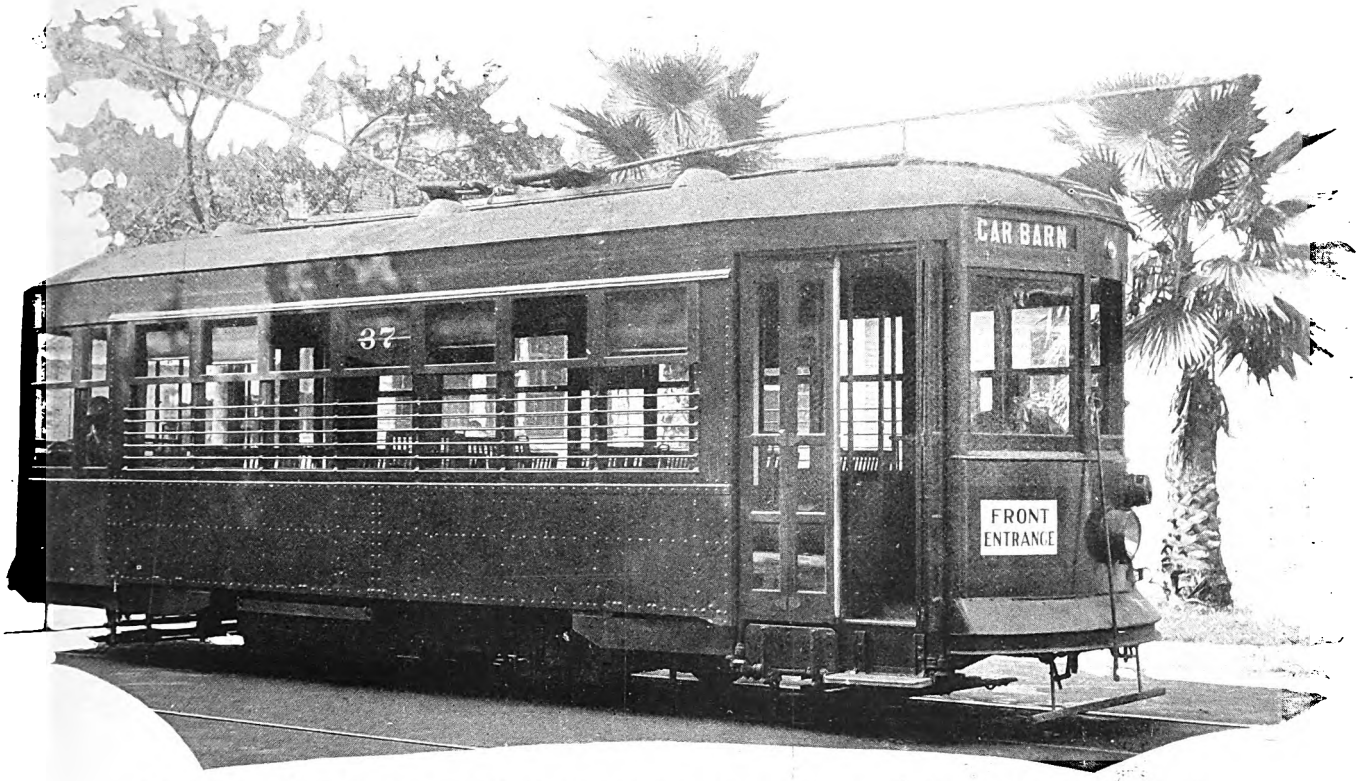
In Zanesville, Ohio, twenty new single-truck, one-man safety cars were put in operation in 1925, in connection with the reorganization of the local railway system, which had emerged from a receivership the year before. Savings made possible by this move helped to reduce operating expenses more than $48,000. Despite a loss in gross revenue of 10.4 per cent, net revenue for the year increased $24,000. Power expense has been decreased $14,000, or from 4.71 kw.-hr. per car-mile at the switchboard to 3 kw.-hr. A comparison of maintenance of equipment costs for 1924 and 1925, the year before the new cars were installed and the year after, shows a saving of $11,572 in this account or 58.6 per cent.

Despite arguments in favor of double-truck rather than single-truck cars, it was thought better to provide shorter headways with single-truck cars rather than longer headways and larger cars. Like the Knoxville cars, those units can be operated either front entrance and exit or front entrance, rear exit. The rear door is controlled by a separate valve from the motorman's position. Two rear vision mirrors are used, one inside and one outside the vestibule. An auxiliary red lamp on the rear dash is arranged to light when any of the doors are open and warn approaching motorists that the car is taking on or discharging passengers. Seats and backs are of spring construction and are covered with taupe plush of a design harmonizing with the interior finish. The single step between the street and the platform is recessed, the folding doors protecting the step when in the closed position.

The Mobile Light & Railroad Company, Mobile, Ala., ordered some single-truck, Birney, one-man cars during the war period. On a subsequent order for cars to be delivered this year, a more strongly built unit weighing 10 tons was specified. In this design there is a wider aisle so that passengers can pass backward and forward from their seats in the rear of the car without brushing against seated passengers. Platforms are larger with both exit and entrance doors, and there is a rear exit, controlled by the motorman, for the use of colored passengers. A drop platform makes access to the car easy. This platform is 5 in. below the car body, the first step from the street is 12 in. above the rail, and the second step is 11 in. below the platform.

In Mobile these single-truck, safety cars are operated on the streets where the automobile traffic is the heaviest, while the majority of the two-man cars are operated for the greater part of their routes on tracks within parkways or on private right-of-way. Despite this the number of accidents per car-mile is 13 per cent greater on two-man cars than on one-man cars. On the one-man car lines more frequent service is given than formerly when two-man cars were used, while track maintenance is less than on the two-man routes. Moreover, schedules are more easily maintained on the one-man routes on account of the quicker acceleration and stopping.



Better speed is maintained in Mobile, Ala., with single-truck, one-man cars of this type than with two-man cars on account of quicker acceleration and stopping

Certain unusual features have been incorporated in the design of the latest single-truck, one-man, safety cars of the Miami Beach Railway. The warm, humid climate of Florida has a harmful effect on the materials used in car construction. In order to prevent rapid oxidation of the metal, these cars utilize copper-bearing steel plates extensively. All wood has been treated with preservatives in order to guard against destruction by insects and to give long life. All cars are double-end with wide double-stream doorways. In contrast to the new cars at Knoxville and Zanesville, the cross seats are of wood slat construction.

De luxe single-truck cars were recently purchased by the Jamestown Street Railway, Jamestown, N. Y., for

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city operation. These cars are designed with convex sides, round ends, and arch roofs. The exterior painting scheme has a pyramid gray body color, blue belt rail, desert sand letterboard, and cream sash, all blocked off by a horizontal black stripe. The car roof is gray and the trucks black. Interiors are finished in mahogany with white veneer headlining and gray trim. Broad seats with deep spring cushions and padded backs are covered with genuine Spanish leather. Thirty passengers can be seated comfortably. Ample knee room is provided by the spacing of the seats at 31-in. centers. Floors are covered with inlaid rubber tiling colored to blend with the interior finish. This tiling serves to deaden truck noises. Peerless ventilators installed on the roof are fitted with grille and register. Cars are heated with individual double-coil, truss plank heaters, and the temperature is regulated by thermostatic control. The one cab heater is supplied with a separate control. An unusual number of safety devices have been incorporated in the design, including even an emergency exit door on the left side at the extreme rear. Large, folding, selectively-controlled, air-operated doors permit easy entrance and exit. When the door is open a stop sign attached to the exit door acts as a warning to approaching vehicles that passengers are alighting. The cars are provided with brilliant interior illumination: three two-lamp dome fixtures on the ceiling and two door lights, besides the usual farebox, sign, tail and head lights. A stop light on the rear shows red when air brakes are applied. Resistance grids with suitable covering, permitting proper ventilation and preventing entrance of rain and snow, are installed on the roof instead of beneath the car floor. All platform control apparatus is inclosed in mahogany cabinets, creating a ship-shape platform appearance. Large section, plate-glass windows in the vestibule insure an unobstructed view at all times. Seven large windows on the right side of the car and nine on the left side, with cross-bar window guards, provide clear vision without danger of injury from passing cars.

There is no doubt that passengers should be made as comfortable as possible on street cars so that they will "come again." On suburban and interurban lines and on the longer city routes, where double-truck cars are operated, spring seats and backs neatly upholstered attract patronage and increase revenue. Floor covering to deaden truck and equipment noises and adding to the finish of the car also pays. With single-truck, safety cars operated on the short routes it is a question whether or not it will pay to equip them with upholstered seats and floor covering? It costs approximately $600 per car to do this. On three of the railways mentioned above, i.e., Knoxville, Zanesville and Jamestown, the single-truck safety cars are provided with such seats and on two of the properties, Zanesville and Jamestown, with floor covering. Decreased industrial activities in Zanesville have made it difficult to determine the gain in revenue produced by the installation. In Jamestown, N. Y., the de luxe, single-truck cars with the equipment in question have increased revenues 7 per cent in eight months. Despite such showings not all railway managers feel that the expenditures for these features are justified.

The primary question in determining the field of the single-truck car is whether there is any pronounced mass movement during the day? If there is, the single-truck car is like "Dobbin" in the early days, it can't pull the load. The single-truck, one-man, safety car still holds its own on the smaller systems where there is no mass movement and on the light traffic lines of the larger systems. Given good track, the light-weight, one-man, single-truck, safety car furnishes the most economical type of transportation known.

Rear exit is provided on single-truck cars operated in Knoxville, Tenn.

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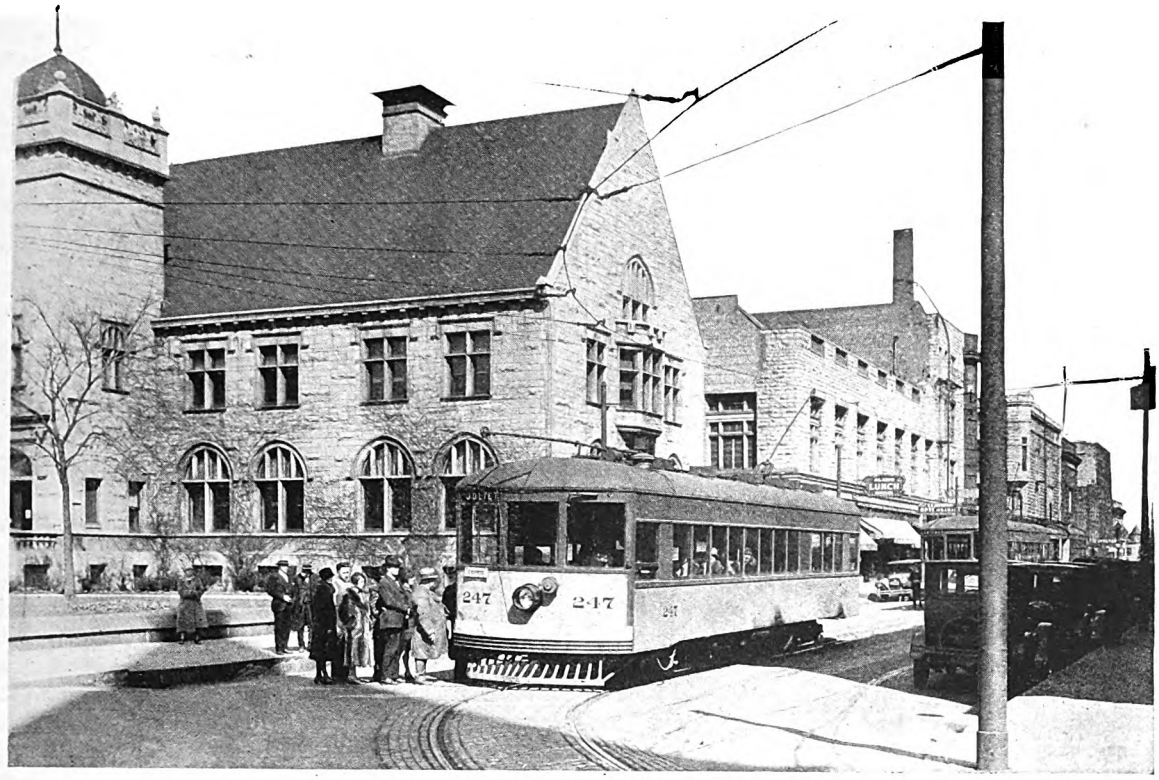

Light interurban cars have played an important rôle in the rehabilitation of the Chicago & Joliet Electric Railway

Radical Changes Save the

Light Interurban

By J. R. BLACKHALL

Vice-President Chicago & Joliet Electric Railway
Joliet, Ill.

SOME ONE has defined competition as "the keynote of success," and certainly it is true that competition has been responsible for many radical changes in American industry. In the early days there was the destructive competition of rates and prices. Gradually, however, this has passed so that present-day competition more generally concerns service and quality, rather than rates and prices. In the transportation field competition has been responsible for many changes in operating practices.

On the whole competition has been felt more keenly on interurban lines than on city lines. This has made it imperative to develop some remedy. Following experience with lighter weight cars in city operation, and the encouraging results obtained with their use, it appeared logical to adopt lighter interurban equipment with some changes of design. This would require less capital investment, make it possible to reduce labor costs, allow faster schedules with the ever-increasing number of stops, and attract additional passengers. About the time of the introduction of the Birney car, several companies began experimental operation of light-weight, double-truck cars that not only rode easier and were more attractive to the public than the cars then in common use, but also promised large reductions in operating costs. When the trial operation of the new type equipment demonstrated greater operating efficiency and increased traffic by virtue of better and more regular operating schedules, many other companies were led to the adoption of such equipment.

Among the roads that first demonstrated the feasibility of the light-weight car for interurban service was the Kentucky Traction & Terminal Company. This company was in a situation about as difficult as it could be, with traffic decreasing rapidly as a result of jitney and other competition and high operating and maintenance costs. The story of the rehabilitation of that property to a dividend-paying condition is history now and need not be repeated here. Introduction of the light-weight car by this company was its salvation.

The Chicago & Joliet Electric Railway, operating an interurban line between Joliet and Chicago, although never having had really heavy cars, nevertheless found itself in a difficult position when operating costs in-

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Energy Savings with New Light-Weight Interurban Cars

Month	Kilowatt-Hours per Car-Mile: New Cars 1926–7	Old Cars 1925–6	Difference	Per Cent	Total Miles 1926–7	Total Estimated Kilowatt-Hour Saving
Sept. 8-30..	2.38	2.68	0.30	11.2	39,448	11,820
October....	2.29	2.98	0.69	23.2	45,355	31,220
November.	2.26	2.90	0.64	22.1	42,991	27,500
December..	2.24	2.97	0.73	24.5	44,190	32,200
January...	2.42	2.62	0.20	7.6	42,943	8,600
February..	2.14	2.81	0.67	23.8	36,770	24,600
March.....	2.15	2.74	0.59	21.6	40,960	24,100
April.....	2.16	2.80	0.64	22.8	43,871	28,100
May.....	2.05	2.66	0.61	22.9	50,638	30,800
June.....	2.10	2.70	0.60	22.2	48,762	29,200
July.....	1.96	2.53	0.57	22.6	56,489	32,200
	2.196	2.762	0.566	20.5	492,417	280,340

Total saving in energy cost of 280,340 kilowatt-hours at $0 0186 = $5,214 36

Comparative Earnings, Platform Expense, and Energy Costs

	1926–7	1925–6	Saving or Difference	Per Cent
Gross earnings	$331,677.55	$312,711.44	$16,966.11	6.06
Average kilowatt-hours per car-mile	2.196	2.762	0.566	20.50
Platform expenses per car-mile, cents	4.40	6.86	2.46	35.90

Summary of Increased Earnings and Savings

Total miles operated by new cars	492,417
Total kilowatt-hours saving on new cars	280,340
Total increase of gross earnings	$18,966.11
Total savings platform expense	12,113.45
Total savings power costs	5,214.36
Total earnings and savings	$36,293.92

creased. After a careful study of the results obtained by other companies that had adopted light-weight cars and the results of its own operation of light-weight cars in city service, the company concluded to replace its equipment on the interurban line with modern, light-weight cars. Ten cars were purchased, constructed to design and specifications furnished by this company, including several new features. They were delivered and placed in service in September, 1926. Six of them are of the single-end, one-man type for through interurban service, the four other cars are of the double-end, one-man type for local interurban service.

The new cars weigh 39,000 lb. each, compared with an approximate weight of 62,000 lb. for the old type cars. They are equipped with four 35-hp. motors as compared with four 100-hp. motors on the heavier cars. With the old heavy type equipment adherence to the schedules was fast becoming an impossibility. To determine the motor capacity for the new cars, a thorough analysis of service requirements was made by the company's engineering department in collaboration with the manufacturer. The lighter weight cars have been able to maintain schedules in the face of a continual increase in number of stops per mile.

As the outward appearance of the car makes the first appeal to prospective passengers, considerable thought was given to securing a pleasing, streamline effect and painting the cars in an attractive color combination. The general interior appearance has been improved by concealing all air piping, switches, meters, etc., in mahogany finished cabinets. All side windows are fitted with window guards of the disappearing type that rise with the sash, affording better visibility for passengers and adding to the attractiveness of the car. Interior lighting is of the semi-indirect type, a soft illumination being furnished from overhead dome fixtures that eliminate all glare. Car seats are of semi-individual type, comfortably upholstered in leather and plush. The characteristics noted above are relatively new for cars of this type and have a distinct appeal to the public. The ramp of the floor from the vestibule entrance permits a low step height and eliminates the necessity of any additional step from the vestibule to the car. Contrary to usual practice, sliding doors were provided, adding to the general clean-cut appearance of the car. This has reduced noise and maintenance. Floors are covered with battleship linoleum.

Prior to the purchase of the cars, it was estimated that by their adoption an annual reduction in operating expenses of approximately $30,000 would be made and also an increase of $10,000 effected in revenue, or a total increase in net revenue of $40,000 with a capital investment in the new equipment of $168,000. While an increase in wages of operators that went into force on Jan. 1, 1927, materially effected the estimated saving, the reduction in operating expenses, not including any reduction that can be attributed to maintenance of track and roadway and equipment, amounts to $17,327. Gross earnings for eleven months show an increase of $18,966. On this basis, the increased net will about equal the estimate for the year. No definite figures can be given of savings in maintenance of track and roadway and equipment, but it is reasonable to assume that there will be a saving in

Comparative Gross Earnings of Interurban and City Lines Before and After Ten New Interurban Cars Were Put in Operation

Month	Interurban Lines: 1926-7	1925-6	Difference	Per Cent	City Lines: 1926-7	1925-6	Difference	Per Cent
September 8-30.....	$22,348.78	$21,090.21	+ 1,258.57	+ 5.95	$23,754.75	$23,128.21	+ 626.54	+2.70
October	30,347.00	27,786.08	+ 2,560.92	+ .22	23,516.11	23,813.66	— 297.55	—0.88
November.....	27,696.05	25,766.82	+ 1,929.23	+ 7.4	35,589.41	34,585.02	+1,004.39	+2.9
December.....	27,977.77	26,381.04	+ 1,596.73	+ 6.0	40,780.75	40,591.71	+ 189.04	+0.4
January.....	26,194.27	25,743.27	+ 451.00	+ 1.65	38,407.02	38,615.81	— 208.79	—0.54
February.....	24,113.58	23,131.52	+ 982.06	+ 4.25	32,510.66	33,497.02	— 986.36	—2.95
March.....	25,965.60	23,822.64	+ 2,142.96	+ 8.85	33,983.45	36,195.43	—2,211.98	—6.10
April.....	28,202.04	26,079.40	+ 2,122.64	+ 8.15	32,291.40	34,621.20	—2,329.80	—6.72
May.....	37,010.90	36,286.92	+ 725.98	+ 2.00	31,527.45	32,776.83	—1,249.38	—3.81
June.....	34,205.62	33,808.85	+ 396.77	+ 1.17	30,612.66	30,455.96	+ 156.70	+0.51
July.....	47,615.94	42,814.69	+ 4,801.25	+11.2	30,779.17	29,944.12	+ 835.05	+2.79
Total.....	$331,677.55	$312,711.44	+18,966.11	+ 6.05	$363,752.83	$368,224.97	—4,472.14	—1.22

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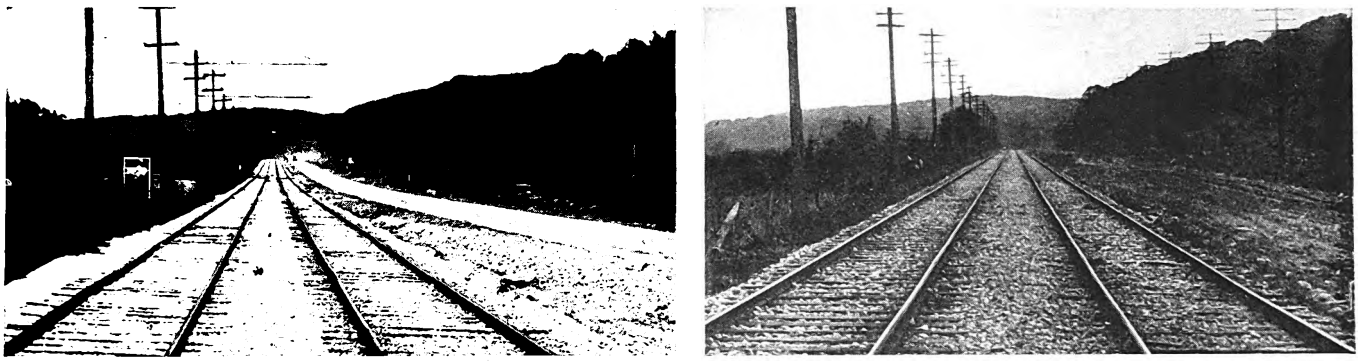
each of at least 1 cent per mile. On that basis there would be an additional saving of more than $10,000 by the adoption of the lighter weight equipment, or a total increase in net of $50,000. That is a return of 30 per cent on the money invested in this new equipment.

The increase in gross earnings amounts to an average of 6.06 per cent, whereas the earnings had previously remained practically stationary and in decided contrast to a decrease of $44,072, or an average of 1.22 per cent during the same period on the Joliet city lines operated by the same company. The increase in revenue can be attributed to prompt appreciation by the car riding public of greater riding comfort of the new cars and the better maintenance of schedules with a slightly higher average speed, this being the result of more rapid acceleration and braking of the lighter type equipment.

An average energy saving of 20.5 per cent has resulted from the weight reduction of the new cars. The old type car consumed an average of 2.76 kw.-hr. per car-mile against a consumption of 2.20 kw.-hr. per car-mile for the new equipment. One-man operation has effected a saving in platform expense of 2.46 cents per car-mile existing operating conditions. During the period between which the photographs were taken the original angle bar joints have been replaced with Weber joints, ties have been renewed as required and additional ballast added where necessary.

One-man operation is an important feature of the light-weight car from more than one angle. In addition to the large reduction in platform expense, such operation affords greater safety to the public, for with one-man operation there are actually fewer passenger accidents because responsibility and control of the car are centered in a single individual instead of being divided, as is the case on the two-man cars. As an additional factor of greater safety in transportation, many companies are now adopting safety car appliances on interurban equipment similar to those on city type cars.

The experience of some eight to ten years operation of light-weight, double-truck electric cars throughout various parts of the country under many different conditions clearly indicates that this type of car will stand up as well as if not even better than the old, heavier type of cars. At the same time the great riding comfort and



At left—Track of the Chicago & Joliet Electric Railway as it appears today, after being thoroughly reconditioned. Note the adjacent concrete highway. At right—The same track as it appeared twenty years ago, when the highway was unpaved

during the eleven-month period, or an equivalent of 35.9 per cent. While as yet there are no definite figures available on savings in maintenance of equipment and roadway, from the experience of other railway properties light-weight equipment should result in a reduction in track maintenance costs of approximately 30 per cent and a like amount in equipment maintenance. The experience of other companies that have adopted light-weight, double-truck cars during the past eight or ten years has been generally similar to that of the Chicago & Joliet Electric Railway.

It must be admitted that the riding qualities of light-weight cars on poorly maintained tracks are apt to be poorer than those obtained with heavier cars, making it imperative that tracks and roadway be maintained in better condition than has been the practice of many companies heretofore. However, once the track is placed in good condition, maintenance is considerably less than for a track over which cars weighing from 60,000 to 105,000 lb. are operated. Illustrative of adequate track maintenance, two views of a section along the interurban line of the Chicago & Joliet Electric Railway are presented. One photograph was taken more than 25 years ago when the road was first constructed, and the other in August of the present year. The original 70-lb. T-rail is still in service, and judging from its present condition it has an additional life of at least twenty years under higher speed average afforded have resulted in increased passenger traffic, while the savings in maintenance and power costs have more than justified the expenditure of capital invested in such equipment. The results obtained by companies that have adopted the modern type, light-weight car challenge the attention of even the casual observer and warrant the most serious consideration for still greater improvement in the field of car design.

At the present time this company is building an all-aluminum car body for city service that will be mounted on trucks that are a distinct departure from the standard trucks now in common use. The car complete, with electrical equipment and motors, will weigh approximately 22,000 lb. with a seating capacity of 50. It is entirely feasible that a car embodying the same principles, with some modifications of design and capacities, can be developed for higher speed interurban service, effecting even greater economies than are being obtained by the operation of the interurban car that has been described herein.

Above all, the future success of the interurban railways depends entirely in having the good will of the public they serve in order to secure its patronage and co-operation. To obtain and hold that good will it is necessary to deal honestly with it and render the very best possible service. The modern light-weight interurban car offers one medium of securing that good will.

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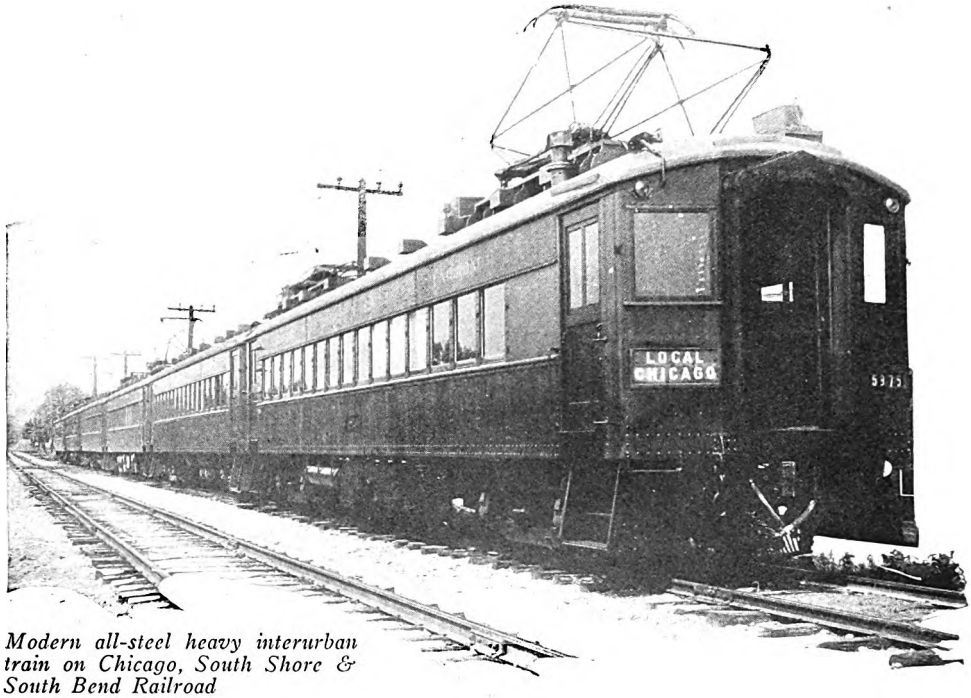

Modern all-steel heavy interurban train on Chicago, South Shore & South Bend Railroad

Heavy Interurban

Meets the Urge of Automobile Competition

By C. H. Jones
General Manager
Chicago, South Shore & South Bend Railroad

RADICAL changes have come over the transportation business during the past decade and what was once considered almost a monopoly is now a highly competitive industry. This has been brought about by the vast strides made in the manufacture of automobiles and the building of many fine highways, which have made it possible for every automobile owner to compete with organized transportation companies. The effect of this competition, however, has not been entirely detrimental to the railways as it has created in the minds of people the desire to travel and has thereby made potential patrons for them, thus broadening the field from which business can be drawn.

The natural field for heavy interurban operation lies adjacent to the centers of population, where the potential possibilities are large. Such territory is generally well supplied with good highways, making the competition keen. The novelty of driving an automobile is wearing off for many people, however, while the desire for traveling is still with them. With service that satisfies them and plenty of hard sales effort and advertising it is possible to wean them away from the highway to the rails, especially with the aid of congestion, which is becoming worse daily.

In a number of instances, railways which operated under such conditions have been lifted out of the hole and converted from run-down interurbans to high-class electrified railroads, getting their share of the traffic in their territory and creating business that had never existed before. It is along these lines that the greatest possibilities lie for making the electric interurbans again a predominating factor in the transportation field.

A recent example of this is the South Shore Line, running from Chicago, Ill., to South Bend, Ind., a distance of 90 miles. This line was built in 1908 and 1909. For a few years it seemed to have a rosy future. But due to competition and the fact that it did not keep up with the transportation requirements of the territory, it gradually declined in popularity. It was just about ready for the scrap heap when it was modernized, and within the short period of a year has become a popular transportation agency, clearly demonstrating that the public appreciates good service and will give its patronage when such service is furnished.

To meet the demand for better transportation many physical changes on the line were required. One of the most important of these provides a first-class entrance into Chicago, delivering people into the heart of the city. This was done by arranging for operation over the tracks of the Illinois Central Railroad. This one thing probably had more to do with building up the business than any other single step which was taken.

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Car equipment comes under the closest scrutiny of the traveling public. In the case of the South Shore Line this question presented a problem of considerable magnitude and received most careful consideration, since the old equipment was worn out and had to be replaced. Our standards have been raised and are now based on the luxurious finish and comfort of the modern sedan automobile. Increase in business has required the purchase of a second group of cars, and on these an effort was made to add improvements over the first lot. While these improvements have been minor in character they have brought forth much favorable comment from patrons, showing that they are recognized and appreciated.

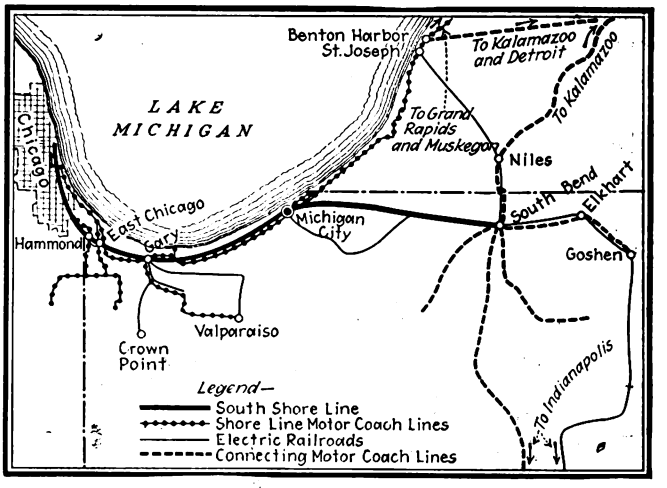
The pleasure of a journey depends to a large extent on the smoothness of operation, and this can only be had over a roadbed which is well maintained. To this end a great deal of work has been done on track that was originally laid with 70-lb. rail. New joints have been installed on the old rail until such time as it is financially possible entirely to replace all rail with 100-lb. section, for which a very definite program has been laid out and is being followed.

Station facilities deserve careful consideration, as in many cases they are the patron's first point of contact with the railroad and create either favorable or unfavorable impressions, depending on whether his necessities are provided for in the way of waiting quarters. We have found that well equipped and operated concessions serving light lunches, beverages, cigars, cigarettes, candy, etc., go a long way toward making interurban stations attractive and satisfying the passengers' wants.

With all these facilities must go good service, because that is what a railroad has to sell, and all of the things mentioned before are only the tools used in providing the service. Frequent and fast service, together with maximum reliability, is what influences most the traveler's choice. In many instances it is necessary to put on increased service considerably in advance of the business justifying it, because with the schedule in effect the road has something on which can be based effective advertising and sales work. The speed of operation should be just as high as possible with safety and absolute certainty that the schedule can be maintained nearly all the time.

A considerable part of the South Shore Line is single track. Hourly service is operated over the entire line daily with half-hourly service over 25 miles of single track on Saturday, Sunday and holidays. This requires well laid out passing tracks at meeting points. A journey that is continuous is a great deal more pleasant than one on which it is necessary to back in or out of sidings. This has been overcome on the South Shore Line by making the sidings long and double ending them, using special trackwork that will allow operation through them at high speed. This arrangement has worked out well and many of our patrons believe that we have considerably more double track than we actually have, as there is practically no stopping at meeting points. Operation has been materially aided by making the maximum use of signaling.

Heavy electric railway service resembles closely that of the trunk line railroads, and the traveler who uses it expects practically the same conveniences that the latter offers. We believe that the operation of dining and parlor cars is a necessity, if the commercial traveler is to be catered to, as he is accustomed to it and uses it to



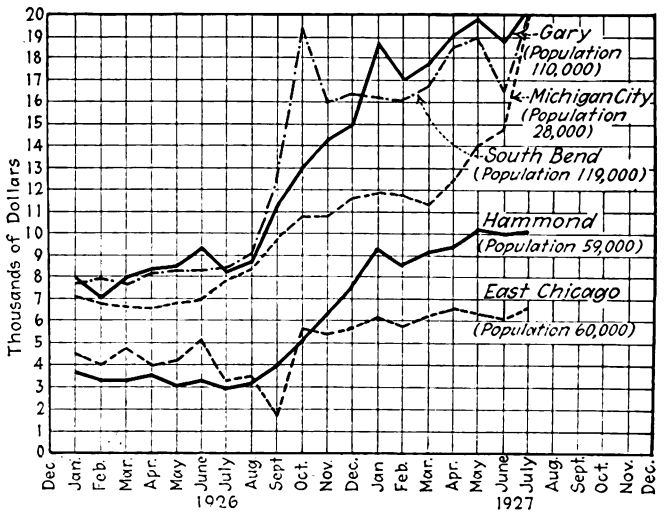
Chicago, South Shore & South Bend railroad and bus routes

conserve his time. This type of service, to be attractive and really get the best results, requires that everything in the way of service, food and prices must be exceptionally good.

With all of the above facilities provided the problem is then one of selling the service to those who want to travel for business or pleasure, and to create business where it did not exist by selling the territory served to those living outside of it.

The selling of transportation service is a comparatively new art and on its success largely depends the properity of the railroad. Enlisted in this sales organization must be every employee of the railroad. Each has a definite part to play. Those in the train and station service, who come in direct contact with the public, have it in their power to make the patron's journey a pleasant one and induce him to use the service again and to advertise it to his friends, thus making him a booster for you; or they can create an unfavorable impression and make him a knocker.

The South Shore Line and its affiliated companies in the metropolitan district of Chicago have felt for some time that their best chance for success and maximum service to the public lies in the way of creating business by popularizing the territory served, and to that end a new department of the railroad was created, which is known as the Outing and Recreation Bureau. This



Revenue has increased greatly since new equipment was put in service

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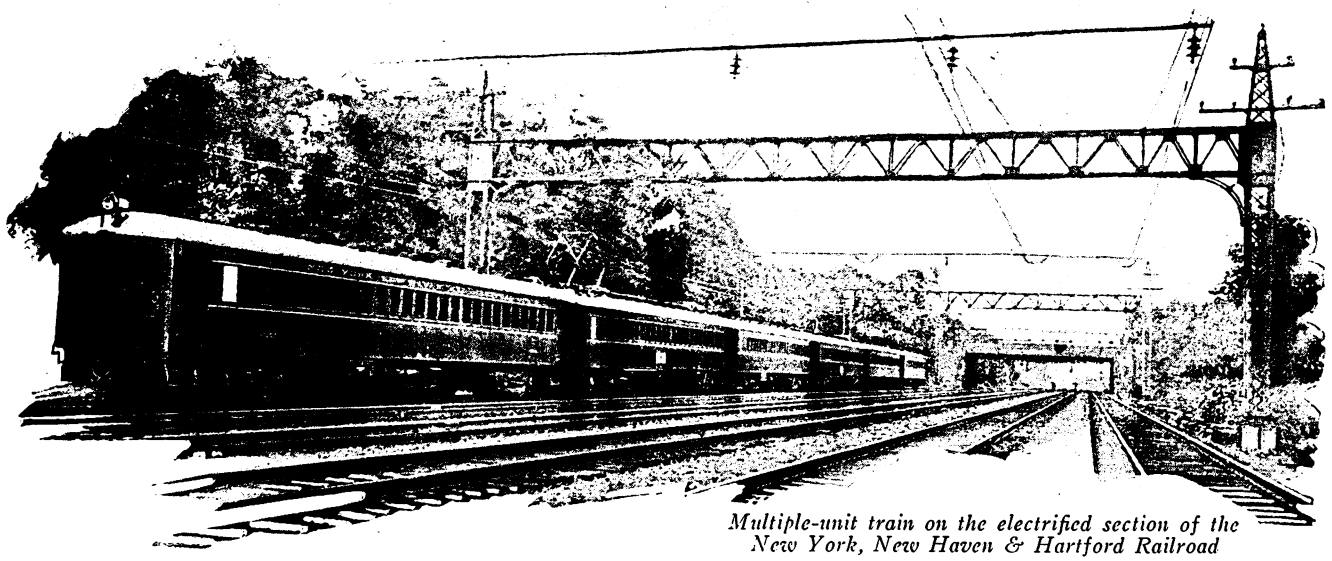
Electrification of Railroads

Makes for High-Grade Suburban Service

By H. F. BROWN
Chairman Committee on Heavy Electric Traction, American Electric Railway Association
Assistant Electrical Engineer New York, New Haven & Hartford Railroad



Multiple-unit train on the electrified section of the New York, New Haven & Hartford Railroad

STEAM railroads serving the larger metropolitan districts of this country have from their earliest beginnings been among the leaders in foreseeing and solving the problems of community transportation. Even before the rapid transit lines in Chicago, Boston and New York were electrified during the period from 1900 to 1905 some of the steam railroads had turned their attention to the use of electricity for a motive power.

Certain difficulties are inherent to all suburban service on steam railroads. This class of service is tremendously exacting. Schedules must be maintained even more rigidly than for long-haul business. The casual traveler, or one traveling from a long distance, is not so prone to be critical of delays as are those who commute daily, even though the delay is slight. Further, when train movements are at their peak during the rush hour in a congested terminal, with but short headway, a delay of even a few minutes is of far more serious consequence to all other terminal movements than in the case of a delay to the through train. Electrification, by increasing reliability, has greatly reduced delays of this nature.

Notable among the earliest installations were the electrification in June, 1895, of the Nantasket branch of the New York, New Haven & Hartford Railroad for passenger service and the Baltimore tunnel of the Baltimore & Ohio Railroad for freight and passenger service, in the same year. While neither of these installations was for suburban service in the strict sense of that term, their success proved the adaptability of electric operation for heavy traction and paved the way for further installations.

By 1898 electric passenger service had been installed between Hartford and Bristol, Conn., and between Stamford and New Canaan, Conn., on the New Haven system, and also, in 1900, on the same system connecting Providence, Bristol, R. I., and Fall River, Mass. All of these installations were at 600 volts d.c. and were suburban as well as interurban in character. The Hartford-Bristol electric service was later abandoned for various reasons, but the electric service connecting Fall River, Bristol and Providence is still in successful operation, and the Stamford-New Canaan branch has been since re-equipped for 11,000-volt a.c. electric operation.

Summary of Suburban Electrifications

Railroad and City	System Electric Traction	Date	Type of Equipment
Long Island, New York	650 volts d.c.	1904	Multi-unit cars
New York Central, New York	650 volts d.c.	1906	Multi-unit cars and elec. locomotives
New York, New Haven & Hartford, New York	11,000 volts a.c.*	1907	Multi-unit cars and elec. locomotives
Southern Pacific, Oakland	1,200 volts d.c.	1911	Multi-unit cars
New York, Westchester & Boston, New York	11,000 volts a.c.	1912	Multi-unit cars
Pennsylvania, Philadelphia	11,000 volts a.c.	1915	Multi-unit cars
Baltimore & Ohio (Staten Island) New York	650 volts d.c	1925	Multi-unit cars
Illinois Central, Chicago	1,500 volts d.c.	1926	Multi-unit cars

*Operates also over 12 miles route 650 volts d.c. joint with New York Central

Development of the multiple-unit control system at about this time gave a great impetus to the application of electric traction to train service. In operating several cars, each equipped with motors, from one point of control, it was obvious that higher acceleration rates and

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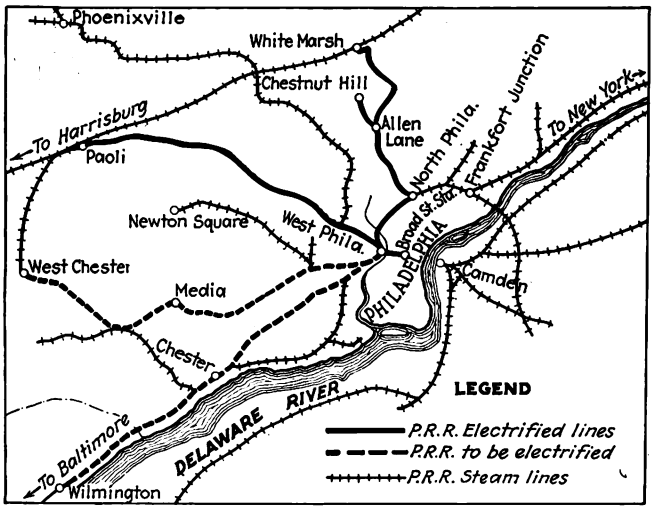


Philadelphia electrified zone of Pennsylvania Railroad

consequently higher speeds between stations short distances apart could be obtained than with locomotive-hauled trains. Terminal switching also could be greatly simplified. Electrification of the elevated and subway lines in the larger cities quickly followed this development, coincident with the installation of electric motive power on three of the steam railroads entering New York, carrying a very heavy suburban traffic. The Long Island Railroad, in 1904, was the pioneer steam road to electrify its suburban service, followed in 1906 by the New York Central and the New Haven in 1907.

Since these earlier installations other railroads have adopted electrification for the solution of their own suburban service problems, until at the present time the list includes no less than eight railroads operating this type of service electrically.

Two outstanding facts are apparent in the tabulation on the preceding page, as follows:

1. Multiple-unit cars are the most popular type of equipment for this class of service.

2. Every system of electric traction, with one exception, now in use in the United States is being successfully used for suburban service at the present time, the one exception being the 3,000-volt direct-current system. This does not mean that this system is not suitable for this service, but it is a fact that multiple-unit equipment of this type has not yet been produced commercially.

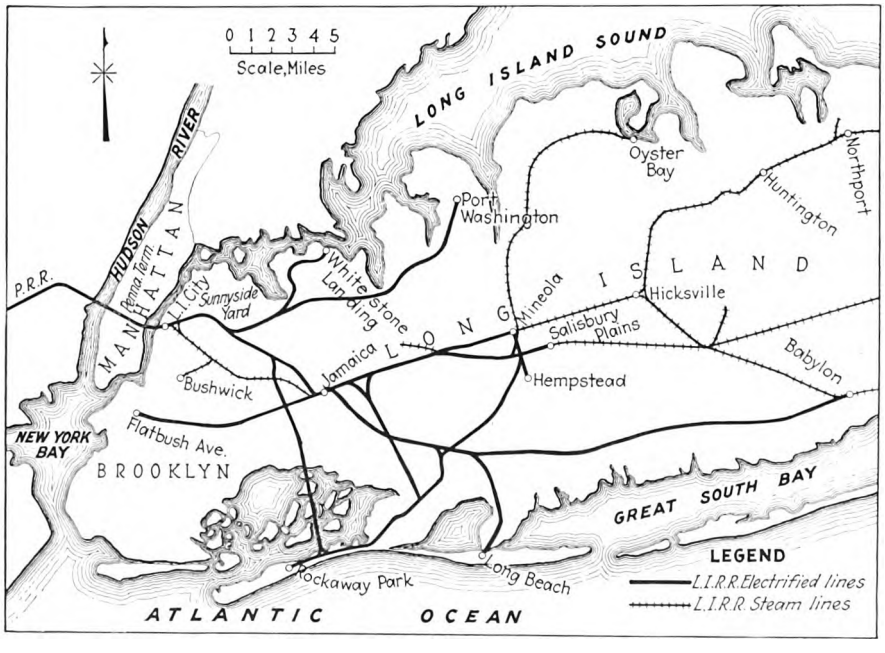
The reasons why these railroads have electrified afford perhaps the best explanation of the conditions under which it is possible and desirable to furnish electrified suburban service and explain also in a measure the reasons for adopting the type of system used. Tunnel operation was a large factor in all the earlier installations, and legislative enactments in addition gave some of the roads no other choice, making electrification of the suburban service incidental to electric operation of the terminal, including terminal movements of through trains.

Long Island Railroad Handles Heaviest Traffic

The original Long Island Railroad electrification was made in connection with the depression of its tracks serving the Atlantic Avenue terminal and the substitution of tunnel operation for surface operation with the attendant grade crossings throughout the Borough of Brooklyn. Later, coincident with the construction of the Pennsylvania Terminal in Manhattan, the tunnel entrances to this terminal precluded the use of steam, and the electric service was extended to include this terminal and the additional suburban routes served from it. Further recent expansion to include all the branch lines carrying passenger service in Greater New York has placed the Long Island in the very front rank of electrified steam roads. No other railroad in this country, steam or electric, handles so many commuters daily as does the Long Island, which has more than 100,000 commuters riding daily each way. More than 60 per cent of its entire passenger traffic is of this nature, and during the rush hour, for which equipment and all facilities must be provided, nearly 100 per cent of the traffic is of this character. The total daily movement consists of more than 870 trains, many of which are of the maximum length of eleven cars. In the summer months these trains carry more than 300,000 passengers per day.

Trains on this system are made up of motor cars and trailers, up to eleven cars per train. Motor cars weigh approximately 58 tons and are equipped with two 225-hp. motors and compose at least 70 per cent of the train make-up. All cars are of steel, of standard vestibule design, and the latest types of a seating capacity for 80 passengers each. With the receipt of those now under construction this road will have approximately 1,000 passenger cars equipped for electric operation. Electric energy required for this service is supplied from the Long Island City power station of the Pennsylvania system.

The New York Central and the New Haven, as joint occupants of the Grand Central Terminal and its approaches, were obliged by an act of the New York State Legislature in 1903 to substitute within five years some form of motive power other than steam for the operation of the Park Avenue tunnel. The New York Central decided to elec-



Dense traffic is handled on the Long Island Railroad's network of electrified lines

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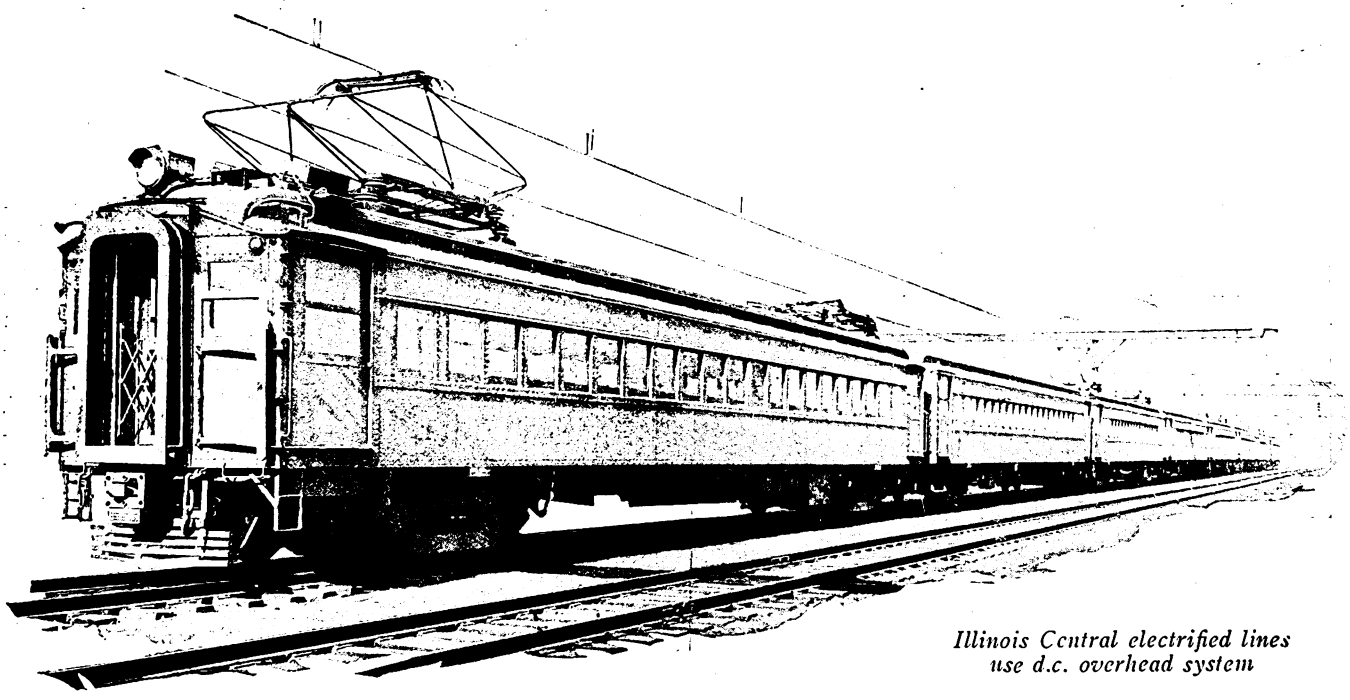
trify this terminal, together with those parts of the two main routes of its system which served the suburban territory. The system adopted was the 650-volt d.c. third rail. Suburban service, which now extends to Croton on the main line and to North White Plains on the Harlem division, is handled with multiple-unit motor cars, equipped with two 200-hp. motors. Some trailers were originally used, but these have since been equipped with motors, making a total at present of 325 motor cars in this service. The latest type cars are of steel, weighing approximately 65 tons each and seating 100 passengers. Train make-up varies from two to twelve cars. Energy for this electrification is entirely supplied from the railroad's own generating stations.

Suburban service on the New York, New Haven & Hartford Railroad system from New York terminates at several fairly large communities distributed along its main line, New Rochelle, Port Chester and Stamford. Steam locomotive terminals were maintained at these points for this service prior to electrification. Two courses were open to the New Haven in connection with its use of the electrified Grand Central Terminal. It could establish an engine change terminal at Woodlawn, where its line joins the Harlem division of the New York Central, and haul all trains from there by means of 600-volt d.c. locomotives, or it could electrify its own line to include all of its suburban service. Investigation of the first course showed that it would be very costly to acquire the property necessary for such a terminal, which would be adjacent to highly improved park and residential areas, and that such a terminal would create intolerable delays to the suburban service, especially during rush hours, for the power change. Further, the number of motive power units required would not be appreciably less than would be required for the complete electrification of the various suburban services involved, so that the latter course was clearly indicated and was decided upon.

It would have been perhaps the easier course to have followed the plans of the terminal company and to have adopted the 650-volt d.c. system, but the New Haven executives foresaw the necessity for selecting a system which in the future could be extended to include all classes and requirements of railroad service, heavy through passenger, heavy main line freight, and the operation of large terminal freight yards, as well as the suburban passenger service. It was this prospect which, after careful consideration of the various systems available, led to the adoption of the 11,000-volt, single-phase a.c. system for electrification.

For that time it was a bold move and much pioneering work was done in the early years of operation, but there have never been any doubts in the minds of those responsible for its operation concerning the wisdom of the choice made. Today the successful electric operation of more than 650 miles of track covering more than 150 miles of route, over which all classes of service operate, from the 4,000-ton freight train to the single motor car; from the high-speed 180-ton locomotive, with the all Pullman limited, to the 80-ton switcher, with its drag of freight cars in the yard, places the New Haven electrification foremost in the world, not only on account of the magnitude of the traffic electrically handled, but also because it is the only electrified system on which all these classes of service are being electrically operated at the present time.



Illinois Central electrified lines use d.c. overhead system

Because of the large investment in new passenger equipment for suburban service just prior to the electrification, this service was handled for some years after the inauguration of electric operation by means of electric locomotives. Motor cars and trailers with multiple-unit control have gradually been substituted for this service, until at present there are 63 motor cars and 104 trailers in this service, which take care of practically all the New Rochelle and Port Chester business, as well as a large part of the Stamford business. All cars are of steel and, with the exception of six, are equipped for operation on the 650-volt d.c. third rail of the Grand Central Terminal, as well as for the 11,000-volt main line. The latest motor cars are of dimensions approximating the standard steel vestibuled railroad coach, weigh approximately 87 tons each and have a seating

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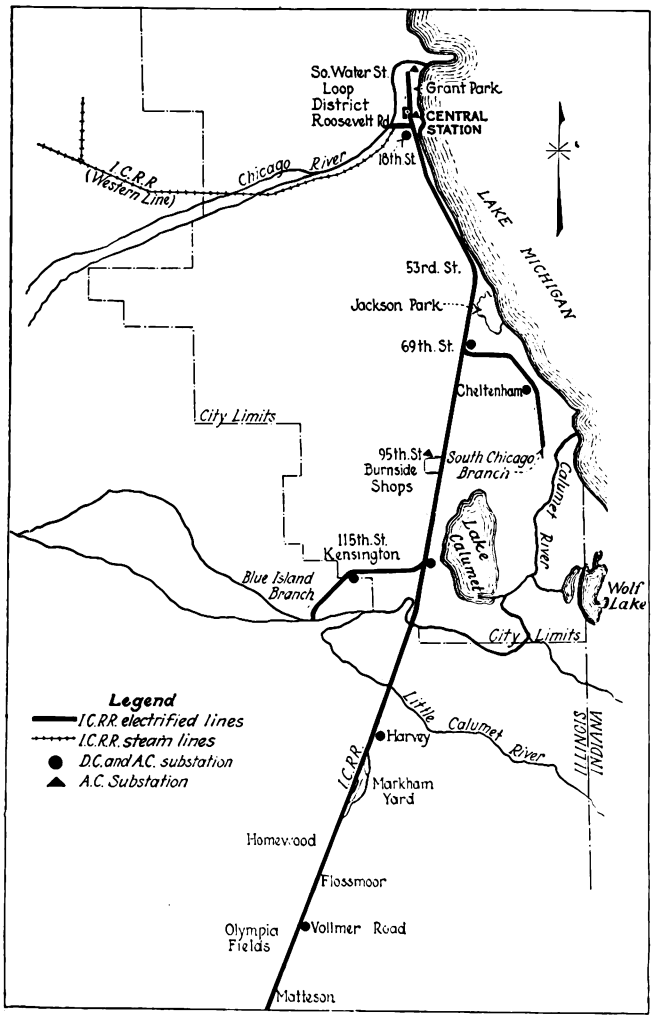
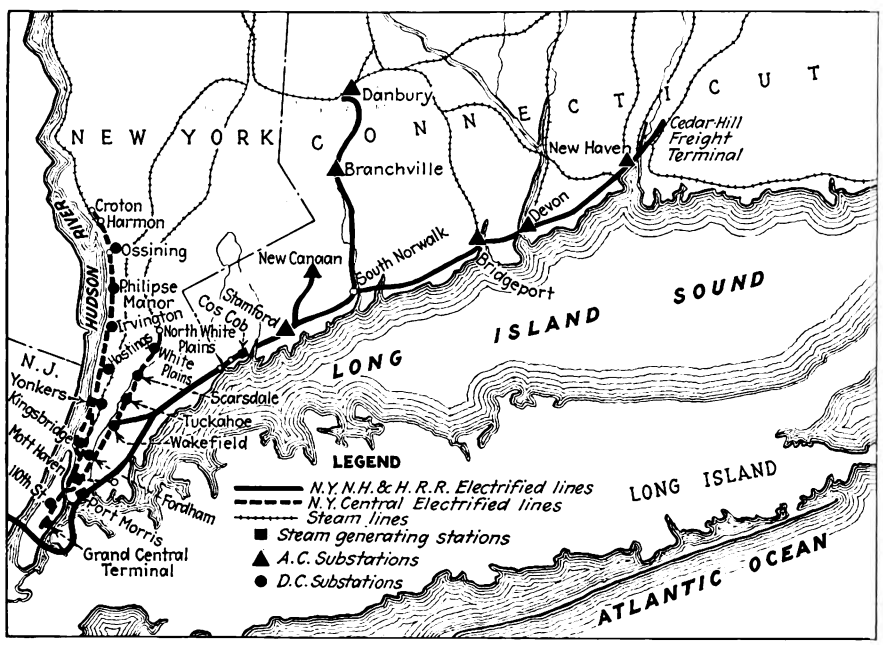


Traffic in Chicago suburban zone of Illinois Central Railroad is handled by multiple-unit electric equipment

capacity of 120 passengers each, with a three and two seat arrangement. Each motor car is equipped with four 175-hp. motors and is capable of hauling two trailers



Electrified lines of the New Haven and New York Central railroads serve an extensive area in New York and Connecticut

Trains up to ten cars are made up in the proportion of at least 33 per cent motor cars.

Considering the large seating capacity of these cars and that one motor car operates two trailers, the total weight per passenger is very light, notwithstanding the fact that the motor car must carry both a.c. and d.c. control apparatus. All cars are of course lighted and heated electrically. The energy for this electrification is supplied partly from the railroad's own generating station and partly purchased.

The Southern Pacific, New York, Westchester & Boston and Staten Island electrifications belong properly in the category of rapid transit lines and are mentioned merely to show that the steam railroads of which these systems are subsidiary lines have availed themselves of all the advantages that electrification gives to this type of service. In each of these instances the choice made of system of electric traction was largely governed by the other systems with which they connect at present, or may connect in the not distant future.

Pennsylvania Railroad Electrification
Relieved Congestion

For several years prior to 1914 the Broad Street Terminal of the Pennsylvania in Philadelphia was congested by suburban traffic. Electrification was decided upon to relieve this terminal congestion, to include first the main line suburban service to Paoli, which was effected in 1915, and later the service on the Chestnut Hill branch, which was completed in 1918. Multiple-unit cars were adopted for this service, and by their use train movements through the throat of this terminal, where the congestion was the greatest, were reduced between 16 and 20 per cent, due to the fact that the movements of the steam locomotives to and from their terminal beyond this throat were entirely eliminated. Further, because the multiple-unit cars were ready for departure very soon after their arrival, the terminal capacity was increased by the equivalent of two additional platform tracks, or 12½ per cent. This increase in terminal capacity and relief from congestion has been sufficient to take care of the growth during the past twelve years, and has postponed for this period the large increase in terminal capacity and the major changes to this terminal now being contemplated by the Pennsylvania. Plans are now made, and construction is already under way for the similar electrification of the suburban service on the main line south to Wilmington, as well as on the Westchester branch.

Choice of the 11,000-volt, single-phase a.c. system of electric traction was, as in the case of the New Haven, not based so much upon the suburban requirements alone as on its being the system best adapted to the future general electrification plans of the railroad.

Cars used in this service are of the standard type of Pennsylvania steel coach, re-equipped with one new truck, on which are mounted two 225-hp., single-phase motors, with multiple-unit control. A total of 138 cars so equipped are now in operation for this service. The

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seating capacity is 68 passengers per car, and the weight, with equipment, is approximately 60 tons. No trail cars are operated in these trains, which are made up of from two to eight cars. All the power for this service is purchased from the Philadelphia Electric Company.

Illinois Central Electrification Uses 1,500 Volts D.C.

The most recent steam railroad suburban electrification is that of the Illinois Central, in Chicago, which was placed in regular service in August, 1926. For many years this railroad has operated a frequent steam train schedule for the heavy suburban traffic which has been growing on its main line as far south as Matteson, and on the South Chicago and Blue Island branches which join the main line at Kensington and 67th Street, respectively. In 1919, by agreement with the City Council of Chicago, the Illinois Central committed itself to the electrification of this suburban service prior to February, 1927. After a study of the various systems available, the 1,500-volt d.c. system was selected on the basis "that it was a terminal electrification only, with no prospects for immediate extension over adjacent main line divisions." Energy is collected from an overhead contact system. Notable improvements over the former steam service have been effected by means of electrification. The running time between terminals has been decreased from 10 to 24 per cent and the service has been greatly improved not only by faster and more frequent trains but in the matter of greater comfort and safety to the commuter, as well. The magnitude of the service provided for is shown from the fact that 482 trains are operated each weekday, carrying a daily average total of 80,000 revenue passengers. In addition to the above, 72 trains of the Chicago, South Shore & South Bend operate each weekday over this system from Kensington into the terminal.

This traffic is handled entirely by 130 motor cars, to which are permanently coupled one trailer each. These cars seat 84 passengers each. The motor cars weigh approximately 70 tons and the trailers 44 tons. The former are equipped with four 250-hp. motors and trains are made up of from two to eight cars. Energy for this service is all purchased on a 1,500-volt d.c. basis from the Commonwealth Edison System.

As compared with the through traffic which usually shares the same terminal, suburban service fails to bear anything like its proper share of the cost of facilities required and used. Cars, tracks, terminal space, power supply, transmission and distribution systems, signal systems; in fact, all facilities must be provided for the maximum peak demand, which is out of all proportion to that of the through traffic.

Thus, the load factor is poor. It means that a large number of cars and locomotives must be idle from the morning rush hour until used again during the evening rush hour, and then remain idle again through the night. Terminal tracks and leads must be of a capacity to handle this peak traffic, even to the extent of signaling and using inbound tracks for outbound service, and vice-versa. Signaling is more expensive, blocks must be shorter for the short headway required to handle the business.

Yard outside Pennsylvania Station, New York City, the western terminus of the Long Island Railroad

Load Factor Poor in Suburban Service

Power supply and transmission and distribution systems must be designed for the peak loads. In the case of the earlier roads to electrify, the power demands could not be economically secured other than from railroad-owned generating stations. The roads which were obliged to make these heavy original investments for power supply have not yet found it desirable or economical to give up the use of these stations in favor of purchasing all their power, because of the high total demand charge which would result until such plants are amortized. Of late years, the development of large capacity central power stations has been so rapid that railroad demands, however large, are small in comparison with the average central station loads. Thus the power-producing companies are in a more favorable position to supply the railroad demands, and it may now be more desirable for the railroads to purchase all their power rather than make the heavy capital investment for a supply of their own.

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What Leading Exec

Meeting the Demands for

P. S. Arkwright

President
Georgia Power Company
Atlanta, Ga.

THERE is a demand for better transportation, and meeting this demand is the job ahead of the electric railway industry. The progress made during the past few years is remarkable, but we must be prepared for still greater changes in the future. The desires and wishes of the public must be met. We must accept this as the cardinal principle of our success. It applies to us as much as it does to the dealer in shoes or cigarettes or structural steel. And the desire of the public is for quality transportation, a better quality than we have been providing. The great number of automobiles on our streets is all the proof we need that the public wants better transportation, that it is willing to pay a price far in excess of the fare we have asked, and that we have been negligent in permitting the automobiles to capture so large a place in a field which formerly was almost exclusively our own.

How to meet this demand is our problem. Is it through a more luxurious vehicle? Is it through a different type of vehicle? Is it through extension of supplemental motor coach facilities to give our service some of the range and flexibility which are among the chief attractions of the private automobile? Or is it through some entirely new idea in public transportation yet to be developed? These are questions which only the future can answer. I have faith that they will be answered, for I have faith in the industry and in the men at the head of it. But, with all this uncertainty as to the future, there is one thing that can be said now, positively and with conviction. There is no place in the industry for the hidebound executive. There is no hope for the executive with plodding horse car ideas in this high speed era. Those who are capable of meeting the demand for modern transportation by modern methods will succeed. Those who attempt to meet it with antiquated equipment and antiquated ideas are doomed to failure.

J. H. Hanna

President
Capital Traction Company,
Washington, D. C.

I HAVE felt for some time that competition with privately owned automobiles can be met only by furnishing, at a reasonable but sufficient price, facilities which are more convenient and comfortable than can possibly be furnished at prevailing street car fares. Our experience with the 25-cent parlor car bus, while not particularly encouraging financially, has shown that such a service is popular and meets a very general demand. Its success depends on its superiority over first-class street car service. Operators must be men picked for their courtesy, equipment must be comfortable and even luxurious, and no standing should be permitted. These facilities cannot be furnished for 25 cents if the route is more than 6 miles. Equal facilities could be furnished by electric cars, but no advantage in the way of increased speed could be provided on city lines.

Robert I. Todd

President
Indianapolis Street Railway
Indianapolis, Ind.

CONFRONTED as the industry is to-day by the keenest kind of competition from the privately owned automobile and the independently operated bus, the two big things to be accomplished seem to be the rendering of such street railway service as will attract the bus rider to the street car and persuade the owner of the automobile to use the street car instead of his automobile.

If this result is to be accomplished the street car must be made as attractive as possible in point of comfort, safety and speed. Better seats, such as those of the bucket type; improved trucks and running gear, clean, fresh paint and good maintenance, all appeal to the traveling public. Improved power supply reduces the running time, particularly in rush hours.

Decreased earnings, which have been experienced by some of the companies throughout the country, make it difficult to expend large sums for equipment, but the present equipment should be improved in every way

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utives Think on

Better Transportation

possible to make the cars more comfortable and attractive.

It is conceded that where buses are needed to supplement the street car service they should be owned and controlled by the street railway company so that the service may be coordinated. The running of certain street cars or buses without stops as an express service to distant points, followed by local service, is being considered in many of our cities.

There is no doubt that there are opportunities for improvement of the street railway service in every city, and a constant study of these conditions is bound to improve the service and increase the number of riders.

T. E. MITTEN

President
Mitten Management, Inc.
Philadelphia, Pa.

WHERE the city transportantion system has fallen short of success you will find that it has failed to keep its product on a par with the advancing tastes of its customers. The growth of the seat-for-a-fare motor bus and the door-to-door taxicab is not an accident. It is the expression of that same popular longing for greater comfort exemplified in those great American institutions, the bathtub and the automobile. Public transportation systems must develop according to this public taste or go to the wall. They must not only go into the bus and taxicab business, but must increasingly approach "a seat for every passenger" as a standard in street car and subway-elevated service.

T. FITZGERALD

Vice-President
Pittsburgh Railways
Pittsburgh, Pa.

FACTORS which affect the patronage of transportation systems are appearance, speed, comfort, convenience, reliability and economy. If the prestige of a street railway and its public relations are sufficiently good, there is no physical reason why street car service should not be reasonably speedy and also offer the best in appearance, comfort, reliability and convenience at a price greatly below the cost of any other form of transportation.

Few street railways under present-day conditions can compete with private automobiles in appearance, speed, comfort and convenience; but, so far as reliability and economy are concerned, street car service greatly excels. Because lack of credit makes unavailable the large sums of money necessary to improve these factors, many former street car patrons are using private automobiles. These private facilities are using the highways to the disadvantage of all forms of mass transportation facilities to an increasing degree. The immediate problem seems to be to furnish a mass transportation service that will offer effective competition with the private automobile and to such an extent as to reduce congestion and interference with the street cars.

This competition should probably take the form of a special service as nearly comparable to private car service as possible, and must, of course, be performed at a special rate.

In the matter of economy the street car has a tremendous advantage, and if street railway managements can improve in the other elements mentioned, as I believe they can, the earnings, prosperity and service of street railways of the country will win out over the automobile competition that is now affecting them so seriously. After this competition reaches its peak street railway traffic should resume the upward trend apparent before the year 1924.

W. E. WOOD

President
Virginia Electric & Power Company
Richmond, Va.

LOCAL low-fare basic transportation service is essential to the welfare, growth and comfort of all cities of any considerable size. The widespread use of private automobiles with their many attractive qualities has had a tendency to cause the riding public to misunderstand the usefulness and essentiality of our basic transportation systems. The difficulty of earning a reasonable return on our investment in these systems has caused us to fail to keep pace

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with the added and increasing comforts and attractiveness of the private automobile. There are many transportation requirements that our systems can fill more conveniently, comfortably and economically than the private automobile, and these riders, enough to assure successful and growing systems, are the ones we must hold or attract.

To do this it is necessary to provide not only good but attractive service and strive constantly to improve this; then, sell the good quality, convenience and economy of our service to the riding public. At the same time convince the general public of the value of our service to the welfare of the community and that our company and its employees are valuable citizens. Our equipment must be made attractive, comfortable and noiseless; our tracks smooth; our men efficient, courteous, clean and alert; both speed and safety must be obtained and the service must be sufficient and regular. Ingenuity in design and operation in keeping ahead of the trend of the times will keep our important place in the scheme of affairs and ultimately assure a warranted prosperity.

DEL A. SMITH

General Manager
Department of Street Railways
City of Detroit, Detroit, Mich.

AS TO the most pertinent factors in meeting the demand for better transportation, I will say that the imperative need of the industry today is more "Ponce de Leons" in the operating personnel. Our antiquated methods and ideas, inherited from the old school, must be immersed in "the fountain of youth." After this process of rejuvenation, we are then ready to consider the four cardinal attributes in the popularization of the transportation system, namely: accessibility, dependability, speed and comfort.

As the picture presents itself to me, the proper co-ordination of these qualities, together with the versatility of the operator in adapting himself to new ideas, is the only sure method of increasing patronage and winning favor in the ever-changing mind of the public.

D. W. HENDERSON

General Superintendent of Railways
Seattle Municipal Street Railway
Seattle, Wash.

THROUGH careful observation it is my opinion that the street railway industry is coming back into its own—perhaps not in all cities but in the majority of them. One cause for this is the automobile congestion and the difficulties in finding parking space in most of our cities.

The following are a few of the possibilities which should tend to improve and build up the industry:

First: New light-weight cars with exit and entrance built as low as possible in order to save time in the loading and unloading, seats upholstered and arranged for the convenience and comfort of passengers, cars properly geared and equipped with sufficient power to increase the speed over that of the present cars and equipment painted so as to be attractive to the public are all very necessary.

Second: Companies should take the public into their confidence and give it data as to railway conditions. They should also educate the public into realizing that without the street car industry the cities would not develop and grow by leaps and bounds as some of them have in the past.

Third: It is now a demonstrated fact that bus operation should be coordinated with the street railway in such a way as to give regular and dependable service, using the best kind of equipment on the market and making direct connection with street cars at transfer points.

Fourth: Street railway companies should be careful not to raise the fare to the point where it might discourage the public from riding the cars. We would say that any fare averaging more than 8 cents would be prohibitive, except for interurban service.

A. W. MCLIMONT

President and General Manager
Winnipeg Electric Company
Winnipeg, Man., Canada

WITH the ever-increasing measure of comfort afforded by motor buses, and automobiles in particular, a new mark has been set for all transportation agencies to note and to endeavor to copy and surpass if possible. Apparently the riding public is not so much concerned with the cost as it is with the standard of service, and this is proved by the increasing number of higher priced automobiles which the public is buying. The public looks for speed, comfort and convenience in transportation, whether by automobile or by street car. The quality of service appears to be more important than the fare.

The problem before the street railway industry is: How can these qualities in service be attained? To me it seems that there must be an improvement in the construction of our street car tracks. A good deal of the track installed in the past is too light to serve present-day transportation needs. The rolling stock in many

cases has been too heavy. Unnecessary car stops must be eliminated. It is not too much to expect that in the near future a street car will be developed that will embrace most of the features of comfortable riding which are found today in the de luxe motor buses. From my experience I am convinced that the people will willingly pay a fare commensurate with the standard of service given.

Analyzing the reasons why so many street car patrons have turned to automobiles, we find that one of the principal reasons is facility of travel.

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This element of competition must be met by street car operators speeding up service in every way possible, and where practicable providing supplementary bus lines. In the speeding up of electric railway service car manufacturers have an opportunity to develop lighter and more flexible vehicles—cars which are able to accelerate quickly and which can be brought to a quick stop.

F. G. BUFFE

Vice-President in Charge of Operations
Kansas City Public Service Company
Kansas City, Mo.

CERTAINLY the industry can report progress in its efforts toward meeting the demand for better transportation. From every quarter come reports of rehabilitation and modernization. The old complaint that street railway operation was in a rut certainly cannot now be made. There has been a mental modernizing as well as a physical. However, the industry is not yet in the position of Alexander the Great, who wept because there were no more worlds to conquer. There is still much to do to carry on the program now started, as well as to venture into the field of new and comparatively untried ideas.

The public has accepted the fact that nothing can supplant street railway service for mass transportation. Very seldom nowadays is this fundamental dispute. Better service with modern equipment is being met with approbation, good will and increased riding. Aggressive advertising campaigns are being conducted. The bus is being fitted into the scheme of things, and is taking its place as the vehicle for supplying a preferential seat for every passenger service for the more exacting. At least two large companies are in the cab business. In every direction we have seen street car men become transportation men over night, constantly planning to fit urban transportation to the needs and demands of the people, and supplying services other than the low fare, base service wherever demanded and supported.

One-man operation on heavy lines in large cities is a success, and like all labor-saving inventions it must be adopted in the end. No community and no transportation system can afford to pay two men for a job that one can handle. One-man operation makes possible increased frequency and decreased loads, which brings us another step nearer the ultimate goal of a seat for every passenger.

When the very best possible service is given for the fare paid, the next step is to determine in each community whether or not the people are primarily interested in the very lowest fare and ordinary, good service, or in the very finest service money can produce at a slightly increased unit cost. The American people in every other direction have placed the emphasis on service and quality, with price secondary. It is very possible that this attitude will develop in transportation.

GEORGE BAKER ANDERSON

Manager of Transportation
Los Angeles Railway
Los Angeles, Cal.

IF YOU enter a grocery store and ask the proprietor for applesauce, and he informs you that he has no applesauce but can give you some excellent cream cheese, you will be inclined to think in the vernacular, "Rotten management!"

But if he has the applesauce, and if you pay for it, assuming that it is good, fresh applesauce, only to discover upon tasting that it has turned sour, or has been made of partly decayed apples, you will have even greater warrant for concluding, "Rotten!"

The needs and desires of those who, either through choice or necessity, expect a public transportation company to deliver what its customers want and not attempt to foist unwelcome substitutes upon them must be met as nearly as possible by the seller if he aims to attract trade. His applesauce must be at least acceptable to the palate. Otherwise some of his customers will quit him, and those who stick will do so because of dire necessity, not because they like his wares. I know of nothing that will build up and popularize a transportation system more quickly and more surely than a satisfactory response to the public demand.

We can be courteous as we hand over the article purchased, and we can be sure that it will be difficult for the purchaser to find a much better article elsewhere.

Then as to speed—it *must be made*. Unnecessary congestion is very an-

noying and also costly and when fully understood by a community will not long be tolerated.

Above all other factors in meeting the demand for better transportation, conceding that progressive transportation managers are in accord on the essentials within the purview of corporate management, is leadership of the public—enlightenment and leadership.

RICHARD MERIWETHER

Vice-President and General Manager
Dallas Railway & Terminal
Company, Dallas, Tex.

IT IS difficult to discuss the outlook before the street railway industry and the matter of meeting the demands for better transportation without being conscious of the credit situation which has confronted the street railways for the past ten years or more, due to the difficulty of meeting the ever-increasing cost of operation while subject to the control of regulating bodies hesitant always to grant adequate fares, and, in addition, the

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constant inroads of the private automobile on the business of the street railway.

During this period the street railway operator has had to contend with that vicious circle of circumstances wherein he could not secure new capital for necessary improvements to meet the demands for better transportation, due to insufficient net earnings. On the other hand, he could not increase his net earnings by reason of the fact that he could not obtain new capital to improve his property and meet the new and changing conditions in the transportation field.

As I see it, those street railways that have not already done so must first obtain an adequate fare, which, of course, will result in establishment of credit and earnings sufficient to rehabilitate the properties. This will mean the rebuilding of tracks and the scrapping of antiquated equipment, which must be replaced by inviting and comfortable cars.

The bus will constitute an increasingly effective and useful vehicle for public transportation. Especially will this be so for furnishing express service into outlying districts, which will meet a demand that surface cars cannot do. Through the use of a combination of buses and street cars, the former to render a special and improved type of service at a higher rate of fare, and the street car to meet the mass transportation situation, the local transportation companies should be in a position to furnish the variety and kind of transportation desired by the public.

D. W. Pontius

Vice-President and General Manager
Pacific Electric Railway
Los Angeles, Cal.

IN STATING my views concerning the outlook of the electric railway industry I am reminded of the story concerning a young lieutenant who was recommended to Napoleon for promotion because of rare skill and courage he had exhibited in a battle a few days before. "Splendid," the great Napoleon is said to have replied, "but what did he do the next day?"

More than ever before is impressed upon the wide-awake electric railway management the fact that there can be no resting upon past laurels and achievements. The well-being of the industry depends upon our advancing with the times.

The Pacific Electric Railway from

its inception has carried upon its emblem "Comfort—Speed—Safety," and I know of no other three elements now so essential to the industry.

For comfort of patrons constant consideration must be given to improvement of car design, taking into account factors of boarding, riding and leaving cars. Whether in electric cars or motor coaches, the trend is toward more comfortable seats, the modern automobile having created new ideas of comfort.

Further, the automobile has developed a greater desire for speed, and nothing should be left undone to shorten schedules. The matter of a few minutes' running time is a factor that will cause thousands to decide whether they will use their private automobile or the street car.

Safety is the one feature in which electric railways have kept abreast, and the use of steel equipment, wherever possible, together with modern signals and safety appliances, is a necessity with which we are all acquainted.

"Comfort—Speed—Safety" are the three factors that are ever before the officers of this company. In my judgment they constitute today, more than ever before, the elements most essential in "Meeting the Demand for Better Transportation."

H. S. Robertson

President
Denver Tramway Corporation
Denver, Col.

SOME form of mass transportation is a necessity. That fact is indisputable. The meeting of this demand without financial loss and with a reasonable profit is the problem.

The public and governmental authorities have a clearer and more comprehensive understanding of the situation than existed a few years ago and, while there remains much to do in an educational way, the fact that the average fare is now approximately 7.9223 cents, and in many localities unjust burdens such as paving have been removed, warrants the conclusion that not only has the necessity for mass transportation been recognized but also the fact that it cannot be rendered except upon a sound business basis.

Traffic congestion, coupled with more stringent parking regulations, will make the use of the private automobile less convenient. Convenience, rather than expense, seems to be the important factor with a large number of people, and in view of this the opportunity is now at hand for the industry to demonstrate that mass transportation facilities are not only the safest and most comfortable but, under present conditions, the most desirable and convenient.

In order to accomplish this the business must be conducted in the light of these changed conditions. This involves rendering adequate service, which from the standpoint of the public means good track and that equipment be kept clean and neat in its appearance, and made as easy riding and noiseless as possible. In other words, I do not believe the

public expects extravagant expenditures in this direction, but it does demand something that is up to date and that shows improvement and development, and a keeping up with the progress and advancement that transportation has made since the advent of the automobile.

The rate of fare must be sufficient to cover the cost of the service, and yet be held as low as possible consistent with proper and economical operation.

The industry must recognize that there are certain fundamental and underlying principles that are applicable to all companies, and the recognition of an unsound basic principle is not only poor business but affords those opposed to giving the industry a square deal the opportunity of citing the case as a precedent.

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Public Square, Cleveland, the midpoint of the Carnegie-Clifton double-deck bus line of the Cleveland Railway

Success of

Double-Deck Bus

Depends on Special Conditions

By J. H. ALEXANDER
President Cleveland Railway

OPERATION of buses is a necessary part of the transportation service which should be rendered by any street railway system in a metropolitan area. Buses do not and never can take the place of the street car for mass transportation, nor is it desirable that they should. It is our belief, however, that street railway managements generally should use buses for certain types of service, augmenting and supplementing rail service, and that by so doing the operation of their systems can be more efficient, economical and satisfactory to the public. Double-deck buses are valuable under conditions suited to their operation, but it must be admitted that their field of usefulness is limited.

The coming of the private automobile brought about a new period in local transportation in Cleveland, as it did generally over the country. The number of street car passengers carried in Cleveland during the years of 1900-1925 decreased steadily. Now it appears that the introduction of buses is causing a change in the riding habit. Instead of a decrease for the year 1926 as compared with 1925 there was an increase of 0.71 per cent in traffic.

The coming of the buses marks still another change—a transformation from the day when people own and operate their own transportation vehicles. The extent of patronage of the double-deckers, and especially the type of patronage, indicates that people are readjusting their habits of travel even to the extent of leaving their automobiles in the garage a good portion of the time. There is a growing discrimination as to how and when to use the bus, street car or private machine.

The double-deck bus line has not taken traffic away

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from street car lines notwithstanding that it parallels them within a block throughout its entire length of 9.68 miles. Much to the surprise of early guessers, street car lines paralleling the main bus route have increased in patronage at a time when some other rail routes showed a decrease.

For some time the double-deck coach line has been showing a very substantial profit, income per month varying between 50 cents and 56 cents per coach-mile.

Analyzing the reasons for the ready acceptance of double-deck bus service and their constantly increasing popularity, certain points are apparent. The speed at which the coaches are operated, namely, between 12 and 13 m.p.h. during the base hours and approximately 11.5 m.p.h. in the rush hours, constituting what is probably the fastest double-deck line operation in the country, is especially attractive. Safety has not been sacrificed. Although this speed may be detrimental to equipment we believe that the actual attractiveness to passengers is more than sufficient to cover any additional maintenance cost. Another factor which has been important in bus operation is the skip-stop system, stops averaging approximately six per mile. The fare on double-deck lines is 10 cents for a through ride, there being no zone system such as exists on the cars requiring passengers to pay additional fare after passing the Public Square. Free transfers are issued to passengers originally boarding motor coaches, which are good as full fare on any intersecting car or coach line. These transfers are accepted as full fare from intersecting coach lines, while a 2-cent additional charge is made from intersecting car lines, where the fare is 7 cents with a 1 cent charge for transfers.

The rule of a seat for every passenger was adopted at the time the double-deck route was established and was continued until the limit of the number of buses available had been reached. Then, due to shortage of equipment, it was decided to permit passengers to stand with a limit of five per coach. This rule is now in effect and in general seems to be giving satisfaction.

We believe that there is a future for trunk lines of the double-deck type, but these lines should be confined to districts in which patrons reside who are able to pay a higher fare, and for the most part to boulevards and streets not having car lines. There is also a future for double-deck operation on lines running through parts and sections of the city of interest to visitors.

Used at Buffalo Only in Rush Hours

At Buffalo, N. Y., the International Railway has found that double-deck buses are best used to supplement single-deck bus service during rush hours. The one route on which double-deckers are used serves Delaware Avenue from Church Street through Buffalo and the adjoining village of Kenmore. Delaware Avenue is a high-class residential street, many large estates bordering on it. At its southern end is a specialty shopping section, while in the village of Kenmore there is a thriving local business center.

Riding, however, has not been heavy enough to warrant service more frequently than at ten-minute intervals, except during rush hours. Furthermore, climatic conditions in Buffalo are not favorable during nine months of the year for operation of open or semi-inclosed double-deck buses. As a result the International Railway began on Aug. 14, 1927, to operate single-deck buses at more frequent intervals but supplemented during rush hours by the double-deckers.

Popular for Chartered Trips in Atlanta

Establishment of double-deck bus service in Atlanta by the Georgia Power Company provided high-class transportation to two residential sections with no car lines. Because of the bitter feeling that had existed the

Double-deck buses are used in rush hours on the Delaware Avenue route by the International Railway, Buffalo, N. Y.

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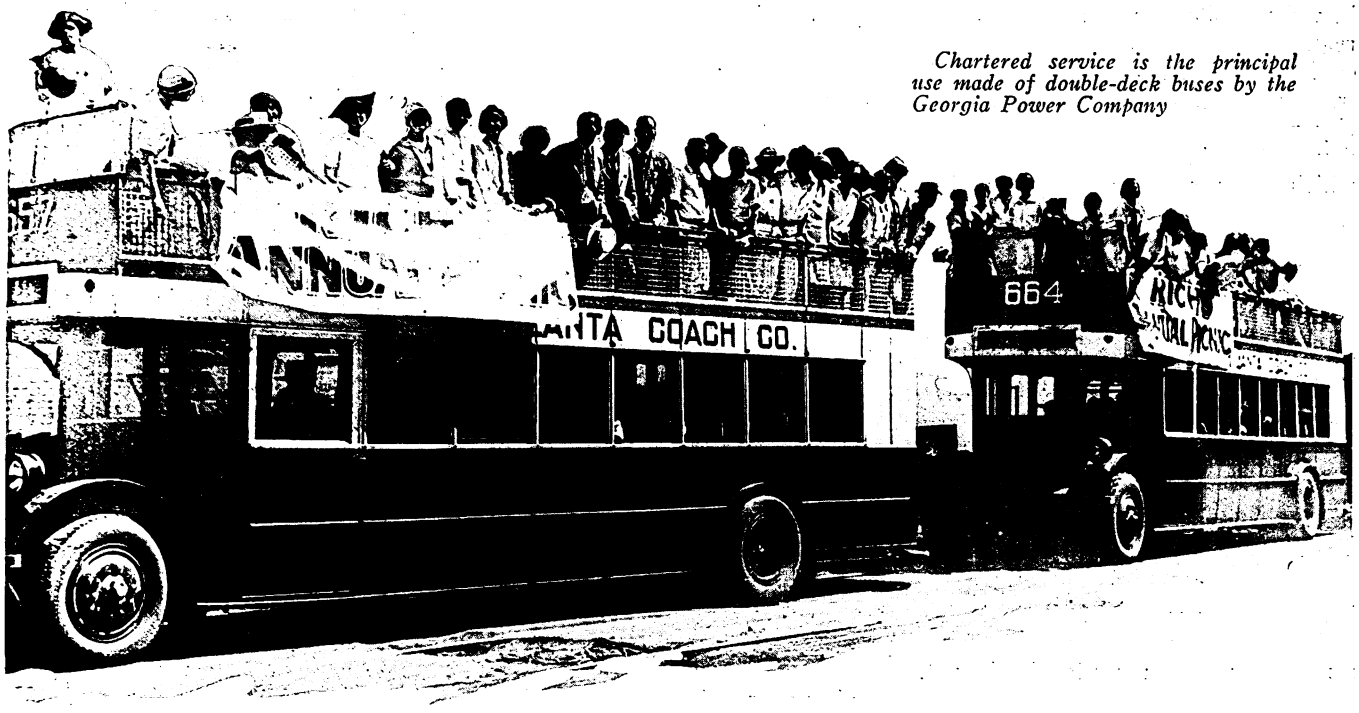

Chartered service is the principal use made of double-deck buses by the Georgia Power Company

company was influenced to select a coach of larger capacity than the actual transportation needs required, with hopes of building up sufficient business to justify their operation. After the first year, however, the loss was so great that it was necessary to substitute smaller coaches. Accordingly, ten single-deck coaches were purchased and used on the base schedules. The fifteen double-deck coaches are helping to carry the rush-hour crowds and are also much in demand, under a chartering arrangement, for picnic parties, convention delegations and other outings.

Baltimore Uses Double-Deckers on One Route

Operation of double-deck buses in Baltimore is confined almost entirely to the Charles Street route. That portion of the street over which the United Railways & Electric Company operates double-deck buses has the same significance that Fifth Avenue has in New York. At the northern or outer terminus of the bus line, about 3 miles from the center of the shopping district, there is a high-class apartment house development and Johns Hopkins University. Just north of the terminus of the bus lines is the entrance to Roland Park and Guilford, a fine residential section.

From a transportation point of view the section served by the bus line is adequately taken care of by a car line. However, a slightly greater convenience is provided in that the bus line remains entirely on Charles Street. The rate of fare on the street car is 7½ cents, with a 4-cent "half" fare, a 5-cent school ticket and a universal transfer system. The fare on the double-deck buses is 10 cents with no reduced fares or no transfers to street cars or other bus lines.

The operation on Charles Street is entirely double-deck, and with the exception of the summer months when travel is light the line uses eight on the base and eleven or twelve buses on the peak, with an eight-minute and a five-minute headway, respectively. In good weather the open-top buses are the more popular, but the semi-inclosed top is sufficiently satisfactory under that condition, and the advantage that the closed upper deck can be used to capacity during inclement weather more than justifies its use. For a climate such as Baltimore has there seems no justification for the expensive and heavy totally inclosed double-deck buses.

The following tabulation shows the number of passengers carried from 1915 to 1926 on the Charles Street line:

Year	Passengers	Effective	Fare	Additional Equipment
1915	484,800	July 25	5 cents	(Single-deck buses in use)
1916	1,438,900			
1917	1,515,000			
1918	1,950,300	Nov. 10	6 cents	
1919	1,958,900	Oct. 1	6.5 cents	
1920	2,026,300	Jan. 1	7 cents	
1921	2,165,100			
1922	2,214,600	July 1	10 cents	Four double-deck buses
1923	2,003,500	July 1		Four double-deck buses
1924	2,131,800			
1925	2,333,800	July 1		Six double-deck buses
1926	2,301,200			

Up to June 30, 1922, the accumulated deficit on this route was $136,960.61. When the fare was changed to 10 cents the line immediately became profitable.

The factors which make the operation profitable are: first, the 10-cent fare; second, the short route; and third, the comparatively good load factor. No attempt has been made to take care of all the peak-load traffic that could be obtained, as this function is left to the car lines. The comparatively low investment, together with the off-peak shoppers and moving picture and theater crowds, makes a profitable operation. In other words the bus line takes the cream of the business.

P. R. T. Has 250 Double-Deck Buses

Extensive use of double-deck buses by the Philadelphia Rapid Transit Company in Philadelphia has proved to be a success. Bus operation began in September, 1923, with ten double-deck buses that were placed in service on 5 miles of route on Roosevelt Boulevard. When all the new buses that are on order have been delivered the company will have 565 buses, of which 250 will be double-deck.

Three city routes and two intercity routes, the latter

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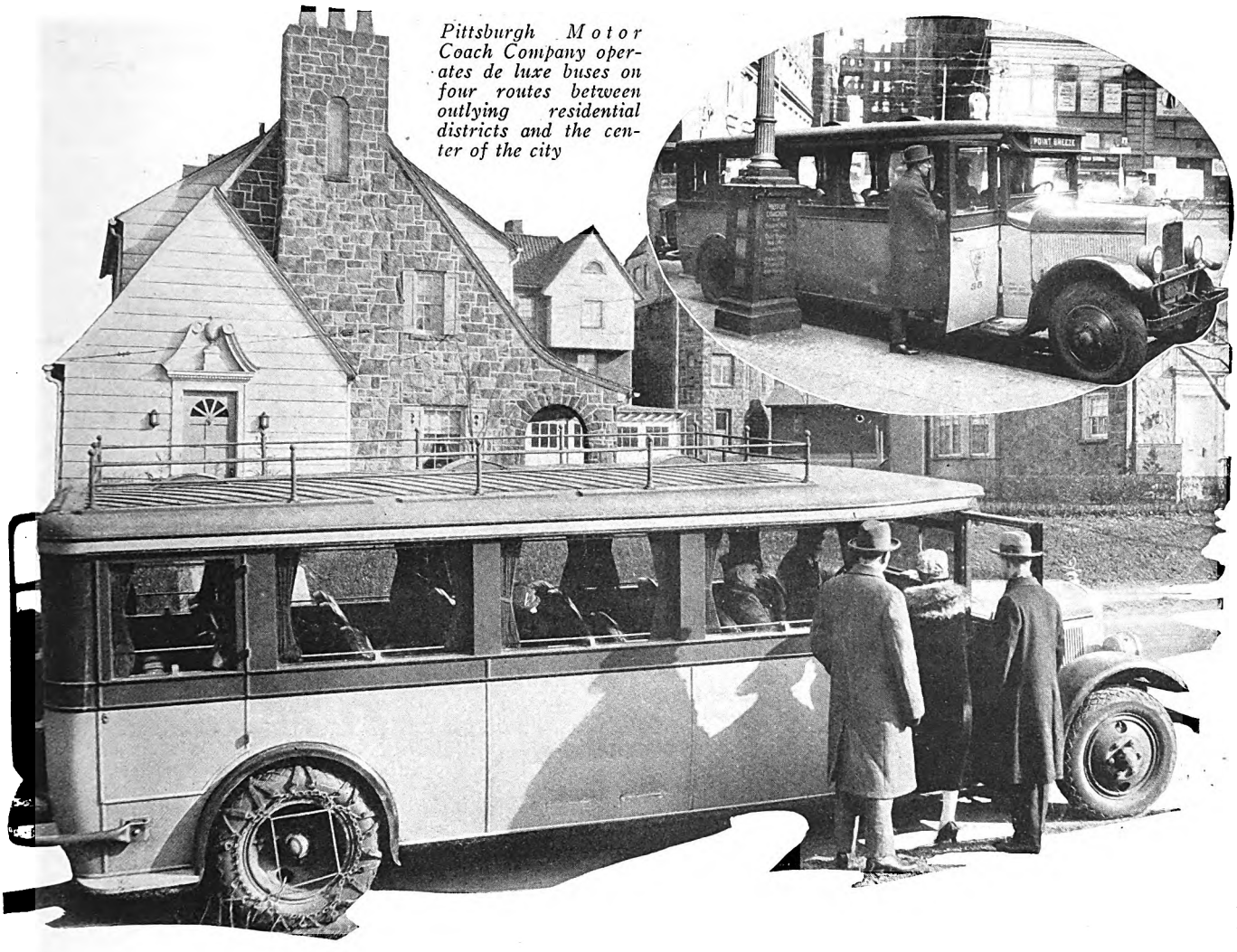

Pittsburgh Motor Coach Company operates de luxe buses on four routes between outlying residential districts and the center of the city

Winning the Automobile User With

De Luxe Coaches

By Thomas W. Noonan
General Manager Pittsburgh Motor Coach Company

HUNDREDS of electric railways throughout America have made extensive additions to their systems or replacements of rail service by means of motor buses operated at trolley fares or at little more than trolley fares. A few of these companies, like those at Pittsburgh, Toronto, Washington and Cincinnati, have also undertaken high-fare, de luxe coach service of express character. In many ways this is a most attractive proposition.

Pittsburgh's situation with respect to the operation of bus service is in a class by itself. A total of 15.8 single-track miles have been removed since the end of the receivership on Jan. 31, 1924. Most of this mileage was of the "hold the franchise" variety and the service over the routes abandoned has not been replaced by that of buses. More track is booked for abandonment in line with the city paving schedule. Here and there track has been doubled or connecting curves added, but outside of the loop on Diamond Street to alleviate downtown congestion, no new track has been built. The net situation is that the Pittsburgh Railways now operates a total of 592 single-track miles, serving more than 1,000,000 people, without a trolley-fare bus in regular service.

Three factors have made this unique situation possible:

First, the high proportion of trackage to population.

Second, the traction agreement with the city of Pittsburgh and most of the other municipalities served, which

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Table I—Earnings and Expenses of Pittsburgh Motor Coach Company

Earnings	Cents per Coach-Mile Jan., 1927	June, 1927	July, 1927
Passenger revenue	39.44	30.91	26.77
Special bus revenue	0.24	2.70	5.03
Advertising revenue	0.15	0.08	0.08
Total	39.83	33.69	31.88
Operating Expenses and Taxes			
Conducting transportation†	16.93	12.76	12.58
Maintenance of transportation plant and equipment	6.73	5.59	7.78
Traffic	0.05	0.47	0.43
General administration	1.56	1.84	1.72
Other general	1.85	1.75	1.62
Renewals and replacements	4.56	4.48	4.73
Total	31.68	26.89	28.86
Taxes	1.10	1.12	1.53
Total operation and taxes	32.78	28.01	30.39
Net earnings from operation	7.05	5.68	1.49

†Wages are 61½ cents an hour first three months; 66½ cents an hour next nine months; and 68½ cents an hour thereafter.

saves the management from the necessity of replacing track for the sake of avoiding unfair burdens. The company's obligation in lieu of paving and license fees is approximately $800 per mile of track. Public knowledge that the company's operations are continuously scanned by the Traction Conference Board and that its profits are limited to 6 per cent return on an agreed valuation reinforces the importance of this factor.

Third, the use of de luxe coaches at a 25-cent fare on short headways to give a service that will draw people from the private automobile and so help to clear the highways for business and trolley traffic. This operation is conducted by the associated Pittsburgh Motor Coach Company.

Both Trolley and Coach Are Self-Sustaining

The relative importance of the two classes of traffic can be gaged from the data for 1926, when the trolleys carried 396,697,675 passengers at an average fare of 5.37 cents and the coaches carried 1,149,283 passengers at a fare of 25¼ cents. The extra quarter cent comes from the higher average fare from chartered service. It is obvious that the difference in fare is great enough to produce appeals to widely different classes of patronage. Indeed, replies to our questionnaires prove that the coach traffic comes chiefly from private automobile riders, people who would otherwise not ride at all, taxi passengers and trolley riders in order of importance as named. The riders from the trolley are chiefly shoppers to whom the coach appeals as a pleasing variation from their usual shopping routine.

Table III—Summary of Operations of Pittsburgh Motor Coach Company

Route	Length Miles	Running Time—Minutes Inbound Peak	Inbound Base	Inbound Eve.	Outbound Peak	Outbound Base	Outbound Eve.	Headway, Min. Peak	Base	Eve.	Sat. Eve.
East Liberty	5.00	27	23	20	27	26	25	6	7½	15	..
Squirrel Hill	5.70	25	26	35	27	29	25	6½	11	30	15
Point Breeze	6.25	28	28	28	32	32	32	7½	12	30	..
Mt. Lebanon	6.90	33	31	30	37	34	30	10	15	30	..

Table II—Detail of Operating Expenses, Pittsburgh Motor Coach Company, June, 1927

Conducting Transportation	Cents per Coach-Mile
Superintendence of transportation—labor	0.52
Superintendence of transportation—supplies and expenses	.....
Garage employees	0.65
Garage supplies and expenses	0.34
Station employees	.....
Station supplies and expenses	.....
Passenger coach drivers and conductors	6.22
Fuel for passenger coaches	2.47
Lubrication for passenger coaches	0.04
Removal of snow and ice	.....
Transportation rent	1.89
Other transportation employees	.....
Other transportation supplies and expenses	0.02
	12.76
Maintenance of Transportation Plant and Equipment	
Superintendence of plant and equipment	0.20
Maintenance of passenger coach bodies	0.04
Maintenance of passenger coach chassis	3.34
General repairs	2.01
	5.59
Traffic	
Superintendence and solicitation	0.28
Traffic supplies and expenses	0.02
Advertising	0.17
	0.47
General Administration	
Salaries of officers	0.47
Salaries of office clerks	0.65
Officers and general miscellaneous office clerks' expenses	0.05
General office rent	0.12
Law expenses	0.11
Other administration supplies and expenses	0.44
	1.84
Other General, Including Renewals and Replacements	
Discounts on material and supplies credit	0.07
Renewals and replacements	3.92
Extraordinary renewals and replacements	0.56
Store labor and expenses	0.16
Injuries and damages	0.01
Insurance	1.49
Pensions and gratuities	0.01
Other general expenses	0.15
	6.23
Total operating expenses	26 89
Mileage	125,077

The reasons for developing the de luxe motor coach lines as we have done it in Pittsburgh were given in more detail than it is possible to give here, in a paper by the writer before the Central Electric Railway Association at its meeting last January. This was published in Electric Railway Journal for Feb. 12, 1927, page 298. In general, the lessons learned in our experience are that it is necessary to give the patrons a service which is sharply differentiated from ordinary street car service. Both in the design of the vehicles and in the matters of operation, such as routing, stops and schedule speeds, we have found this to be an essential to success.

De luxe bus service in the Pittsburgh district began with our acquiring from an independent operator a line joining the business and amusement centers of Pittsburgh and East Liberty. On Aug. 14, 1925, we originated a 5.7-mile route from downtown Pittsburgh to Squirrel Hill, a high-class residence district lying just beyond Schenley Park. For this service we installed 29

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and 25-seat buses. On May 24, 1926, we originated a 6.6-mile route to Point Breeze, another fine residence district. The vehicles put on were 29-seaters.

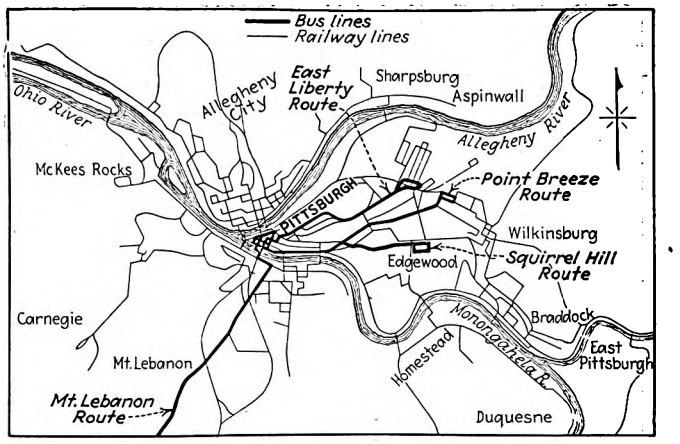
Both the Squirrel Hill and Point Breeze routes make use of 2 miles of boulevard terminating in downtown Pittsburgh. The Squirrel Hill route also makes use of Schenley Park and, in general, is not near trolley territory. The Point Breeze route, after leaving the boulevard, is on streets with railway tracks for a good part of the way.

Beginning on Dec. 6, 1926, we changed Point Breeze from 29-seat buses to 19-seat coaches. These coaches have a wheelbase of only 210 in. compared with the 225-in. wheelbase of the others. The over-all length is also only 24½ ft. against the 28½ ft. length of the older vehicle. The reduction of over-all width from 90 in. to 81⅝ in. has been found of substantial value in avoiding accidents and in getting by other vehicles. Because of the better clearance conditions and smaller capacity, we were able to cut the running time from 38 minutes to 30 minutes.

The most recent line to be established is that to Mount Lebanon and Dormont, which was opened on March 21 of this year. This route also serves a fine residential section.

The East Liberty route has the advantage of a business and amusement center at each end. Application has been made to extend the Point Breeze line to the Wilkinsburg station of the Pennsylvania Railroad. This extension would produce some two-way travel on that line. The Squirrel Hill route has been rerouted advantageously near its suburban terminus in order to serve a larger population.

Mileage, running time and headways for the present routes are given in Table III at the bottom of page 514. The running times shown do not include layovers. The routes themselves are shown in the map on this page.

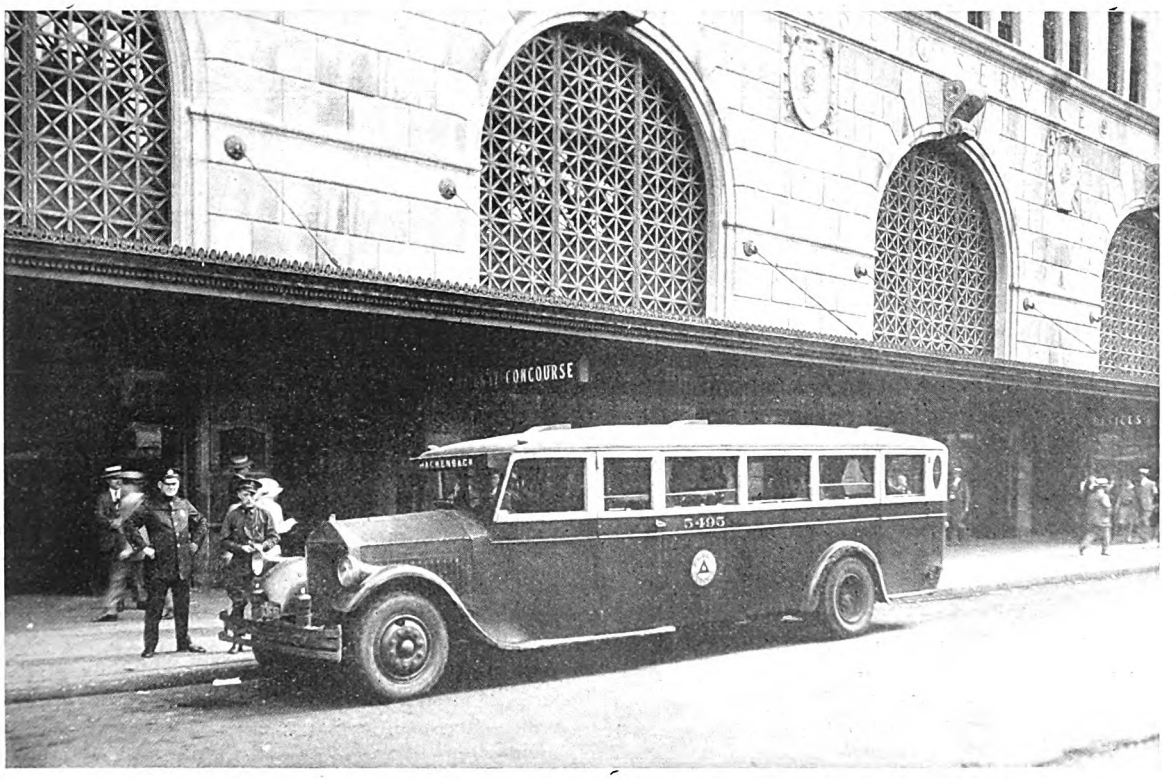


Service superior in comfort and speed to that of the street car is given at a higher fare by de luxe vehicles of the Pittsburgh Motor Coach Company

Details of the equipment owned by the Pittsburgh Motor Coach Company are given in Table IV on page 516. The latest equipments, which express the change to coaches of a more luxurious type and having smaller seating capacity, are the 19-seat Yellows.

Earnings, Costs and Expansion of Coach System

The increasing popularity of the pioneer routes and the addition of new ones promise a large increase in business for 1927. Comparison for the first half of 1926 with the first half of 1927 shows that traffic has increased from 531,152 revenue riders to 846,972, while the corresponding rise in net income has been from $11,530 to $30,110. Meanwhile the total traffic on the trolley system increased from 202,578,931 in the first half of 1926 to 203,143,147 in 1927. The net coach income remaining after meeting all cost of service charges rose from $285 to $121,970.



Half-hourly service between Newark, N. J., and Hackensack, N. J., is maintained by de luxe buses of the Public Service Transportation Company

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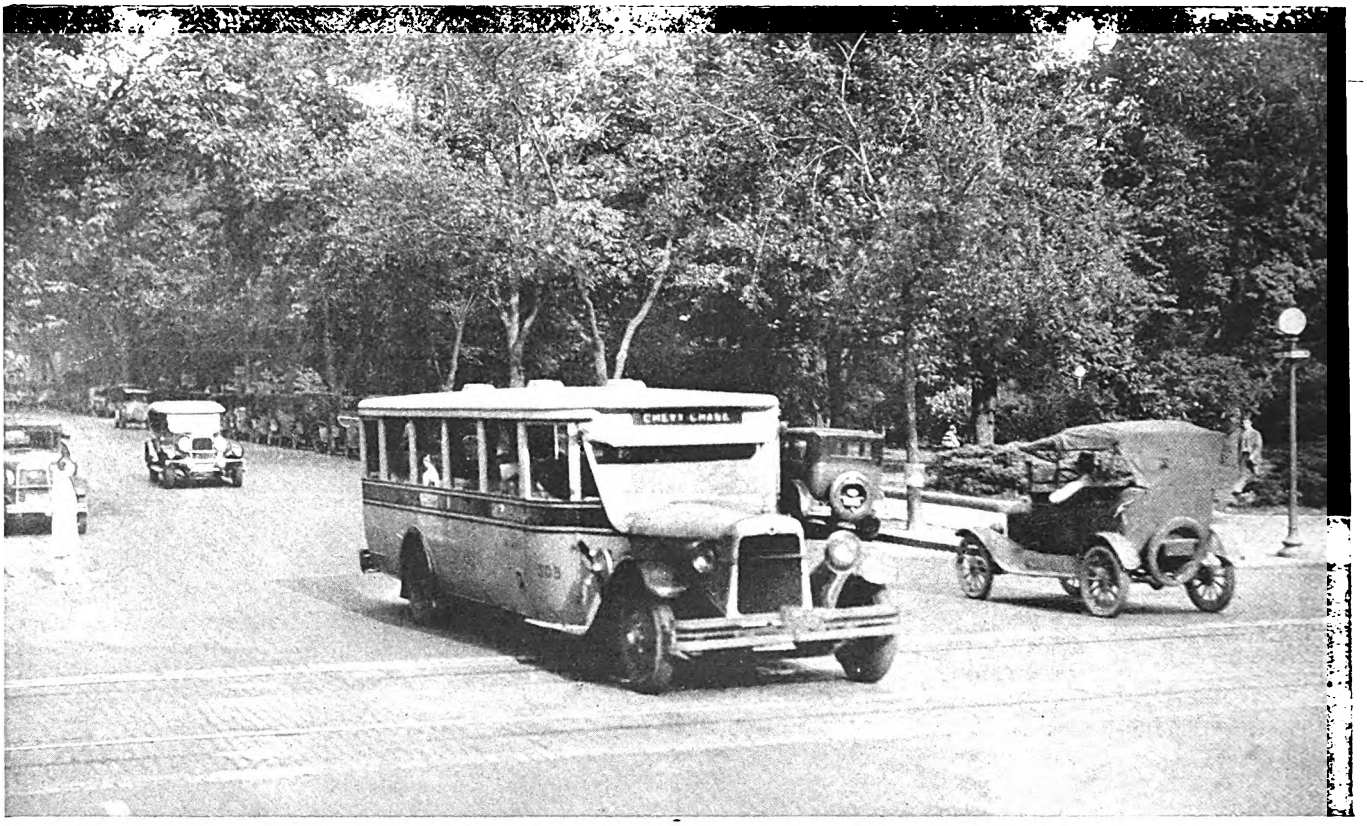

At Washington, D. C., the Capitol Traction Company operates de luxe bus service between the center of the city and Chevy Chase

So far, the Pittsburgh Railways has been spared the burden of carrying extensive unprofitable bus operations which might have led to higher average fares than those quoted. Although the cash street car fare with cross-town transfer privilege is 10 cents, less than 6 per cent of the revenue comes from this class of riders. Both the $8\frac{1}{3}$-cent token and weekly pass fares are very popular. In addition, a straight 5-cent fare obtains for short-haul rides on fourteen routes, on all the Washington city system and on part of the McKeesport routes. One route in McKeesport has a 3-cent ticket.

The only regular low fare bus service in Pittsburgh was an operation between Millvale and Pittsburgh via the 40th Street Bridge, begun on June 14, 1926, and abandoned on June 1, 1927. This was operated jointly by the Pittsburgh Railways and the Pittsburgh Motor Coach Company. It failed to meet expenses by $400 to $450 a month on a fare of 10 cents with transfer privilege to trolley. Outside of this, the only bus operations by the Pittsburgh Railways have been of emergency character. It operated a sixteen-seat bus for shuttle service during the reconstruction of the North Washington route, and a second bus seating 29 was used during the reconstruction of the Beltzhoover line.

Table IV—Summary of Equipment Owned by the Pittsburgh Motor Coach Company

Type	Seats	Manufacture	Number
De luxe parlor	19	Yellow Coach	26
De luxe parlor	29	Safeway	2
De luxe parlor	16	White	1
Street car	29	Safeway	8
Street car	24	Mack	1
Street car	24	Pierce-Arrow	1
Street car	29	Fageol	2
Street car	24	Newport	1
Total			42

Variation in earnings and expenses in different months of the year are shown in Table I. Winter, with 39.44 cents regular passenger revenue, is the best earning time, for then the autoist is less inclined to use his own machine. In June, with less shopping and more personal automobiling, 30.91 cents revenue came from regular passengers, but 2.70 cents came from special service. July, with school closing, vacations and exceptionally rainy weather, produced only 26.77 cents, but the operation was saved from loss through the rapid growth of chartered coach service to beaches and parks. This added 5.03 cents per mile, despite very poor weather. Table II shows the costs in detail for June, 1927. These figures may be regarded as typical.

In developing chartered coach and sightseeing service we employ a solicitor and enjoy the courtesy of paragraphs in the *Transit Guest,* the weekly "take-one" publication of the Pittsburgh Railways. Chartered coaches handled during 1926 totaled 436, while for eight months of 1927 the number run was 676.

These figures summarize briefly the experiences of the Pittsburgh Motor Coach Company. We have found the operation of de luxe buses on short headways at a 25-cent fare to be a paying proposition. The private automobile developed a desire for faster and more luxurious transportation than can possibly be given by a low-fare electric railway or bus service. That desire has become so set with many automobilists that they are willing to subject themselves to heavy expense and much annoyance rather than return to what they deem lower-grade transportation. By giving service of superior quality at a higher fare, however, we have succeeded in attracting this kind of patronage and built up a profitable business.

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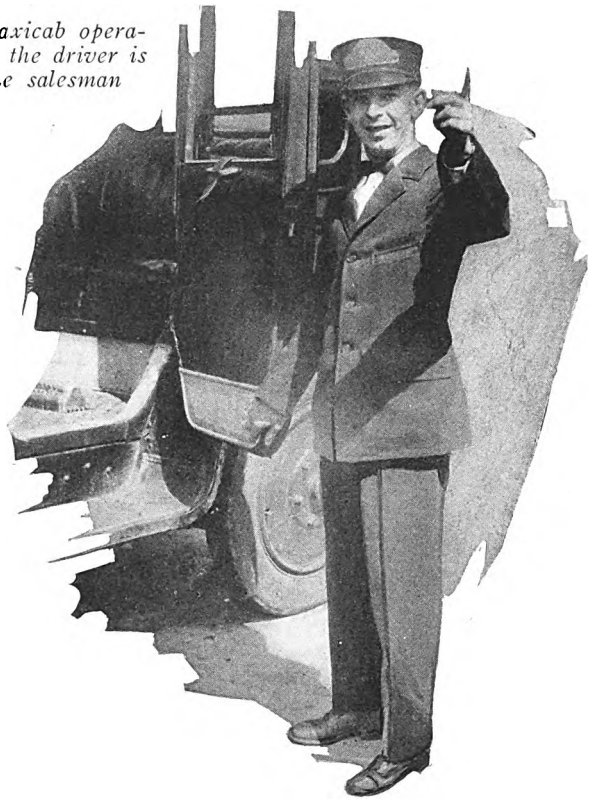

In taxicab operation the driver is the salesman

Taxicabs

a Logical Element in

Complete Transportation Service

By J. A. QUEENEY
Vice-President Mitten Management, Inc.

"CO-ORDINATED TRANSPORTATION" is very much like the Constitution of the United States, so far as the ever-broadening interpretation of its meaning is concerned. Perhaps the first step in the co-ordination of urban transit was the elimination of competition between various street car lines, by joining them together into a single operating body. Next came the joining of rapid transit and surface lines. Then the bus appeared on the scene. Some sneered at it as a transitory fad. More far-sighted transportation men realized its possibilities and welcomed it into the fold. Last but not least the taxicab has been looked upon and found not unlovely.

Each of these steps has been considered by no small number of transportation men as a bold, even daring, maneuver. Each, in due course of time, has come to be accepted as a logical phase in the evolution of local transportation, though not without ranting by the demagogs and the necessity for careful educational work on the part of the transportation companies.

In April, 1926, after the approval of the city of Philadelphia and of the Pennsylvania Public Service Commission had been duly secured, the Yellow Cab Company of Philadelphia was purchased by the Philadelphia Rapid Transit Company for the sum of $3,000,000. At that time this cab company was the largest in Philadelphia and the third largest in the world, having 1,100 cabs available for operation and an experienced personnel of 3,000.

The decision of any established transportation company whether or not to enter the taxicab field must depend upon a vast number of purely local conditions. It may be stated as a general premise that, except in very extraordinary circumstances, this type of operation should be undertaken only when there seems ample evidence that a substantial profit may be earned within a reasonably short period. As a profit-maker, the taxicab may be a very welcome little brother to the street car and bus, since it serves to bolster the earnings of the company and at the same time ceases to provide ruinous competition in the heavy-riding districts.

But some communities are "taxi-riding" and others are not. Generally speaking, the more cosmopolitan the city the more profitable the taxicab field may be expected to be, unless cut-throat competition has already cut the business to pieces. Taxi-riding is essentially a luxury, indulged in by the wealthy and those in moderate circumstances alike, but only where the public has become educated to the use of this individual transportation service. In communities where the street car and the bus still meet the needs of practically all elements of the population the early career of a taxicab enterprise may be full of pitfalls. Hence the railway man who contemplates entering the taxicab field should ask himself whether he or any one else can make a success of the business. The safest plan, albeit the one with the greatest initial cost, is to take over an established organization which has already proved itself a money maker.

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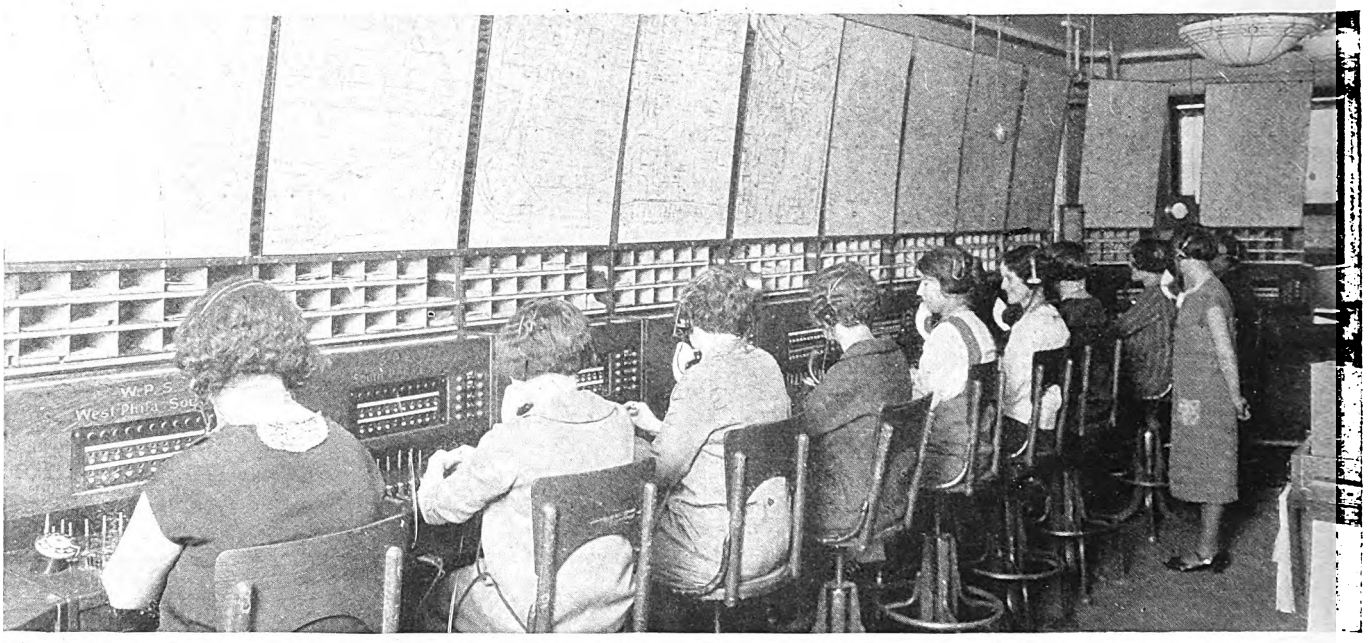
In this way the prime requisite of an experienced and able operating personnel will be provided. The merchandising of taxi rides is like no other merchandising problem. Taxis are not like street cars and buses, operating on definite schedules and relied upon by multitudes of people for regular transportation. A prospective taxi-rider will be a customer only if his vehicle is right at hand or can be furnished instantly. Otherwise he will avail himself of some other means of transportation or will walk. A trained taxicab operator knows all of this and has a thousand little schemes up his sleeve to provide that "Johnny-on-the-spot" service.

When Mitten Management entered the taxicab field that was the procedure followed. The Yellow Cab Company of Philadelphia, incorporated several years before, had increased rapidly in size and had so perfected its service that at the time of the purchase it was acknowledged as being in the van of cab organizations in the United States. During the year 1925 its gross revenue had been $5,000,000 and its net $425,000. Hence the purchase price of $3,000,000 was conceded to be a fair outlay for the property.

In taking over the property Mitten Management announced that no major changes in the operating personnel of the cab organization were contemplated. Such adjustments in practice as have been effected to date have been aimed solely toward more closely co-ordinating the cab service with the other public transportation mediums and taking advantage of such operating economies as might be put into effect.

In the main, it may be said that the public invariably stands to gain by a reduction in the number of more or less competing transportation agencies, with a corresponding centralization of responsibility, provided that the co-ordinated system which results is subject to the proper kind of regulation. The financial resources behind a great transportation system quite naturally inspire public confidence, since there can be no question as to the company's ability to make redress for injuries or fatalities.

Furthermore, the public has learned by experience that it may rely upon a street railway of the proper sort to maintain definite schedules and to keep up a fixed standard of service, regardless of slumps in the transportation business. It would like to find a similar degree of reliability in the operating standards of other transportation media, such as the taxicabs. It most emphatically does expect this standard of service when a taxicab organization is taken over by the larger transportation company. But the advantages do not lie wholly with the public. Quite naturally the building up of public confidence in a given organization leads to public patronage of that particular medium. Undoubtedly the prestige of any cab company would be enhanced by linking up service of this kind with the organization which operates the balance of the community's transportation facilities.



Expeditious handling of telephone calls is an important element in taxicab operation. Telephone exchange of the Yellow Cab Company, Philadelphia

Essentially, a taxicab company is a public utility in exactly the same way that a street car company or a bus organization is a utility. There have been many instances where this basic fact has been lost to sight by state and city regulatory bodies. It is true that a taxicab gives a preferential type of service, closely approximating that of the private automobile, but to the extent that it is available for the use of any member of the public and that it is subject to the same restrictions and many of the same taxes as are other public transportation media it is entitled to certain privileges as a public vehicle.

The established street railway, or co-ordinated system, which through long years has attained recognition as a public utility, already has an organization for fighting the legislative and financial battles which fall to its lot. It is equipped to take the taxicab organization under its wing and, in due course of time, secure for it the same consideration which is increasingly being accorded to the street car and bus. Where the railway has been fortunate in establishing a harmonious working relationship with the municipal government, the position of the cab company, as its subsidiary, would be immensely strengthened.

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Without doubt there is tremendous value in fixing in the public mind the thought of one organization providing every desired type of public transportation. True, it furnishes the local quipsters with a fund of "digs" at the railway management. It provides inspiration for the newspaper cartoonist and columnist. But all this is excellent advertising and serves to root that picture of co-ordination ever more deeply in the public consciousness, provided that the established transportation company upholds its end of the bargain by making a convincing success of each new enterprise which it takes over.

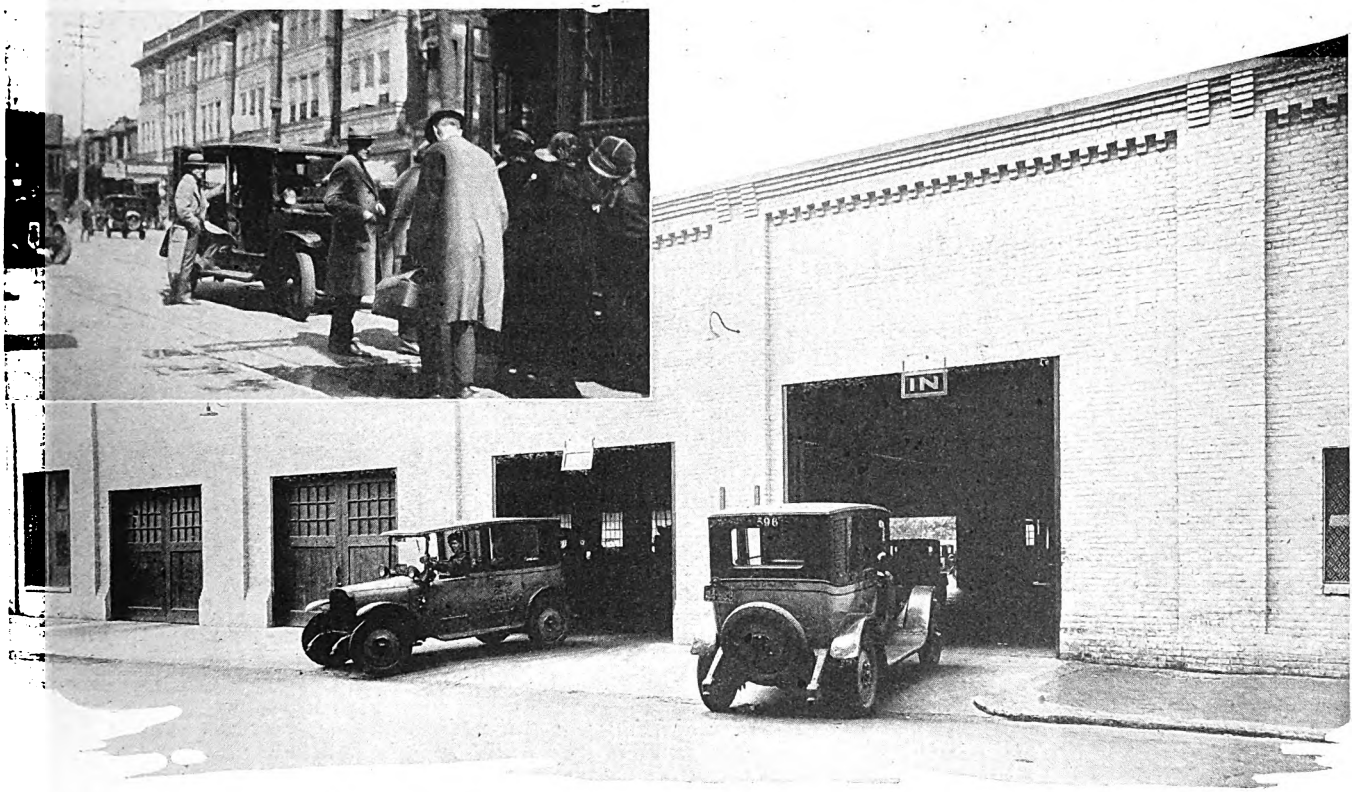
The extent to which a taxicab organization may profit in reduced operating costs by consolidation with a street car and bus operating company depends entirely upon local conditions. If the transportation company's bus operations are not very large and its maintenance facilities are adequate, it is possible that the maintenance of a moderate cab fleet could be added, with minor adjustments in personnel and equipment. However, in the case of a large operation, such as the Yellow Cab Company of Philadelphia, this has not been possible.

Joint use of telephone dispatching facilities presents interesting possibilities, providing that the requirements of the street car, bus and cab operations do not conflict. Where the street car system possesses extra telephone cable privileges these might be taken over by the taxicab department, with a corresponding reduction in costs to both units. Established bureaus of the transportation company, such as engineering, accounting and public relations, may well be expanded to handle similar work for the cab organization, thereby eliminating duplication of effort.

Perhaps the thing most heartily desired by cab companies and municipal governments alike is a panacea for the wasteful and traffic-clogging practice of "cruising" for fares. But this is easier said than done.

It is the uncertain nature of the taxi rider, his readiness to take the first cab in sight or to do without one entirely, unless he can be "snared" at the psychological moment, that renders the situation so difficult. Unquestionably, however, a solution of the problem may best be found by considering cab operation in relation to the other phases of public transportation, so that this may be looked to as a future advantage of co-ordinated operation.

While by far the bulk of the cab business is done by "pick-up" in the central districts, the telephone dispatching service is nevertheless an important element. Telephone calls for cabs will be made just to the extent to which speedy and unfailing response to those calls is given. The Yellow Cab organization in Philadelphia has built up this phase of its business enormously during the past few years. A central telephone dispatching board, with a number of operators, is provided, and from this point calls are relayed to cab drivers at the more than 200 cab stands established in various sections of the city. Hence the "magic carpet" is at the door within a few moments after the telephone request has been made. The cab driver-salesmen have been thoroughly impressed with the point that, once having accepted a telephone assignment, that call must be gone through with, regardless of what "pick-up" jobs may appear on the streets. As a result it is only rarely that patrons complain of failure to respond to their order for cabs.



Inset—Individual service is given by the taxicab while the car handles the mass movements. At right—Equipment used by the Yellow Cab Company of Philadelphia is housed in a garage by itself, separate from other automotive equipment of the P.R.T., its parent company

Results from Cab Operation in Philadelphia

P. R. T. operated the Yellow Cab Company for eight months during 1926. Net earnings for this period amounted to $198,338, being at the rate of approximately

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$300,000 per annum. The gross passenger revenue of the cab organization for the calendar year 1926 was $6,437,969. Last year was a good one for cab operation in Philadelphia, partially due to the presence of the Sesqui-Centennial Exposition in the city. Earnings thus far in the current year have not come up to those for a corresponding period in 1926. During the first six months of 1927 the gross passenger revenue from our cab operation amounted to $2,980,674. Something of a temporary industrial depression has manifested itself locally during the past few months and of course this has had a distinct influence on taxicab riding.

Cabs Operated by Railway in Minneapolis

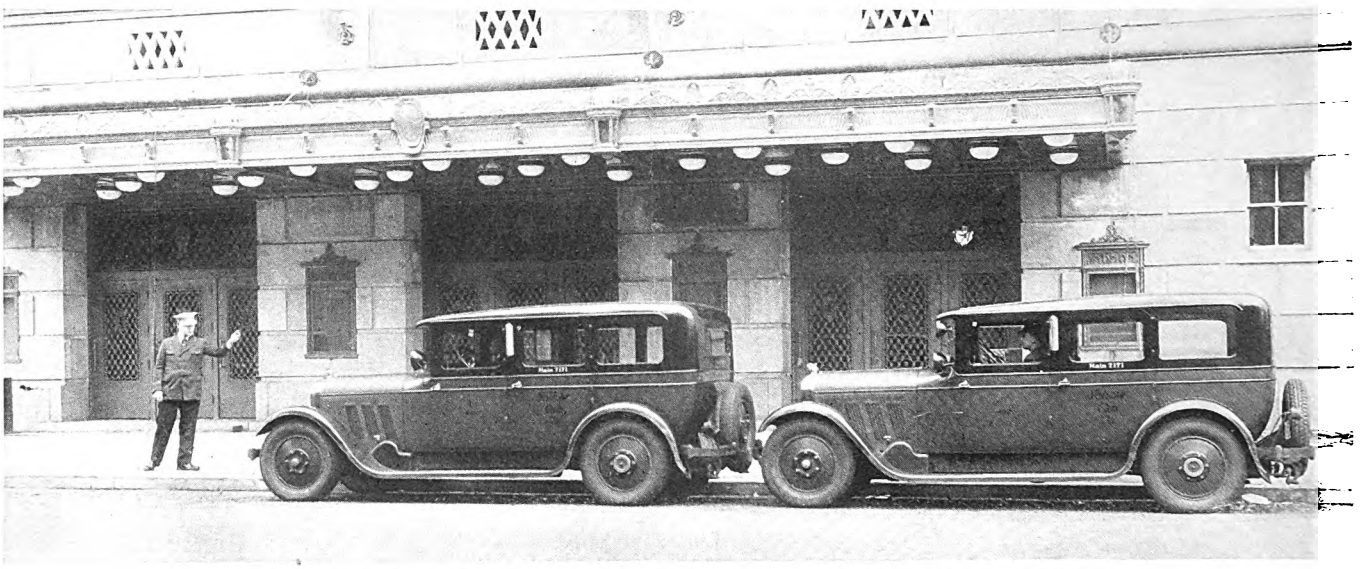
To date only one other established transportation system has undertaken the co-ordination of the taxicabs in the community which it serves. That company is the Twin City Rapid Transit Company, in Minneapolis and St. Paul. Other railway executives are delving into the possibilities of such a step, judging by the requests for information on the Philadelphia operation which are received. The question is frequently asked, "Is the taxicab business so much a cut-throat proposition that it is unsuitable for a responsible agency like an existing transportation company, or is it possible to eliminate cut-throat methods, either through regulation or by rendering service of a character so high that competitors cannot live?"

Answering the second part of the question first, it may be said that the so-called cut-throat methods are frowned upon by reputable independent operators. Where they exist, however, they cannot be eliminated by sheer quality of service, since, as has been pointed out before, a prospective cab patron is more interested in securing a vehicle at the moment desired than he is in waiting for a more comfortable and reliable cab.

Proper regulation of all cab operations in a given community by the police authorities and by the state public service commission will go a long way toward eliminating some of the most objectionable features of cut-throat competition. The established transportation company cannot afford to prejudice the success of its cab venture by entering into a rate war with independent operators unless he is literally forced into it by the direst of tactics on the part of his competitors. Cab rates may easily be lowered, but can be raised only over a storm of protest which may have far-reaching consequences.

Hence it is eminently desirable to establish the taxicab venture upon a sound earning basis at the outset and to maintain it at that point through thick and thin. If reasonable rates are backed up by a reputation for safety and courtesy and for financial responsibility, together with comfortable and well-maintained equipment, it will be a combination hard to beat.

In most cities there have been efforts on the part of hotels, theaters and similar institutions to reserve the street space in front of their respective places of business and to lease that space as taxi stands to the highest bidder. Without question this is a pernicious practice.



Stand of the Yellow Cab Corporation of Minnesota at the Minneapolis Auditorium. This company is controlled by the Twin City Rapid Transit Company

The streets are public property and are no more subject to the control of the abutting property owners than would be the sidewalks in a question as to who should or should not be allowed to walk thereon.

The Yellow Cab Company of Philadelphia has never entered into such arrangements for exclusive privileges on public property. It is our belief that taxi stands should be provided at all points where patrons are apt to congregate and that such stands should be open to all legitimate cab organizations. The reservation of street space for cabs is justified by the public service which they render, but there should be no discrimination. Concessions on private property, near points of concentration, is another matter entirely. They are justified only if sufficient patronage is procurable at those points.

Unquestionably the office building of tomorrow will make provision for cab stands, so that its tenants may be afforded convenient cab service. The railroads have universally recognized the importance of making such provisions, stores in some of the larger cities have adopted the same plan and there is every reason to believe that the modern office structure will be planned along similar lines. Luxuries though cabs may seem to be, they are patronized almost as necessities by an ever-growing number of people.

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Broad Street, Newark, N. J., at Military Park, a heavy traffic po int on the lines of the Public Service Transportation Company, the largest operator of buses in America

Street Car Type Bus

Meets a Real Transportation Need

By JOHN A. MILLER, JR.
Associate Editor ELECTRIC RAILWAY JOURNAL

BROADLY speaking, there are four kinds of service for which the street car type bus is well adapted. First, it may be utilized advantageously to serve districts not already served by rail lines and where the traffic is too thin to justify an extension of the railway. Second, it may be used to supplement car service on heavy traffic lines, either by furnishing local service while the cars run express or by giving express service while the cars do the local business. Third, it may be used to replace rail service where a large expenditure would be required to rehabilitate a light traffic line. Fourth, it may be used to replace rail service where the latter is not conveniently routed, or where operation is hampered by single track or other unfavorable conditions.

In making extensions into newly developed and sparsely settled districts beyond the limits of the railway system, the great advantage of the bus over the car is the smaller original investment required. It is customary in a situation of this kind to operate the bus service merely to feed the nearest rail line and to transfer passengers from one vehicle to the other where their routes meet. This practice is followed by the Boston Elevated Railway, the Winnipeg Electric Company and a number of other electric railways. Sometimes, however, the bus routes serving outlying districts have been extended into the center of the city. From the standpoint of the convenience of the passenger such an arrangement has advantages, but the number of buses required is larger, with a consequently larger capital outlay. Moreover, the cost of operation is increased in proportion to the increase in vehicle mileage and a certain amount of duplication of service is likely to result from this process. If the nearest available car line has sufficient capacity to accommodate the passengers from the bus line, it probably is better to confine the bus operation to purely feeder service rather than to establish it as an independent trunk line.

Serving a district lying between two rail lines is a somewhat different problem. When railway routes spread out fanwise from the center of the city, areas of considerable size may exist in the suburbs at some distance from the nearest car line. These districts may or may not be of recent development. In any event the coming of the automobile has changed the public point of view concerning transportation, and people today are unwilling to walk as far to reach a car line as they formerly did. Hence some kind of convenient service is needed. This may be given either by a crosstown feeder bus route with transfer of passengers to an adjacent rail line, or by through bus service to the downtown district. Sometimes it is

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Buses Operated by Electric Railways Supplement the Car Service in Many Cities

Bus service of the Louisville Railway connects with trains at the Central Station

Below—In Albany, N. Y., bus service is operated by the Capitol District Transportation Company, a subsidiary of the United Traction Company

At left — Co-ordinated rail and bus service of the N. O. P. & L. Company at Akron

Below—City terminus of bus lines operated by the Connecticut Company at New Haven

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possible to combine several crosstown feeder bus services into a route of considerable length. Usually, however, the most satisfactory way to serve a district lying between rail lines is by furnishing through bus service to the center of the city. An example of this is the operation of the Connecticut Company at New Haven.

The rate of fare on a bus route operated as an extension to an electric railway is a matter of paramount importance. In general, new bus routes should pay the cost of their operation. The only alternative would be to absorb the loss in the earnings of the whole system. While it is true that bus extensions cannot be considered entirely independently of the general transportation facilities, and there are numerous instances of lines, both bus and car, that do not earn their cost of operation, the establishment of new lines of this character should be undertaken cautiously. Under ordinary circumstances, it is better to defer the establishment of feeder bus service until the traffic is sufficient to make the undertaking

routes of the Public Service transportation system in New Jersey. The bus, being a smaller unit than the car, makes fewer stops. Moreover, it has greater flexibility in traffic and is somewhat less subject to delays. For these reasons the bus ordinarily is somewhat better suited than the car to render express service.

Whether or not this should be done at street car fares depends on a number of factors. In short haul railroad and in rapid transit operation, no distinction is made between the express passenger and the local passenger as regards the rate of fare. If the bus is simply acting as a supplement to the rail system, giving the same quality of service, the fare should be the same. On the other hand, if better equipment is used for express bus service, the so-called semi-de luxe type, it is reasonable to charge a fare higher than that on the cars.

Street car type bus service sometimes is used to replace electric railway service on light traffic lines. The extent to which such substitution has gone, however, is

At Winnipeg, Manitoba, buses are used in crosstown feeder service connecting with car lines

a financial success. The establishment of any considerable number of losing lines might easily force an increase in the general fare level.

Use of buses to supplement car service on heavy traffic lines has attractive possibilities. This can be done in either of two ways. The cars can be operated express from the center of the city to some point in the suburbs while the buses carry the local traffic. Such an arrangement has been in effect for some years at Providence, R. I., and has worked out well. A similar plan is being tried at Detroit. Attractive savings can often be made by a combination of express car and local bus operation. It is difficult, however, to operate satisfactory express service with cars, unless the street is sufficiently wide so that they are comparatively free from vehicular interference. Such freedom from interference may be secured by operating the cars on a private right-of-way in the center of the street, as is done to some extent in Boston, Baltimore, and a number of Southern cities.

A plan which has been more widely adopted is to have the cars do the local business and have the buses give express service. This is being done on a number of

much exaggerated in the public mind. Because this has been done successfully in a limited number of instances, the layman is apt to have the idea that the bus is going to replace the car on all light traffic routes and perhaps on the heavily traveled routes also. As a matter of fact, comparatively little railway trackage has been abandoned in favor of buses. The electric railway industry as a whole in the United States and Canada has replaced rail service by bus service on only about 5 per cent of its trackage. This represents but an insignificant part of the present bus operation of the railways.

Substitution of bus service in place of rail service usually is made because of the existence of conditions unfavorable to continued railway operation. It may be that the track has been allowed to deteriorate until extensive rehabilitation is necessary, or it may be that a big paving program is in prospect, either of which would cost the company large sums that it could ill afford to spend on a light traffic line. To avoid such expenditures the management may decide to substitute buses in place of cars. In many instances this plan has worked well.

When this is done there arises a serious financial prob-

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lem. Under ordinary circumstances the railway is not likely to have accumulated sufficient depreciation and renewal reserve against any given piece of track, to permit writing it off the books when it is desired to substitute bus service in place of car service. For this the management cannot be blamed because the accumulation of reserve for depreciation and renewal is regulated by the state utility commissions. If the track to be abandoned is only a small part of a large system it can be written off from the general reserve fund, but if, as sometimes occurs, this track represents a fairly large part of a small system, this procedure is impossible, and the management is then faced with the problem of paying interest on the original investment out of the bus earnings. Since substitutions of this kind almost always are on light traffic lines this is a difficult matter. The ultimate solution appears to lie in a more liberal attitude on the part of regulatory bodies to permit earning and setting aside larger amounts for depreciation and renewals.

It frequently happens, also, that buses are substituted in place of cars when it is desired to make a change in routing, or when the cars are operated over single track with badly located turnouts. A number of substitutions of this kind have been made with marked success on railway systems. When the tracks were originally laid it was not possible to secure permission to follow the desired route all the way, and rather than delay the construction of the line a roundabout route was adopted. While this did well enough in the early days, it is no longer satisfactory because of the increased emphasis which the public places on speed in transportation. In other instances, the character of the neighborhood has changed somewhat since the original electric railway tracks were laid, and it is now found more advantageous to follow an adjacent street. Substitution of buses in place of cars permits this to be done with a minimum of difficulty and expense.

On single-track lines the spacing of turnouts determines the headway that can be operated. Often it is found desirable to change the headways from those used when the line was first built. This cannot be done unless the spacing of the turnouts is suitable for the desired headway. For example, to operate a six-minute headway with turnouts laid out for a $7\frac{1}{2}$-minute headway, probably would cause intolerable delays. Under these circumstances the solution of the problem may be found in the substitution of bus service in place of railway service.

A complication often encountered in fitting the bus into its proper place in the general transportation scheme arises from the purchase by the railway of existing bus routes operated by independents. This has been done extensively by Public Service in New Jersey, where many routes were laid out with no attempt to prevent duplication of facilities. In fact, the principal idea of the original bus operators was to divert to themselves part of the traffic from some route already in existence, rather than develop new traffic. No real need exists for such duplication of service. Nevertheless, a certain part of the public finds it convenient, and has consistently opposed any change in routing. It is evident, however, that a substantial improvement could be made by shifting the buses to streets on which no cars are operated. This was done with marked success on one route early this year. The result was a substantial increase in the combined traffic on cars and buses serving the territory, showing conclusively that the convenience of the public as a whole was greatly enhanced thereby.

Used in its proper place, the street car type bus is a valuable adjunct to the electric railway. Its greatest usefulness, however, is not in merely duplicating rail service, nor in general is to be found in supplanting it, but rather in supplementing it on heavy traffic routes and in districts not otherwise satisfactorily served.

Handling traffic by bus over the Delaware River Bridge connecting Camden and Philadelphia

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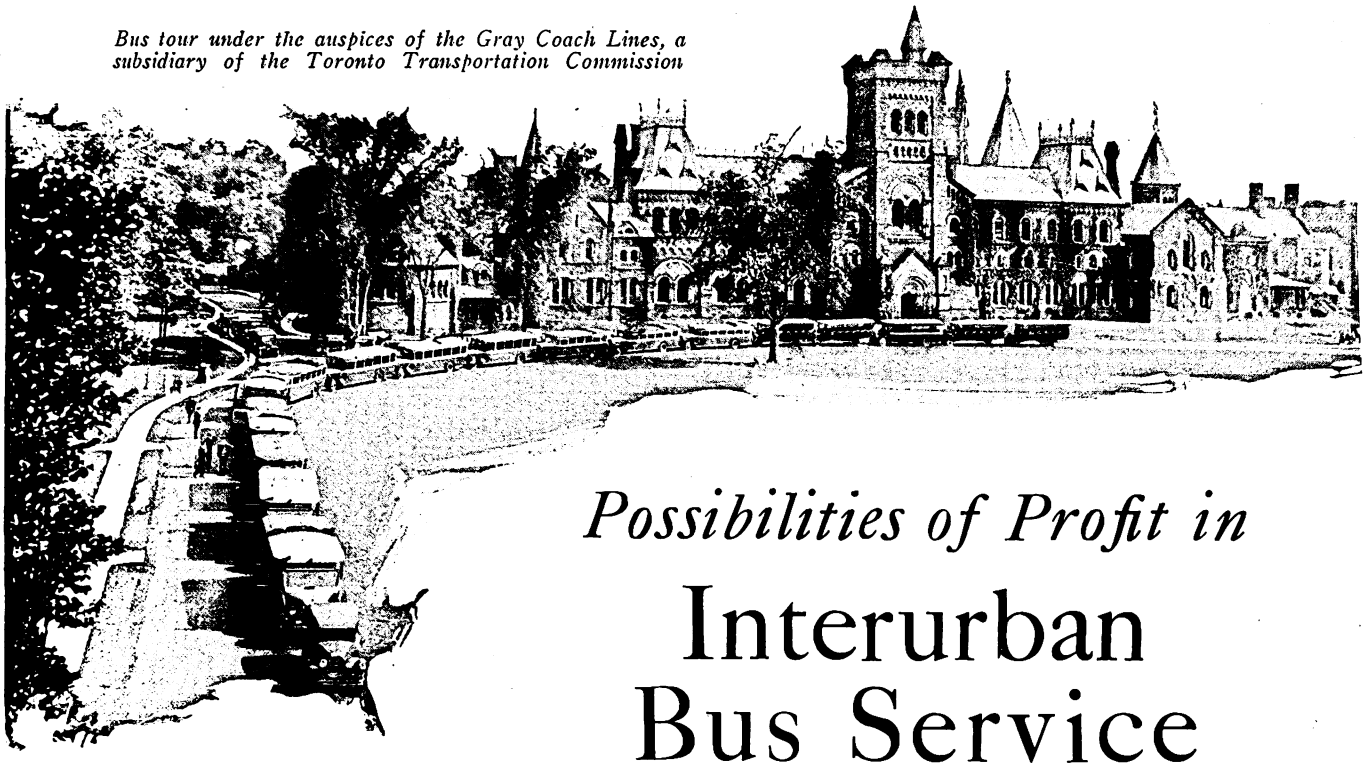

Bus tour under the auspices of the Gray Coach Lines, a subsidiary of the Toronto Transportation Commission

Possibilities of Profit in Interurban Bus Service

By J. L. SMITH

General Superintendent Gray Coach Lines and Superintendent Motor Coach Department Toronto Transportation Commission

ONLY in recent years has interurban bus operation been developed on a large scale, but a discerning public has made its voice heard and long distances may now be traveled by means of the modern parlor coach. In a number of instances this service is given by electric railway companies or their subsidiaries. In Canada, as yet, bus transportation is in its infancy and, with the exception of a few companies, operation is confined to city routes or short suburban feeders to the main city system. One of the principal difficulties encountered in the Northern states and Canada, with which the Southern states do not have to cope, is the severe winter weather and the accompanying problems of keeping the services operating. The solution of these problems should receive the most careful consideration of any company that proposes to inaugurate an interurban coach line because, once started, no route should be abandoned for a single day. Besides the loss in revenue that occurs if operation is suspended there is the more severe loss of prestige, which may prove disastrous to the whole undertaking. It is a matter of satisfaction to the management of the Toronto Transportation Commission that last winter not one single trip was lost between Toronto and Niagara Falls, a distance of 90 miles, the longest interurban route now operated by the Gray Coach Lines, Ltd., its bus subsidiary.

In 1921 four solid-tired city-type buses were all the automotive passenger vehicles owned by this company. Three years ago this had grown to a fleet of twenty. Now, in 1927, more than 120 modern buses are operated some 90,000 miles per week, or nearly 3½ times around the world. Four schedule trips each way per day are operated between Toronto and Niagara Falls, with a return trip mileage of 166 miles. Twenty-five trips per day each way are operated on what is known as the Lake Shore Highway between Toronto and Hamilton, a 43-mile run. These, together with three round trips per day between Toronto and Brantford, a distance of 70 miles, and three between Toronto and Cookstown, a distance of 55 miles, account for a considerable amount of this large mileage. Each week shows a steady increase over the preceding one.

No opportunity is neglected to increase business in every possible way. Arrangements have been made with the International Railway to make direct connection at Niagara Falls with Buffalo. Connections are made also at Niagara Falls with coaches operated by the Buffalo, Niagara & Toronto Tours. Coaches of the latter, in turn, make connection with coaches operated by the Buffalo & Erie Coach Company, the Cleveland & Conneaut Bus Company, and the Western New York Motor Coach Lines. Under this arrangement it is possible to make connection between Toronto, Buffalo, N. Y.; Erie, Pa., and Cleveland.

In addition to these services a Circle Tour has been arranged with the Canadian National Railways. This tour permits a passenger to travel one way by coach and one way by boat to Niagara Falls. Through tickets covering these services are sold at all Gray Lines offices. Time-tables are distributed at all offices, outlining the services with the direct connections that it is possible to make. Although started only a short time ago, considerable business has been worked up and it is felt that with additional advertising and the co-operation of agents of the Gray Lines, as well as those of connecting companies, it will be possible to establish a substantial traffic.

Interurban bus operators new in the enterprise may wonder what the prospects are for the future. With the rapid developments which are taking place this is somewhat difficult to forecast. It should be safe to say, how-

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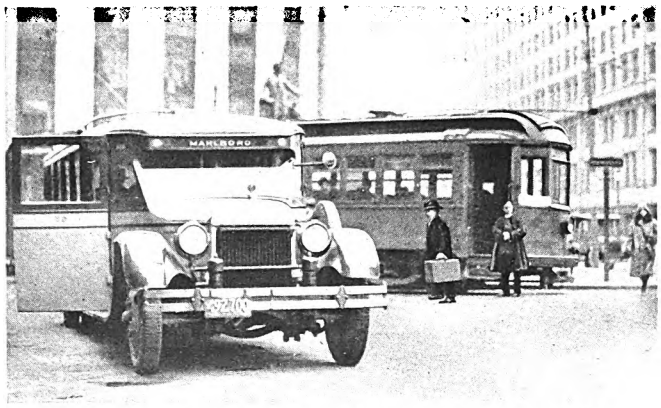


Interurban buses supplement the rail service of the Boston-Worcester Street Railway

ever, that this form of travel is only in its infancy, and its development will depend, to a large degree, on the quality of service given.

The question of road equipment is one of paramount importance. Seats must be as comfortable as possible and have fairly high backs. The air cushion type has proved eminently satisfactory, but if made up in two pieces the upper piece should be held in such a manner that it will not slip forward when the passenger reclines or stretches out. Windows must be so constructed as to provide easy movement. Anti-rattlers are necessary on all interurban equipment. Most companies find that smoking must be permitted on long trips, and proper receptacles must be provided for ashes and matches. Rules regarding smoking must be enforced by the drivers: firmly, but in a tactful way.

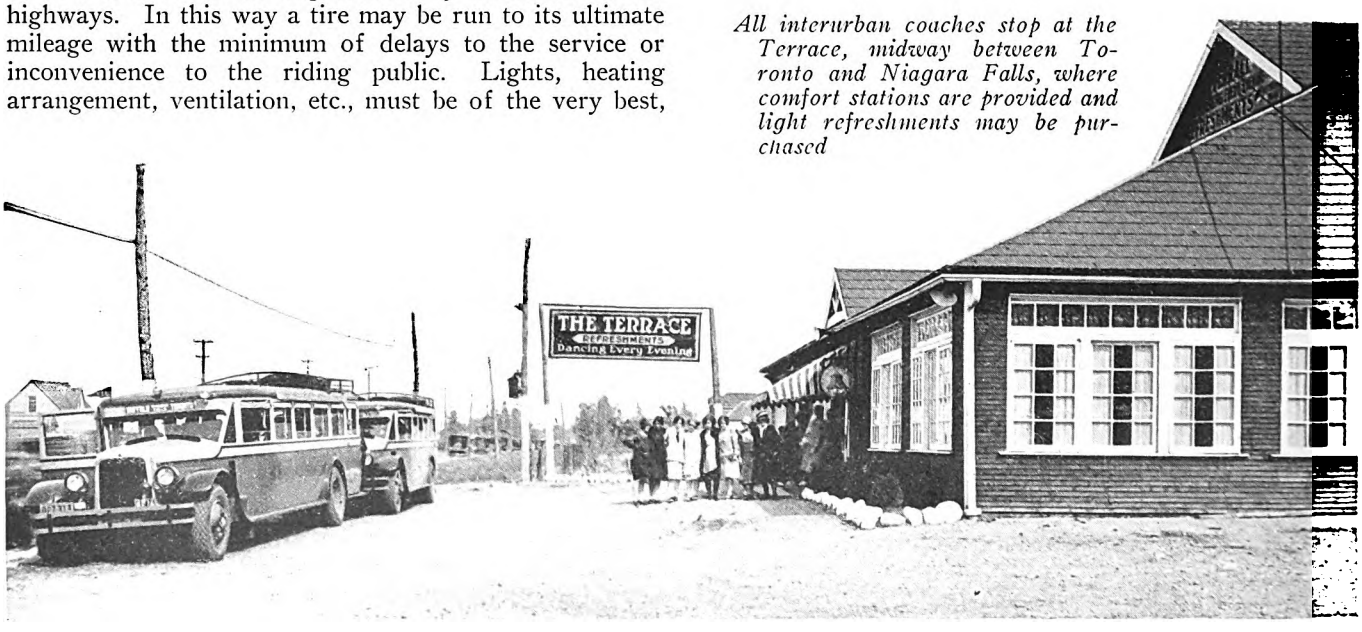
As interurban passengers will be likely to have baggage to carry, this problem must be given full consideration if the system is to run smoothly. The luggage rack on the roof should have a waterproof tarpaulin covering, and straps should be supplied to hold the bags securely in place. A system of checking should be in force. Tires are an important item in operation, and the plan of carrying two spares on every coach has proved very successful. When signs of wear are noticed tires are removed and placed on city lines, where a much shorter headway between coaches and nearness to the garage eliminate the trouble that would be experienced by blowouts on the highways. In this way a tire may be run to its ultimate mileage with the minimum of delays to the service or inconvenience to the riding public. Lights, heating arrangement, ventilation, etc., must be of the very best, and it is hardly necessary to add that the mechanical condition of the coach must be as nearly perfect as the garage forces can make it.

For the convenience of those along the route wishing to board after dark, all coaches of the Gray Lines are equipped with large green lights attached to the roof. The light can be seen at a considerable distance, and by reason of its height it is visible over the top of other traffic. An emblem recently has been designed and placed on all Gray Line coaches. This has a green disk, representing the green light on the coaches. in the center of a pair of wings above a shield. Illuminated signs of the insignia, with the green disk also illuminated, are being constructed and will be placed at all important terminals. Metal signs of the design are being placed at other stopping points, and arrangements are now being made to place signs at all stops on the various highways over which this company operates. Drivers are instructed to request passengers to "look for the green light." Aside from the advertising value, this arrangement has been of considerable convenience to the traveling public.

Perhaps no item on a long-distance run is more important than the selection of drivers. Besides being directly responsible for the safety of the passengers, they are the greatest selling force. A clean-cut, courteous and cheerful operator will bring more patrons to the coaches than hundreds of dollars worth of advertising. Obviously, drivers should be selected with the greatest care and, if possible, only men of large stature taken. They should be trained thoroughly on the route over which they are to run and impressed by every means with the necessity of not only looking for passengers at the various stopping points but of expecting them. When thoroughly conversant with the road, the agencies, and the various municipal laws affecting the operation along the route, then, and not till then, should they be given charge of coaches.

It costs a considerable sum to thus train a driver and it therefore follows that he should be kept on the chosen route as long as possible. Much is expected of the operating men and, in return, in order to keep the morale at the highest point, every facility must be given them to make their task as easy and as pleasant as possible. The following instance is cited as an example of what the

All interurban coaches stop at the Terrace, midway between Toronto and Niagara Falls, where comfort stations are provided and light refreshments may be purchased



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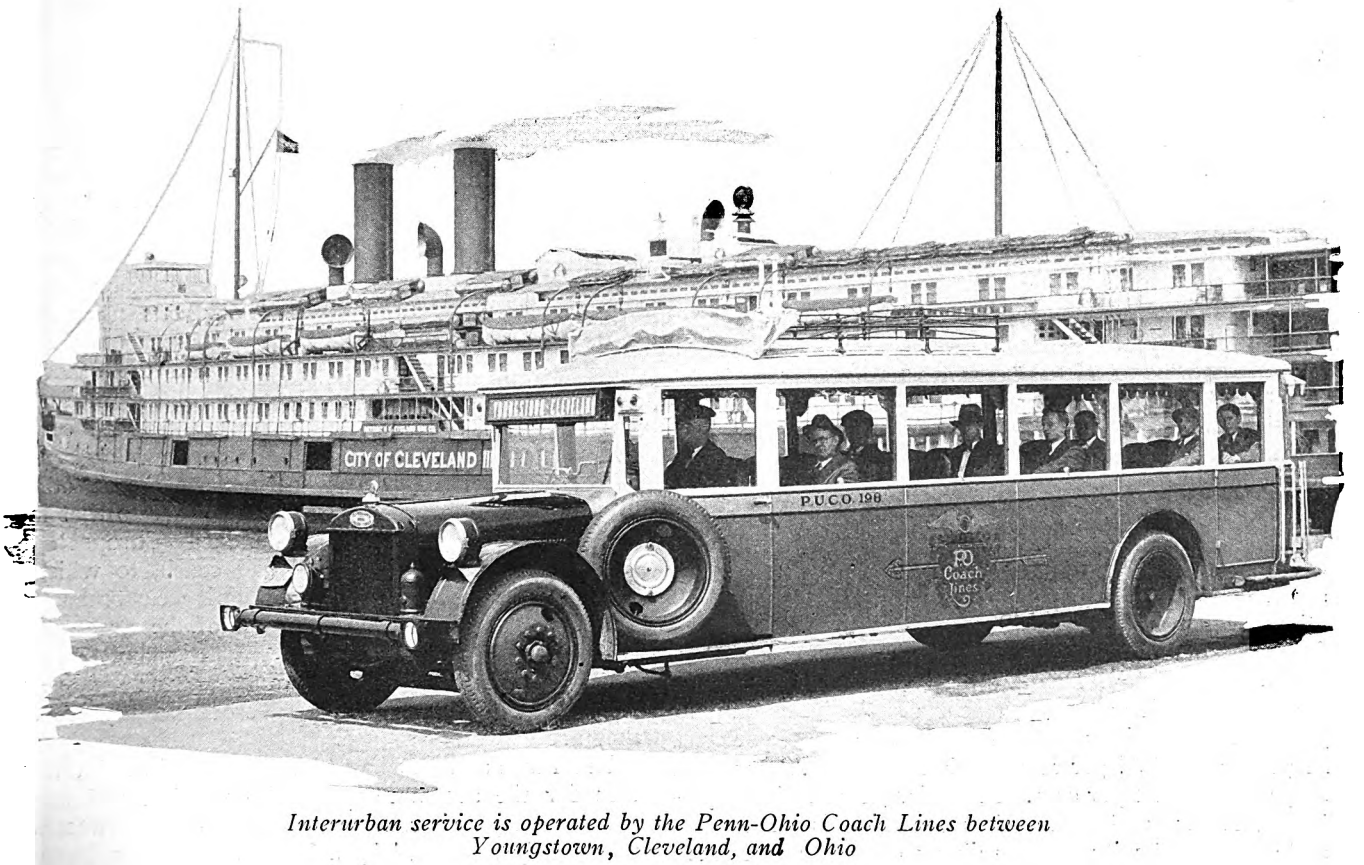
Gray Coach Lines do in this respect. During the two weeks period of the Canadian National Exhibition a special service, in addition to the regular service, is operated on all interurban routes. In one city alone, Hamilton, Ont., twenty extra drivers are required to handle the special service out of that city. A large office has been fitted up with beds to form the dormitory for these men. Wash rooms and shower baths have been engaged in the city's leading hotel, and every chance given the drivers to report for work in the morning as if they were coming from their own homes.

The local agent is a highly important advertising force. The company with which the writer is associated has gone to considerable length to establish in each municipality of any size whatever a competent and willing agent. Often he is the owner of the general store



Interurban service is operated by the Penn-Ohio Coach Lines between Youngstown, Cleveland, and Ohio

or, perhaps, the druggist; in any event, he is some one who knows the people and is in constant touch with them. After all, a little personal contact is worth a great deal of spasmodic advertising, and it is the experience of this company that the appointment of such an agent always increases the sales and the coach riding habit in that locality. A little authority granted to them will also help things, and some agents of this company who are not on the payroll are allowed to put occasional advertisements in their own local press and to check the service to a certain degree. This results in their taking an active interest in the operation. The relationship with agents should be kept friendly, and frequent visits from one of the officials and the discussion with them will do a great deal to help along this feeling.

In interurban coach operation as stopping points are reached the name of the place should be announced distinctly, as it must be borne in mind that many of the passengers are probably newcomers to the district and will not know their destination by sight. Ladies should be assisted in alighting from the coach and their baggage taken from the racks and handed to them. If tickets are used, they should be collected in a courteous manner and any information regarding the return trip accurately given. If a connection is being made with another coach line, full particulars of their operation should be known to the driver and their schedules outlined to the passenger.

When it is remembered that interurban coaches probably operate on a long headway, it is easily seen that a comfortable and convenient waiting room must be supplied at the terminals and, if possible, at important stations along the routes. The Toronto terminal of the Gray Coach Lines is provided with ticket counter, the tables, easy chairs and decorations, such as plants, etc., that make the place inviting to the traveler and a silent salesman for the company. Telephones, information booths, and proper toilet facilities for men and women are necessary. In building a bus terminal it should be borne in mind also that the architect may, in the exterior design, build a permanent advertisement of untold value.

Along the routes comfort stations must be provided where the coach will stop for a few minutes. Such a station on the Toronto-Niagara Highway is shown in an accompanying illustration. Here the passenger has access to wash rooms, and light refreshments may be obtained.

Actual operation along the route will be influenced greatly by local conditions and topography, but the first and last thought must be safety. To a large degree this can be secured by the driving personnel, to which reference has previously been made. The coach itself, however, must be in the very best possible condition.

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Meeting the Demands for
Better Transportation in Europe

By H. W. BLAKE
Senior Editor ELECTRIC RAILWAY JOURNAL

MANAGERS of electric railway, bus and rapid transit lines in Europe are keenly alive to the need of meeting the demand for good transportation in their several communities. Local transportation has been given in many European capitals for a longer time than here, but the development has been along somewhat different lines. Some of the methods employed appear to give better results than those followed in America. Others, while perhaps suited to European conditions, would not be adaptable here.

Roughly, it may be said that the fields of street car, bus and rapid transit service are the same as in America, though the situation varies widely in the different cities. Thus, in London, where street cars are not permitted to enter the principal office and retail business district north of the Thames, there has been great bus development. In Berlin, on the other hand, of the three facilities the street railways in 1926 carried about 75 per cent of the passengers, the rapid transit lines 15 per cent and the buses only 10 per cent. In Paris the proportions are about 45 per cent, 21 per cent and 34 per cent and in Hamburg 72 per cent, 27 per cent and 1 per cent. In the larger cities in Italy—Rome, Naples and Milan—bus operation is on a small scale compared with street railway operation and there are no real subways, although in Naples an extension of the government main line railroads passes under the city and does a little local business. Generally speaking, in all of these cities the street railways handle the bulk of the traffic. Where the bus and street railway lines are under the same management, the railway is considered more economical than the bus for mass transportation. Where there is a difference in fare, that on the bus is higher.

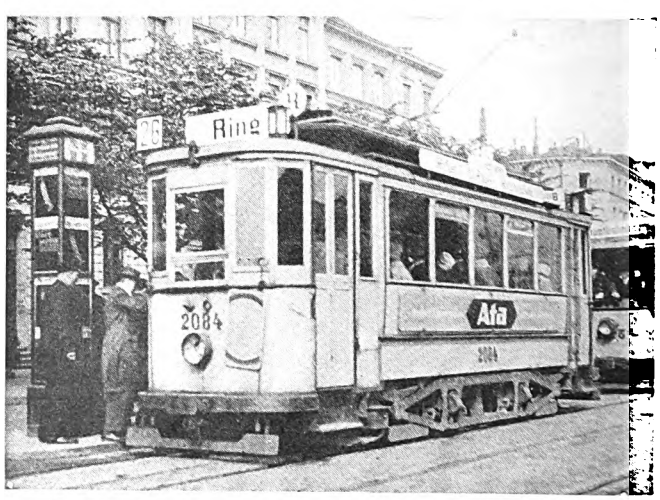
Many surface car trains are run in Berlin. Commercial advertising is often painted on the sides of the cars

FEW CHANGES IN STREET CAR DESIGN

Street railway car body design in Europe has not gone through as many changes during the past twenty years as it has in America. One reason for this may be that most of the bodies in Europe are made in the country in which they are used, and each country has only a limited demand. Compared with the United States, the number of new cars built each year is much smaller. Then, too, a great deal of attention is paid in Europe to good body maintenance, especially painting. There is a corresponding tendency not to scrap cars until they are so injured in an accident as to be practically useless.

On the Continent of Europe the single-deck car is almost the only one seen. On account of the narrow streets and sharp curves, vehicles for city service have to be kept narrow, and are rarely more than 7 ft. wide over all, and often less. As cross-seats are generally used, this means that when two passengers are seated on one side of the aisle there is room for only one passenger on the other side. Reversible seats are occasionally seen, but the stationary seats in which half of the passengers face forward and the other half backward are more common. These seats are usually arranged in groups of two, facing each other, a plan similar to that in the standard European railroad coach, to which the public is accustomed. While some of the street railway seats are upholstered, slat seats are common, especially in southern France and Italy. Open cross-bench cars are occasionally seen, but they are going out of use.

In France and Belgium, the division of the interior of cars for the accommodation of both first and second-class passengers is common. The two compartments are not usually separated by a bulkhead or door, but often



Cars in Hamburg are well supplied with route signs

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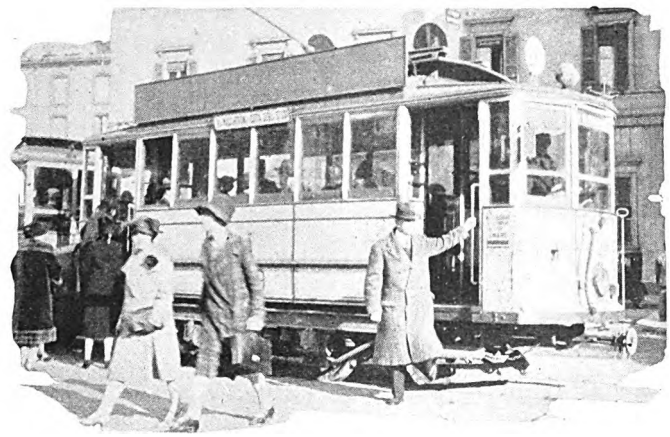
by a bulkhead only, or simply a stanchion on each side of the aisle to indicate the dividing line. The principal difference between the two compartments is that the seats in the first-class compartments usually are upholstered in plush and those in the second-class compartments are either not upholstered or covered in rattan or tapestry of a color different from that in the first class. Where center-entrance cars are used, one end is for first-class and the other for second-class passengers.

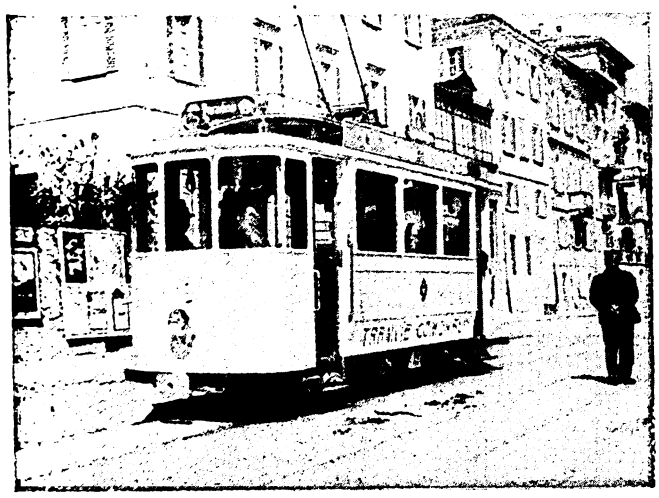
Most of the cars are double ended with end entrance and exit, though lately there is a tendency, as exemplified by the latest cars in Paris and Berlin, toward center entrances. With end entrances some companies make an effort to require passengers to board at the rear, though as hand collection of fares by the conductor passing through the car is common, the method of entrance is not important. On some lines the front platform is reserved for smokers. Where two classes of fares are collected, passengers standing on the platform pay only second-class fare, hence there is a tendency for both platforms to be crowded, even when there are empty seats in the first-class compartment inside. This means that extra support for the ends is necessary.

The principle of the closed platform for safety's sake is almost unknown on the surface and bus lines of Europe, and on most of the rapid transit lines the door arrangement seems much cruder than that used in this country. When a surface car or bus approaches a stopping point, passengers expecting to leave there prepare to disembark and often do so before the car has come to rest. The same is true of passengers boarding cars and buses after they have left the stopping point. While there are sometimes notices in the cars that passengers are not allowed to board or leave the car or bus while it is in motion, it seems to be customary that these notices are disregarded.

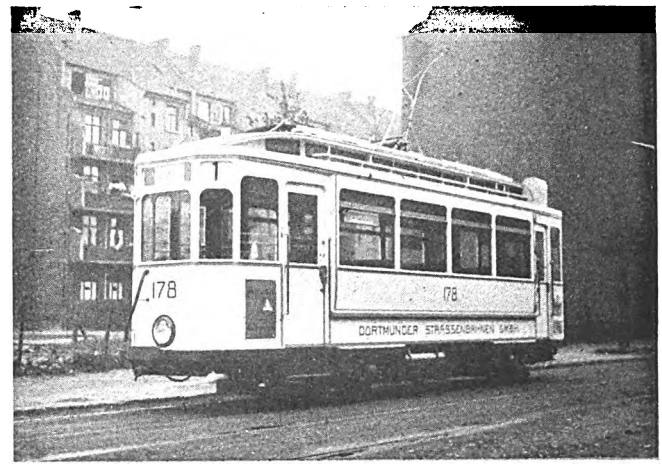


Milan is encouraging the use of the rear platform for entrance and the front platform for exit. This shows the front car of a two-car train

Most surface cars in Europe have platform doors or gates which are kept closed on the side away from the curb but they are kept open on the loading side to facilitate the rapid entrance and exit of passengers. Sometimes, as in Paris, the door opening on the curb side of the car is protected by a slight barrier, such as a chain, to prevent passengers from being thrown from the car while it is in motion, but it is attached to the side posts only by snap links and can be taken off by a passenger as the car approaches a stop. The only surface cars which the writer remembers seeing in Europe equipped with platform doors or gates operated by the motorman were some one-man cars in Amsterdam, a few trial cars recently received by the Berlin Surface Lines, and one double-deck car now on trial service on the lines of the London County Council Tramways.



This car in Lugano, Switzerland, is painted a baby blue



The latest type of Dortmund city car has Cardan drive

Double-Deck Cars Popular in England

Double-deck cars are very popular in Great Britain, but are not used to any extent on the Continent. The only single-deck cars operated in London are on lines where there are overhead obstructions which prevent the use of double deckers. Modern British practice favors the closed double deck.

Cars of the London County Council are built 7 ft. 2 in. wide on the upper deck but only 6 ft. 10 in. on the lower deck, the difference being to allow space for a man to stand between tracks when cars are passing each other. The upper decks on these cars can accommodate, therefore, four passengers on transverse seats, but there is not room for that number on the lower deck. In consequence, the lower decks on most of the L.C.C. cars in the past have been equipped with longitudinal seats, but realizing that cross seats are more popular, the management has been changing to cross seats. This meant not only a loss of five seats on the lower deck but a reduction in the carrying capacity of the car by more than five, because standees are permitted on the lower deck only up to one-third of the number of seats on that deck, and

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Double-deck cars are the standard in London

none are allowed on the platforms or upper deck. The County Council changed 100 of its cars last year to this new arrangement, and expects to change 250 more during 1927. It is fitting all of the seats of the lower deck with cushions and taking the opportunity while these cars are going through the shops to provide better inside and outside lighting and other improvements. All cars so changed over on the London County Council lines are being painted red instead of chocolate for the side panels and dash to help the prospective passenger to distinguish them.

Single Trucks General on the Continent

Outside of Great Britain, single-truck surface cars predominate in city service. In a few of the larger cities, like Paris and Berlin, there are some double-truck cars, but for the most part they are old equipment and no more are being ordered. Where double trucks are used the maximum traction type usually is employed.

One reason for the extensive use of single trucks is that the narrow streets require the use of short cars. Where more capacity per unit is required, two-car trains are used, usually a motor car and a trailer. To prevent the grinding of the wheels on short radius curves, a good deal of attention has been given to radial trucks, but their use does not seem to be increasing.

On the London double-deck cars, maximum traction trucks are the rule, though in Great Britain outside of England there are still a good many single-truck cars. Even in London, four-wheel cars are used on the London County Council Tramways on routes where the grades are steep. For such service, however, the L.C.C. is now designing an eight-wheel, four-motor car to have carrying capacity equal to its maximum traction cars. This new car will use 26-in. wheels.

Loading a Milan bus at Cathedral Square

Efforts are being made in a few cities to test the Cardan drive. Paris leads with 475 cars equipped with this form of drive. Berlin comes next with 20 or 30. There are perhaps 40 more cars in Europe with this form of drive, most of these latter being of what is known as the Albrecht pattern, named from the designer, Mr. Albrecht, general manager of the Dortmund Street Railway. The manufacturer for the Albrecht drive is the Krupp Company of Essen. While the users of these equipments speak well of them, they should still be considered as in the experimental stage.

Roller and ball bearings for both motor armatures and car journals are used more extensively in Europe than in this country. The Berlin surface lines have used roller bearings on all new equipment for three years and during this time have added more than 1,000 cars to their rolling stock. Many other companies are making them standard equipment on all new cars, and the users of the Cardan drive system say generally that roller bearings are essential in its operation.

Careful Attention Paid to Painting

A feature of all European cars, but especially those on the Continent, is the outside finish. On the surface cars light colors predominate, and white is not unusual. Another popular color is a baby blue. These colors are used not only because of the pleasing effect which they produce but also because the cars can thereby be seen a long distance away. This is both a safety measure and of help to waiting passengers. Varnish is used lavishly, so that the exteriors of the cars in many cities really have the so-called "piano finish." Subway cars in Europe do not run to the same light colors, but their exterior finish is well maintained. Instead of paint, Paris is using a vitreous enamel on the side panels of its cars. Hamburg has two cars finished in this way.

Advertising on cars, both on surface cars and on rapid transit cars, is carried far beyond that which is considered good taste and even effective in America. It is often placed on the windows in the form of etching or small transparencies, on the backs of seats, on the step risers, on the hand straps, on the outside car panels, on the trolley poles and even on the trucks.

Wood Predominates in Surface-Car Body Construction

Outside of a few of the latest cars in Great Britain and Germany, most of the street railway rolling stock in western Europe is of wood, occasionally with steel girders for side sills. Aluminum, however, is used extensively for such parts as dashes and side panels to reduce car weight. The reason given for the general use of wood is that the number of cars ordered by any one railway at one time usually is so small that templates necessary for the construction of steel cars would be too expensive. Nevertheless, efforts are being made to keep down the weight, although with only three seats across the car, the weight per seated passenger is not particularly low. Thus in the latest "light" car of the Paris surface lines, which is 37 ft. 1 in. over all, the weight of the car empty is 28,160 lb. As this car seats 30 passengers the weight per passenger seat is 939 lb.

Berlin's latest cars are of steel, and there are a number of steel interurban cars in Germany and some in other countries. While investigation has been made of

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the possibility of using light metals in both car and bus construction, more has been accomplished along this line in rapid transit car body design. The Berlin rapid transit lines are building two cars of light metal and expect a saving of from 6 to 7 tons per car. At present the standard Berlin rapid transit trailer weighs 24 tons and the motor car 32 tons.

Although no special study has been made of means for reducing noise on surface cars in Europe, they are noticeably more quiet than the average car in the United States. The reasons for this and an account of the extended noise reduction experiments of the London Underground Electric Railways Company, with comments on other features of rapid transit car design, will be given in a later article.

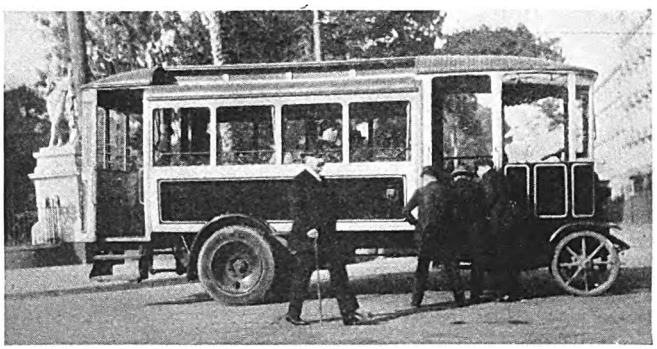
Bus Body Construction and Design

The statement in regard to the use of wood and steel in surface car bodies, made above, applies generally to bus bodies also. The largest user of steel bus bodies is Hamburg, the last twenty bodies added to the equipment there being of steel. Practically all of the bus bodies in Berlin, Paris and London are of wood.

Nearly all the Berlin and London buses are double deck. Of the 4,000 buses owned by the London General Omnibus Company only 180 are single deck and these are on routes where overhead obstructions prevent the employment of double deckers, and a few that run on suburban routes. The Berlin bus company also has a few single-deck buses for special service, but its standard city bus is double deck. Both in London and Berlin the upper deck is inclosed in the latest type of buses. In Hamburg and Paris only single-deck buses are used.

Paris is the only one of the cities mentioned which has two classes of bus fares, first and second. All buses in city service in Paris reserve the front end of the bus, usually sixteen seats on a 38-passenger bus, for first-class fares. For the 22 passengers who ride second-class there is room for twelve seated and ten standing passengers.

Cross-seats are the rule in all of the cities mentioned. In Berlin the upper deck arrangement is unusual, with a side aisle and benches holding three to four passengers each. This plan was adopted to allow a higher entrance to the lower deck, which has a center aisle. It has permitted also a reduction of the over-all height of the bus from 13 ft. 1½ in. to 12 ft. 10½ in., in a later low-floor design. The carrying capacity of the Berlin double-deck bus is 54, allowing three to a seat for the seven seats on the upper deck and 24 seated and nine standing on the lower deck. The over-all width is 6 ft. 11 in. The seats are upholstered in moquette.



Naples bus at its Public Gardens terminal

The entrance to the Paris bus is unusual in that it faces to the rear, an arrangement that the management feels has safety features. The entrances in the other cities mentioned are at the side of the rear platform. All the properties are developing low-floor buses in which the rear platform is the first step and there is a riser from this platform to the floor of the bus. Fifty of these have been built for Paris. In nearly all of the cities, the driver's seat is alongside the engine or over it, to save over-all length.

As with street cars, extended use is made of aluminum in bus construction in Europe, particularly for side panels and dashes. Studies in the use of other light metals, such as lautal and elektron for body construction, have been made by the Berlin General Omnibus Company, which is using elektron now to a considerable extent in parts of the chassis, as well as for pistons, gear housing and wheels, with considerable saving in weight.

Solid tires are used almost exclusively in city service, but most of the companies have some buses fitted with pneumatics for suburban and interurban service. Hamburg leads with proportion of six-wheel buses owned, 85 of its 90 buses being of that type, and all of them being equipped with pneumatic tires. Paris also has a number, but London has only one and Berlin two or three. One double-deck six-wheel bus in Berlin has balloon tires.

A novel feature of the Paris tires is a device to prevent them from splashing mud on nearby pedestrians. It consists of a thin fin of rubber which is outside of the tire tread. It is the same diameter as the tread and is molded as part of the tire. Paris was the only city in Europe in which this method of protection was noticed by the author of this article.

Left—Brussels bus at a down-town stopping point. Right—Six-wheel low-floor Hamburg bus with pneumatic tires

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Awarded First Prize in Annual Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—14A

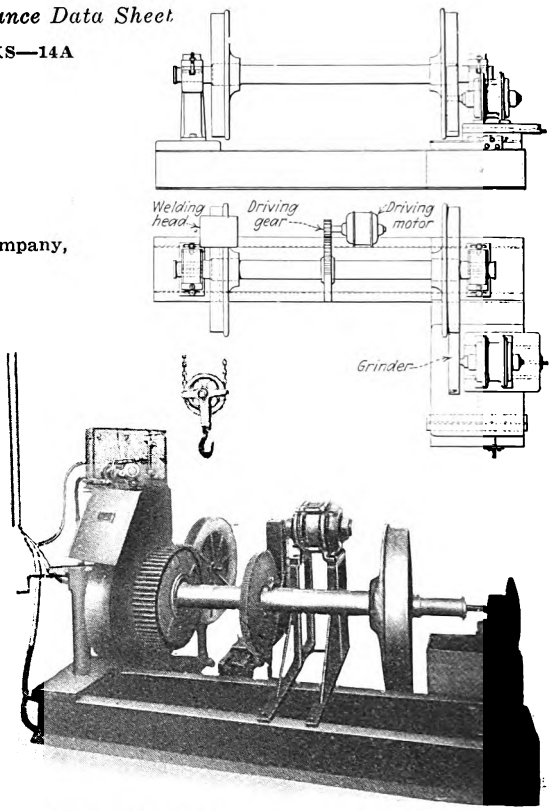
Grinding and Welding Wheels at the Same Time*

BY JAMES A. DUFFY

Superintendent of Equipment Monongahela-West Penn Public Service Company, Fairmont, W. Va.

BY MEANS of a special machine in the shops of the Monongahela West Penn Public Service Company steel wheels are ground to proper flange and tread contour while the automatic electric welder builds up worn portions. By this arrangement one man can grind wheels, weld them with the automatic head and at the same time do miscellaneous hand welding. This has eliminated the wheel lathe as a necessary machine tool and the work has been speeded up considerably. A saving in machinist's time has resulted of about three hours per pair of wheels.

The machine consists of a bedplate with two upright brackets with bearings for supporting the mounted wheels. A variable speed motor drives the wheels through gearing which is attached to the center of the axle. This gives 5, 7 and 13 in. per minute of peripheral speed. The welding head is of an automatic type and is attached to the machine. While welding up the flanges on one wheel, the opposite wheel is being ground. Special shaped grinding wheels are used so as to shape the tread and flange properly, and these grinding wheels are motor driven. The machine and gearing were made in the railway shop.



Machine arranged to hold a pair of wheels while the flanges and treads are being built up by welding and then ground

*Submitted in ELECTRIC RAILWAY JOURNAL *Maintenance Contest.*

Awarded Second Prize in Annual Contest

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—9

Hacksaw with Quick-Release Latch for Blade*

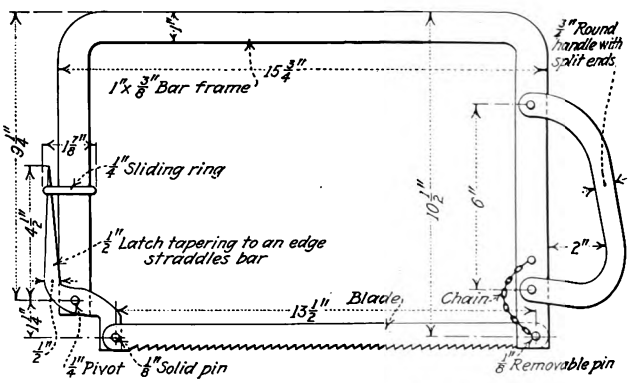
BY JOSEPH MERCIER

General Foreman Track Service Division, Montreal Tramways, Montreal, Canada

A STURDY hacksaw in which the saw blades are held tightly for use or release instantly when desired has been developed by the track service division of the Montreal Tramways, Montreal, Canada. The frame is constructed of a mild steel bar 1 in. x ⅜ in. x 34 in. long, and is bent to form three sides of a rectangle with one leg an inch longer than the other. This longer leg is slotted to receive the saw blade, which is secured in place by a pin fastened conveniently to the frame by a short chain.

The opposite end of the saw blade is held by a mild steel "Z"-shaped latch which straddles the end of the other leg. This latch revolves on a pivot and may be tightened to bring any degree of tension to the blade desired by pressing on the sliding ring that secures it. A substantial ¾-in. mild-steel handle is riveted solidly to the frame.

With this hacksaw the blade is held rigid at all times, and yet on the approach of a car the blade may be released instantly to be left in the rail providing it will clear the wheel flange. Formerly many blades were broken while being removed quickly from a tight cut.



Hacksaw with quick-release attachment for blade

*Submitted in ELECTRIC RAILWAY JOURNAL *Maintenance Contest.*

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Awarded Third Prize in Annual Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—15

Adjustable Mandrel for Babbitting Journal Brasses*

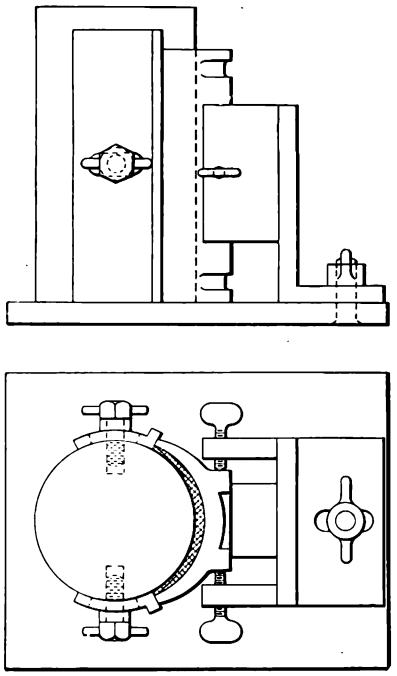
BY CHARLES HERMS

General Foreman San Diego Electric Railway, San Diego, Cal.

THE accompanying drawing shows a mandrel used by the San Diego Electric Railway for rebabbitting its journal brasses. This is adjustable so that various types can be poured on the same mandrel so long as the bore does not vary.

The adjustable feature of the mandrel reduces the time necessary for setting up to rebabbitt a bearing and assures perfect alignment so that additional machining is unnecessary. They can be placed in service without danger of their running hot due to improper alignment with the axle. By means of the side adjusting plates, an odd brass can be rebabbitted to the same thickness as standard brasses.

In pouring, the bottom of the mandrel base plate is marked to indicate the position of the back of the brass, in order to insure that this squares up and has the proper thickness at the bottom. The top is then adjusted to a gage, and the thumbscrews on the side of brass are tightened. The side adjusting plates are then moved up so as to close the gaps at the edges of the brass. The sides are then sealed with molder's clay and the babbitt is poured.



Journal bearing babbitting mandrel

*Submitted in ELECTRIC RAILWAY JOURNAL *Maintenance Contest*.

Awarded Fourth Prize in Annual Contest

Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—3

Reclaiming Steel Trolley Poles by Electric Welding*

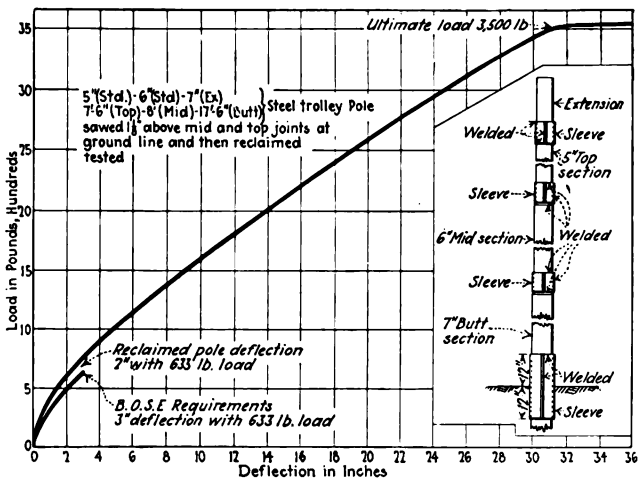
BY E. M. MILEY

Chicago Surface Lines, Chicago, Ill.

ORIGINALLY it was standard practice with the Chicago Surface Lines to set steel trolley poles without ground sleeves and with ornamental cast-iron collars around the joints. This method did not give protection to the poles from rust at the ground line and the ornamental collars formed rust pockets at the joints. As a result, after 25 years of service they are ready for the scrap heap. There are probably 25,000 poles on the system now in this condition.

Reclamation of these poles is now being carried out by a patented electric welding process that consists of welding a 24-in. beveled split sleeve to the pole at the ground line and an 8-in. beveled split sleeve at the joints. To determine the results of this method, a pole was cut into four pieces and was welded together with sleeves. When tested it was found that the welded pole had less deflection than a new pole under the same load. The results of the test are shown in the accompanying graph.

Recently two streets were widened to a 70-ft. roadway which required 500 steel poles, each 32 ft. long. In order to save the cost of new poles for this job, old 30-ft. poles were reclaimed and extended by using welded collars.



Load deflection curve on reclaimed 30-ft. 5-in., 6-in., 7-in. steel trolley poles. Insert shows method of installing sleeves on poles

Poles can be welded either in the yard or in place on the line by use of the patented copper defining bar, at 40 per cent of the cost of new poles. When welded in place the labor of resetting and stripping the pole is saved, which amounts to approximately $75 per pole.

*Submitted in ELECTRIC RAILWAY JOURNAL *Maintenance Contest*.

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News *of the* Industry

Seven Cents in Fresno

Following authorization by the California Railroad Commission the Fresno Traction Company, Fresno, Cal., has put into effect 7-cent fares. Three rides are given by the company for 20 cents. The increase of 1 cent was allowed on the application of the company.

To increase further the earnings of the company a general rerouting of the various lines has become effective. In the opinion of the commission this rerouting and increased fare will enable the company to earn 6 per cent on its investment of $1,325,000.

Wage Increase on Aurora Line

A three-year wage contract has been signed by the Chicago, Aurora & Elgin Railroad, Aurora, Ill., and its 450 employees providing for an increase of 1 cent an hour each year during the period. The rate for the current year will be increased from 75 to 76 cents for operators and from 63 to 64 cents for collectors until the maximum of 78 and 66 cents, respectively, is reached. Negotiations have been in progress since the expiration of the contracts last June.

Fare Testimony in Baltimore Continues

Charles D. Emmons, president of the United Railways & Electric Company, Baltimore, Md., testified before the Maryland Public Service Commission in a hearing on an application for an emergency rate pending action on a 10-cent permanent fare. The hearing has been under way for several days. Mr. Emmons was the first witness for the company. The municipality and several organizations are co-operating with the people's counsel in opposing an emergency rate.

In support of the company's application Mr. Emmons pointed out that the passenger revenue for the first eight months of 1927 shows a decline of $293,529 compared with the corresponding period of last year. Since 1920, he said, there has been a loss of 28,678,548 revenue passengers, or 11.29 per cent.

The president gave the percentage of earnings for each year since 1920 as follows: 1920, 5.5; 1921, 4.95; 1922, 5.33; 1923, 5.43; 1924, 5.39; 1925, 5.47, and 1926, 5.39. He pointed out that in the last seven years the company had not earned the 6 per cent minimum established by the courts as a fair yield. This has not been earned, he said, despite fare increases and the practice of the greatest economies.

Mr. Emmons held that the automobile was one of the principal reasons for the decrease in car riders. He submitted a chart to the commission, in which he dealt with this subject. It was his contention that the company had lost in 1926 70,000,000 passengers who otherwise would have used the service of the railway.

Operating costs also have increased, Mr. Emmons testified, due principally to the fact that many persons have moved to the suburban sections, thereby increasing the number of car miles necessary to haul the passengers.

Higher Rates Sought in Michigan City

A petition for an increase in fare from 5 to 7 cents on local city lines in Michigan City, Ind., was filed with the Indiana Public Service Commission on Sept. 3 by R. R. Smith, receiver for the Chicago, South Bend & Northern Indiana Railway. The petition requested that the company also be authorized to sell four tickets for 25 cents with free transfers. It was brought out in the petition that a deficit of $25,245 existed at the end of 1926.

Rapid Transit Practical for Cincinnati

Beeler report suggests tying in line with city railway under co-ordination of all forms of local transportation. Report well received by Cincinnati Street Railway and by local papers

THE Beeler report on rapid transit for Cincinnati, Ohio, was delivered on Sept. 9 to the Rapid Transit Committee. It is a document of 166 pages. The studies which he made led John A. Beeler, the author of the report, to the following conclusions:

1. The rapid transit line, if it were to be operated independently and without a system of transferring between it and other transportation agencies in Cincinnati, would carry only 6,060,000 revenue passengers the first year.

2. If it were to be operated as a part of a unified system comprising also the cars and buses of the Cincinnati Street Railway, the rapid transit line would carry 37,400,000 revenue passengers the first year, but most of these would be drawn from the present street railway system without the possibility of a saving in surface car service sufficient to offset the loss

3. With a gradual merging of the independent bus lines with the unified system under a plan that would require the least expenditure on the part of the system, thus adding substantially to the traffic on the rapid transit and street railway lines, the operating loss from taking over the subway would be gradually overcome.

4. All of these conclusions are based on carrying out a number of important additions to the subway and changes in the existing surface system, among the most important of which are:

(a) Extending the subway from Central Parkway and Walnut to Fountain Square.

(b) Extending the line to Oakley and tying it in by a surface connection with Madisonville and Mariemont.

(c) Relocating the Ludlow station at Knowlton's Corner.

(d) Securing the Cincinnati, Hamilton & Dayton Railway as a tenant and serving the College Hill territory by that line.

(e) Establishing prepayment stations for the easy and rapid interchange of passengers between surface and rapid transit cars.

Mr. Beeler says the practicability of a rapid transit line in Cincinnati has long been a moot question since most of the interurbans seeking better entrance to the business center have been eliminated. Upon the proper settlement of the question of the advisability of rapid transit as a betterment to the local transportation facilities may hinge the future greatness of the city. The population of the Cincinnati metropolitan district is about one-third that of Boston or Philadelphia, one-fifth that of Chicago, and less than one-tenth that of New York, but its transit project is not disproportionately large. In fact, the rugged topography and the wide spread of the industrial sections emphasize the necessity for it there.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Sept. 19-23—American Welding Society, national meeting, Book-Cadillac Hotel, Detroit, Mich.

Sept. 26-30 — National Safety Council, annual congress, Hotel Stevens, Chicago, Ill.

Oct. 3-7—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.

Oct. 18-21—National Association of Railroad and Utilities Commissioners, thirty-ninth annual meeting, Baker Hotel, Dallas, Tex.

Oct. 26-27—Public Utilities Association of West Virginia, annual convention, Parkersburg, W. Va.

Oct. 26-27—Society Automotive Engineers, Transportation Section meeting, Hotel Sherman, Chicago, Ill.

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As Mr. Beeler sees it, Cincinnati's topographical condition is responsible for the inception of the rapid transit line and for most of its local transportation troubles. Since the local transportation situation has recently been made the subject of negotiations resulting in the settlement of many troublesome questions, Mr. Beeler sees a clear field for mutual consideration of this important matter and a basis for working out a plan of operation that should leave little room for differences of opinion. According to him with a fixed return on the company's investment and a control by the city that wisely exercised must work to the distinct advantage of the public, an ideal condition exists. He says:

There is a general and prevailing belief in Cincinnati that the Rapid Transit Line to be used and useful must be a part of a city-wide system. In our opinion, too, this is a prerequisite to the whole undertaking. It is, therefore, quite unusual in that the city finds itself in the unusual position of negotiating through one branch of its government with the company for the operation of the Rapid Transit Line and of having the authority to approve or disapprove through another branch of its government the results of these negotiations. Far from opening the way to a disagreement or a deadlock, however, this condition will act toward facilitating an agreement on a sound basis far beyond what might be expected if the company were not under city control.

The problem, therefore, simplified and stated bluntly, is whether the people of Cincinnati, having put $6,100,000 into an enterprise that is useless unless $10,600,000 more is spent, can spend the additional amount on the ground that it will be of great advantage to the city as a whole and can ultimately be expected to pay a return on the additional investment at least. To answer this question explicitly, we would say that it can be done, but only with the maximum amount of co-operation, patience and fostering care, especially in the early years, and involving as the first step the unification of all local mass transportation into the one city-controlled system and diverting all possible business to the unified system, through such city control.

He expresses this opinion:

The new line will open up such sections and make it possible to reach an enlarged territory with a minimum cost.

The mere building of the line will advance business activity, while its operation will do much to force Cincinnati ahead, add to its prestige, relieve the ever-increasing congestion of traffic in the center of the city, increase property values and aid industrial enterprises by supplying their employees with rapid transit at a low cost. Of so great an advantage will this undertaking be that the community can well afford to pay the cost of carrying the investment for the early years, at least, if there is a reasonable hope that it can be made to pay its way later, and our conclusion is that this can be realized.

The city that 50 years ago built its own railroad through two states to the south to increase its commercial prosperity and pioneered with the greatest municipal university to perpetuate its social and cultural life should not be daunted today by a relatively small expenditure to insure its future prosperity. The foundation for a great city was laid by the forefathers who reckoned in results and not in first costs.

Be There for the Opening!

FOR the first time in the history of the American Electric Railway Association the executive committee has agreed to open the convention exhibit on Saturday. It urges early attendance. The New York special train leaves Friday night, arriving Saturday morning. Special cars carrying delegates from St. Louis begin to leave that city Friday. Some of the other delegations, however, are not scheduled to arrive until Monday.

Despite the fact that Wednesday will be set aside entirely for the inspection of exhibits, the tendency among delegates is to see the show at once upon arriving. By getting to Cleveland early this can be done before the sessions are scheduled to begin and without detracting from the value that attaches to the all-day inspection on Wednesday. There is a great deal to see. Get there early if it is at all possible to do so! The executive committee urges it. Moreover, you owe it to yourself to do so.

The significant question Mr. Beeler propounds is: "Will the present generation falter, even though the project cannot be made self-sustaining from the start?"

It was the need of obtaining a disinterested and enlightening answer that led to the employment of the Beeler Organization by the city of Cincinnati and the Cincinnati Street Railway, the first representing the taxpayer and the second the car rider, upon whom in some proper proportion will fall the cost of completing and operating the line if that is decided upon.

How the Railway Feels

Walter A. Draper, president of the Cincinnati Street Railway, said that a complete and definite opinion of the Beeler report could be given only after it had been carefully analyzed. He said in part:

The conditions which Mr. Beeler states as requisite and precedent to the successful operation of the rapid transit line are not easy of accomplishment; in fact, it cannot be stated with certainty that all of these necessary conditions can be accomplished. One necessity he points out is the diversion to the rapid transit and surface system of all riders along routes of that system or in territory tributary thereto. In other words, there would have to be an elimination of any duplication of service and motor coach lines would be limited to territory that would not be served by the rapid transit and surface system. It is questionable how soon and how completely this could be accomplished. Other necessities are the serving of College Hill by the interurban line now there together with bus feeders, and also the serving of Cumminsville by the rapid transit line with bus feeders. These, and similar things which he indicates must be done in order to insure the success of the operation of the Rapid Transit Line, cannot be done arbitrarily. The report is very clear on these matters and points out just how much will be lost to the new system by inability to carry out any one of his suggestions.

I have previously outlined the position of the Cincinnati Street Railway that if the rapid transit line can be operated in connection with the surface lines as part of one system so that a reasonable rate of fare will provide for the operating costs of the enlarged system plus the taxes and fixed charge of the present system as operated by this company, we are desirous of joining with the city in putting this structure to good use. It is quite desirable that the rapid transit line even to the extent now built shall not lie idle and unused.

On the other hand, it is a prime necessity that the existing transportation system, which is being improved each day to serve more adequately the people of Cincinnati, shall not be impaired or endangered either physically or as to its credit, since even with the completion of the rapid transit line the greater number of the traveling public will have to depend wholly or in part on the present system.

Under the plan of city control and a provision that the rate of fare shall be no more than the actual cost of giving the service, including a fixed return to the investors, the city is vitally interested in seeing that no mistake is made by which its transportation system might be called upon to assume a greater burden than it can carry.

How Shall the Cost Be Met?

The question of practicability not only is involved, but there is also the problem of how the cost of building and operating the rapid transit line shall be distributed equitably between the general tax payer and the car rider. It is recognized, as Mr. Beeler has so clearly pointed out, that the operation of the rapid transit line will be a benefit to the city in relieving traffic congestion and in making new and remote sections of the city more readily accessible, thus opening up new territory for development and adding to the taxable values. It will add to Cincinnati's importance and prosperity in manifold ways. In these circumstances the public which uses the transportation facilities, that is, the car riders, should be called upon to pay for the additional and improved facilities offered by the rapid transit line only to an extent that is consistent with a reasonable rate of fare, adequate service and the maintenance of the system in good condition.

Fortunately the problem of dividing these costs equitably is one on which with proper understanding it is impossible for the company and the public to be arrayed on opposite sides, because the public itself is just as much interested as the company in seeing that any arrangement made is one that will be both practicable and equitable.

Mr. Draper promises a careful and detailed study of Mr. Beeler's report without delay from the point of view of the principles established in the city control and service-at-cost franchise, under which the company is operating and which so clearly fixes the responsibilities and protects the interests of the city, the riders and the company.

All four Cincinnati papers received the report favorably. The opinion of all of them was, perhaps, best reflected by the Cincinnati *Enquirer*, which for several years has included under the caption "The *Enquirer's* Platform for Cincinnati" the item "Building of Rapid Transit System With a Workable Plan of Operation."

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New York Bus Hearing Sept. 26

The New York Transit Commission has set Sept. 26 for the first hearing on the application of the Equitable Coach Company for certificates of convenience and necessity covering the operation of bus lines in Manhattan, Brooklyn and Queens. Franchises for these were granted to the company by the Board of Estimate several weeks ago. It is expected that there will be strong oppositions to the granting of certificates. The Fifth Avenue-New York Railways interests in Manhattan are expected to oppose the granting of certificates for the cross-town lines in Manhattan and the Brooklyn-Manhattan Transit Corporation interests are expected to oppose certificates for Brooklyn, as the Coney Island & Gravesend Bus Corporation, a subsidiary of the Brooklyn-Manhattan Transit, was an unsuccessful bidder for the Brooklyn franchises. The franchises are subject to the approval of the commission on the basis of the convenience and necessity of the service intended to be given.

The Surface Transportation Corporation, a subsidiary of the Third Avenue Railway, has been granted a certificate of convenience and necessity by the Transit Commission authorizing it to operate twelve bus lines in the Bronx. The plan of financing the new bus service was also approved, the corporation being authorized to issue 1,000 shares of capital stock of a par value of $100 a share, to provide working capital of $60,000 and $40,000 as a guarantee to be deposited with the City Comptroller. Slaughter Huff, president of the bus company, stated recently that it was the intention of the management to purchase 104 buses.

Fares on the bus routes will be 5 cents, with a 5-cent transfer fee to ten lines which the company has applied for in the Borough of Manhattan.

Buses to Run in Reno

The Reno Traction Company, Reno, Nev., suspended operation on Sept. 7. The line is to be scrapped. Buses have supplanted the railway system. The system was one of only 8 miles. It was until recently the sole survivor among the few roads built in that state.

Trial Service on Decatur, Ill., Route

The Illinois Power & Light Corporation has started bus line service on the Riverside route in Decatur, Ill., for a six months test period and suspended the railway service in that district. Two large buses are in the service.

Buses to Operate Between Chicago and Aurora Terminals

The Western Motor Coach Company has been granted a certificate of convenience and necessity to operate buses between the Chicago and Aurora terminals of the Chicago, Aurora & Elgin Railroad. Col. Edward Blair, general manager of the road, said it would be about Nov. 1 before service was instituted. Six daily trips each way are proposed. Permit to operate between Geneva and Chicago and Elgin and Chicago is also to be sought.

Higher Fare Sought in St. Paul

The St. Paul City Railway, St. Paul, Minn., has petitioned the Minnesota Railroad and Warehouse Commission for an increased rate of fare to enable it to pay 7½ per cent on a valuation of $16,503,557. A hearing has been set for Oct. 14. Fixed tentatively in 1926, the rate is 8 cents cash and six tokens for 40 cents. It is believed that a minimum rate of 7 cents or more will be required to avoid a deficit which was shown in 1926 and which is the outlook for 1927. The petition cites that the return in 1926 was 4.42 per cent and based on figures for seven months will be 4.64 in 1927. The company arrived at the figures mentioned by taking the commission's valuation of 1925 and adding capital improvements made by the railway up to Jan. 1, 1927, or more than $300,000.

In a fare decision of two years ago the commission said a higher rate of fare than then specified should be allowed the company, but it suggested certain remedies by the Council to let the rate be as low as in Minneapolis. An enabling city charter amendment presented to the voters was turned down in the fall of 1926 and again Sept. 6. This amendment allowed the city $200,000 a year to take care of paving between tracks, sprinkling, sweeping and cleaning the tracks of snow and ice, and would have saved the company something like $115,000 annually in a relief from these duties specified in the city charter.

T. Julian McGill, vice-president of the Twin City Rapid Transit Company, the holding organization, said that after exhausting every effort for two years "we have failed to get relief from unnecessary and unfair expenses which the carrier must pay. The company is now facing the necessity of refunding in the near future its bonded indebtedness and therefore it is essential that the earnings of the St. Paul City Railway be brought up to that authorized by law and agreed to by the City Council, the Railroad and Warehouse Commission, the United States Court and the company. The company will continue to give St. Paul its fullest co-operation."

Although the company is earning a reasonable return in Minneapolis at 8 cents and six tokens for 40 cents, St. Paul earnings in 1926 were $500,000 below the necessary figure at the same rate of fare.

Economies recently proposed in St. Paul included the introduction of one-man cars, operation of short lines, rerouting of four lines and the elimination of owl cars on every other parallel line.

Details of Oklahoma Railway Purchase Made Public

Purchase of the majority of the preferred and the common stocks of the Oklahoma Railway, Oklahoma City, Okla., by a group of Oklahoma City citizens was officially announced on Sept. 6. The sale was made by the Southwest Securities Company to the following Oklahoma City people: William Mee of the Security National Bank, T. C. Thatcher of the Oklahoma City Mill & Elevator Company, A. E. Monroney of the Doc & Bill Furniture Company, H. R. Hudson of the Oklahoma City, Ada & Atoka Railway, O. A. Campbell of Campbell & Price, contractors, and G. A. Nichols of G. A. Nichols, Inc., real estate. New officers of the company will be: H. R. Hudson, president; G. A. Nichols, vice-president; Charles Hoopes, secretary; Reba Zimmerman, treasurer. The latter two are at present officers of the company.

The price paid to the Southwest Securities Company was $275,000 for 29,828 shares of the common stock and 8,522 shares of the preferred stock. This is approximately 70 per cent of the outstanding stock.

The financial structure of the Oklahoma Railway is as follows:

Common stock issued, par value $100 a share	$3,800,000
Preferred stock issued, par value $100 a share	1,795,900
Junior mortgage 6 per cent bond due Jan. 1, 1927	290,000
An unsecured 5 per cent note for	100,000
Collateral trust note 8 per cent, due Jan. 1, 1928	825,000
Underlying and first and refunding bonds, due in 1928 and 1941, 5 per cent	4,947,000

The purchasers have also acquired a majority of the $290,000 junior mortgage bond issue and the unsecured 5 per cent note for $100,000, also the Belle Isle Boating Company, a subsidiary of the Oklahoma Railway.

The property purchased comprises 65 miles of city railway and 75 miles of interurban railway. The lines are equipped with 129 cars. In addition, there are 26 buses. The power plant belonging to the company furnishes current for railway consumption and for the cities of Edmond, Guthrie, Cashion and Yukon, and the many industries located on its lines.

The Oklahoma Railway has been in the hands of the receivers since Dec. 27, 1924. The results of operation under this receivership have been better than in any previous years. The rapid growth of Oklahoma City is largely responsible for increase in business, according to those who are interested in the company, and anticipated future growth furnishes the motive for the purchase of the property.

Immediate operation of the property will remain unchanged, as it is necessary to confer with the court for its approval of the reorganization plan. The purchasers hope to lift the receivership within the next 30 days. Engineers have been employed to study the physical property and suggest additions and betterments.

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Personal Items

Rochester Shoppers Use the Street Car

Eighty-nine per cent of the shoppers of Rochester, N. Y., use the street cars in going downtown, it was revealed by a survey conducted by Boy Scouts under direction of the Rochester Engineering Society. The Scouts interviewed all shoppers in sight and found only 11 per cent went in automobiles. A proposed ordinance to eliminate parking downtown between the hours of 4:30 and 6 p.m., the rush hours, brought about the survey, the results of which, backers of the proposal claim, showed that such a plan would not inconvenience any large proportion of the public.

Bond Application of Brooklyn Company Denied

The New York Transit Commission on Sept. 7 denied the application of the Brooklyn-Manhattan Transit Corporation for a rehearing on its proposal for an issue of $20,000,000 of ten-year 5 per cent gold bonds for equipment purposes, the bonds to be sold by the New York Rapid Transit Corporation, the operating company, to the B. M. T., the holding company, at a price of 80.

The original application of the company was denied several weeks ago after the proposal had been condemned by Samuel Untermyer, special counsel for the commission. In its application for a rehearing the company said the commission had exceeded its powers, confusing its duties as a regulatory body with its duties as agent for the city under Contract No. 4.

It is expected that the company will appeal to the Appellate Division for a writ of certiorari, thus making certain a court review of the matter. This, too, had been anticipated and the application for a rehearing was regarded as a necessary preliminary to court action.

Mr. Untermyer contended that the selling of the bonds of the operating company to the holding company at 80, inasmuch as it would yield only $16,000,000 to the operating company, would cause a loss of $4,000,000, ultimately, to the city, in the event of the recapture of the city-owned lines as provided for under contract 4 and as contemplated in the proposed unification plan.

Gain in Rides on Chicago Surface Lines

For the first seven months of 1927 the increase in riding on the Chicago Surface Lines, Chicago, Ill., over a similar period in 1926 was 9,656,768. Only June and July showed decreased business. The report showed that nearly 71,000,000 of the July rides were on original payment of fare and nearly 54,000,000 were on transfers. Free passengers totaled 3,600,390. For July divisible receipts were $268,682 after expenses, taxes, interest on purchase price and other charges, against $417,814 in June and $310,840 in July, 1926.

Messrs. Venning and Clark Among Cincinnati Men Promoted

Several important promotions in the operating departments of the Cincinnati Street Railway, Cincinnati, Ohio, have been announced by J. H. Stewart, general manager. These advancements, which became effective on Sept. 1, are designed to take care of the company's new system of power distribution.

F. J. Venning will continue as superintendent of power, but in addition will have jurisdiction over the Pendleton power house and all operations incident to the production of power. He will have charge over the transmission lines to the point where current is delivered to switches in the substations and all feeder lines from the time they leave the substations, as well as the overhead trolley lines. Mr. Venning affiliated himself with the company in 1910 as superintendent of construction.

W. P. Clark, paving engineer, was promoted to assistant superintendent of track and roadway and will work under the supervision of J. H. Sundmaker, superintendent of maintenance of way. Mr. Clark will assist Mr. Sundmaker in handling the large program of track reconstruction work which is being carried on by the company.

H. L. Swift, assistant superintendent of maintenance of way, was appointed superintendent of substations and will have jurisdiction over the maintenance of present stations and the construction of the new stations, including the installation of the equipment. Mr. Swift formerly was with the American Window Glass Company, Monongahela, Pa.

J. A. Noertker, who entered the employ of the company in 1921 as a draftsman after his graduation from the University of Cincinnati, was appointed electrical engineer. He will look after the electrical engineering details connected with the installation of the new substations.

H. C. Genrich, who started with the company in 1895 as trouble lineman and rose to the office of electrician, was appointed chief electrician. He will continue to supervise the inspection and the maintenance of the present substations and will assist in the work of constructing the new ones.

Messrs. Robinson and Murray Advanced

A. E. Robinson and W. H. Murray have been made assistant purchasing agents of the Georgia Power Company, Atlanta, Ga. While Mr. Robinson has been assigned to the parent company, Mr. Murray will be connected with the Empire Construction Company, a subsidiary. F. A. Jordan, supervisor of purchases, announced the promotions.

Mr. Robinson has been with the Georgia utility for more than fourteen years, having served in the purchasing department for the past twelve years. Mr. Murray has been with the company for four years, the entire period having been spent in the purchasing department.

Changes in Wisconsin Property

John I. Allen has been named assistant secretary-treasurer of the Wisconsin Gas & Electric Company, Milwaukee, Wis. In this capacity he succeeds the late Emil Jorgenson.

G. N. Bingen was appointed auditor. He succeeds Mr. Allen.

H. R. Hudson Heads Oklahoma Railway

H. R. Hudson, elected president of the Oklahoma Railway, Oklahoma City, Okla., by the new owners of that property, is president of the Oklahoma City, Ada & Atoka Railway, which operates steam railway lines from Oklahoma City to Shawnee, Ada, Atoka and intermediate points.

OBITUARY

ZIBA F. GRAHAM, who established and built the first Washington, Ind., railway system and operated it until a few years ago, when he sold the line to the city of Washington, died at Conway, Mich., on Sept. 6. He also owned the electric light plant in Washington at one time. Mr. Graham was 74 years old. He was the father of Joseph B., Robert C. and Ray A. Graham, prominent automobile manufacturers.

FRANK GRAHAM JONES, former general manager of the Memphis Street Railway, Memphis, Tenn., died on Sept. 9 at the Mayo Clinic in Rochester, Minn. He went to Memphis from New York State in 1893 and became general manager of the old Citizens Railway. Under his management this company did much development work including the taking over of smaller lines and the double tracking of the east end line. He served as manager until the line was merged with the former Memphis Power & Light Company. In the ownership of the Memphis property he was for twenty years a partner of G. K. G. Billings. In 1918 Mr. Jones was appointed a fuel director for the District of Columbia by the United States Fuel Administration. He was 69 years old.

A. W. WEYKER, long connected with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., and in recent years in charge of the railway lines of that company in Racine, died recently.

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Manufactures *and the* Markets

Delegates Urged to Attend Exhibits Opening Oct. 1

Members of the exhibit committee are urging delegates to arrive in Cleveland in time for the opening of the exhibits at noon on Oct. 1, as this will permit leisurely inspection before the convention rush. Exhibits will be open to the public on Oct. 2, from 2 to 5 p.m. and on Oct. 5 from 7 to 10 p.m. The public showing is under the auspices of the Cleveland convention committee. By arriving on Saturday and viewing the exhibit en family, so to speak, delegates, it is thought, will gain a better idea of the big show, and will have time to discuss the features in a technical manner undisturbed by the public and the pressure of other convention business.

Virginia Electric to Double-track Ocean View Line

Officials of the Virginia Electric & Power Company, Richmond, Va., express their intention of beginning the double-tracking of the Bay Shore-Norfolk Street car line to Ocean View as soon as the right-of-way is clear. The company recently allocated $207,000 to the project.

Most of the right-of-way for the second track is clear and the company does not expect to have serious difficulty in completing it.

$750,000 for Power System Announced in Cincinnati

Contracts involving the expenditure of $750,000 for a complete new power distribution system of eighteen substations have been awarded by the Cincinnati Street Railway, Cincinnati, Ohio. The eighteen substations will be situated at various points throughout the city, and as soon as the new equipment can be placed in operation the railway company will purchase its entire power supply from the Union Gas & Electric Company, a subsidiary of the Columbia Gas & Electric Company, New York.

Officials of the railway state that the new arrangement not only will result in economy in operation but will provide the system with an adequate power supply, permitting faster and more dependable service throughout its system. With the thought of eventually obtaining all of its power from the Union Gas & Electric Company, the Cincinnati utility, in 1921, entered into a contract with the union company for the purchase of one-half of its power. The power the Union Gas & Electric Company generates is 60-cycle alternating current, while the generating equipment of the railways is 25-cycle. This has prevented an interchange of power between the two companies and the substations which were supplied with the Union Gas & Electric Company's power were equipped with converters which could not be hooked up with the Pendleton station supply. At times this condition caused considerable difficulty, as it made it impossible to feed sections of the system normally applied by one source with current from the other source.

Engineers of the railway have been engaged for more than a year preparing plans and specifications for the new substation layout.

First Come First Served Rule on Track Exhibit Space

Before he left on Sept. 15 for Cleveland, where he will establish headquarters of the exhibit committee in the Cleveland Auditorium, Fred C. J. Dell announced that in order to avoid traffic congestion near the auditorium the rule of "first come first served" will hold for exhibits to be placed on the track space.

"Assignments of track space have been forwarded to all exhibitors whose applications have come in," explained Mr. Dell. "While tracks have been assigned to certain companies, much depends on how the exhibit cars arrive in Cleveland.

"Charles H. Clark, engineer of maintenance of way Cleveland Railway, who is chairman of our special sub-committee on car exhibits, will have charge of placing all of the car equipment upon exhibition tracks. Owing to the necessity of eliminating any traffic delays on the busy thoroughfares near the auditorium, Mr. Clark will seek to handle cars so as to economize time in getting them placed in the exhibit area set aside for car displays."

"This means" explained Mr. Dell, "that while a certain company may have been assigned to a certain track, that carries no assurance that the company's car or cars will go on that track. These cars are to be placed in the exhibit area with the aid of a portable curved switch. The switch must be moved with a crane, attached to a work car and it is not practical to move the switch from one track to another, because every time it is moved the street cars on St. Clair Avenue and the automobile and truck traffic is delayed, at least that portion of it going in the westerly direction.

METAL, COAL AND MATERIAL PRICES—F. O. B. REFINERY

Metals—New York	Sept. 13, 1927
Copper, electrolytic, cents per lb.	12.95
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.125
Zinc, cents per lb.	6.25
Tin, Straits, cents per lb.	61.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons.	1.95
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons	†
Kansas screenings, Kansas City, net tons..	2.675
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20–5.70
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.0
White lead in oil (100-lb. keg), N.Y., cents per lb.	13.75
Turpentine (bbl. lots), N.Y., cents per gal.	61.0

This is Station A. E. R. A., Cleveland, Ohio
Fred Dell announcing

We are broadcasting a special announcement from the Cleveland Auditorium, where, on and after

September 19

all mail and wires on exhibit business should be addressed to

American Electric Railway Association
Fred C. J. Dell, Director of Exhibits
Cleveland Public Auditorium
Cleveland, Ohio

To facilitate deliveries to your representatives, address mail as follows:

Mr. .....

..... Company

Space Numbers .....

Attending A.E.R.A. Convention?

Cleveland Public Auditorium
Cleveland, Ohio

Tell the home folks to send boomerang mail — return address on each letter

Please Stand by for Further Announcements

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, September 24, 1927 *Number 13*

"Liberty" Wants a Statesman

ONCE more the street car is put on the defensive. Once more it is labeled "archaic." Even the editor of a high-pressure magazine like *Liberty* falls into the rut of opinion expressed by those who know little about the facts of traffic and local transportation. While calling upon the motor car manufacturers to produce a "Statesman of Transportation," in an editorial published in its issue of Sept. 17, 1927, *Liberty* summarizes the situation as follows:

> Numerous solutions of the problem [traffic congestion] have been offered, of course, but no one of them will do the job. *Street cars are on their way out as archaic.* Buses, taxis and subways give congested populations greater mobility. Chicago was the first to try double-deck streets. Other cities will follow.
>
> Two-level streets speed up traffic movement. In spite of these makeshifts, people get in one another's way and automobile jams are growing worse.
>
> The automotive industry has the most at stake in this situation.

Here are a number of statements which are of great interest to the local transportation industry. Taking the last one first, *Liberty* apparently starts with the wrong premise. The automotive industry has a lot at stake, to be sure. So also has the $6,000,000,000 electric railway industry. *Liberty* joins with Walter P. Chrysler and L. F. Loree in the superficial conclusion that the street car is on its way to the scrap heap. If these gentlemen are really interested in the status and future of street cars a trip to Cleveland during the week of Oct. 2 would help considerably to clarify their thinking.

It is not the automotive industry that has the most at stake in the traffic situation. It is the community itself which is losing the most and which will be called upon to foot the bill for whatever relief plans are undertaken. "Two-level streets speed up traffic movement," says *Liberty*. But who is going to pay for them? The automobile manufacturers? Certainly not! They didn't pay for the two-level street in Chicago, and their primary objective in producing a "statesman of transportation" would be to make sure they don't pay for them anywhere else. Of course, there isn't anything wrong with that. The responsibility of providing adequate thoroughfares for the movement of people in cities belongs to the community and to the property owners, the latter because greater accessibility increases the value of their holdings.

Even *Liberty* will probably agree that the community should and probably will pay the bill for facilities to reduce traffic congestion. It seems reasonable to assume also that the primary purpose of traffic relief is to permit people to move about in cities with greater speed, comfort and convenience. If that premise is granted, where does it lead? Certainly, our premise precludes the conclusion that traffic relief should be undertaken from the point of view of increasing the market for more automobiles.

It is at least interesting to pursue this reasoning just one step further. In the Sept. 17, 1927, Annual Convention Number of the JOURNAL, on page 485, E. J. McIlraith, staff engineer of the Chicago Surface Lines, expressed in rather vivid language some figures on relief of traffic congestion that are the outcome of several years of careful study and analysis. He says that one four-track electric line on specialized right-of-way can serve more people in the rush hour than 25 boulevards used by private vehicles alone. Certainly that is of some importance to the community which undertakes to meet the bill for traffic relief!

Liberty calls on the motor car manufacturers to take the lead and promises that the 20,000,000 car owners will gladly follow. What about the 16,000,000,000 passengers who annually depend for transportation on the electric railway lines of the country? Are they not entitled to consideration in approaching the problem of traffic relief? The country needs a statesman of transportation. But it won't get what it needs if he represents the very manufacturers whose product has caused our present congestion.

Onus for Delay in St. Louis on City

HOPE has been renewed that something tangible may come out of the moves now being made in St. Louis in connection with the affairs of the United Railways. These moves have to do with an appeal to the Public Service Commission for the approval of the securities intended to be issued under the terms of the reorganization plan and with the granting of a new franchise to the St. Louis Public Service Corporation, the proposed successor to the United Railways.

Many things have militated against the lifting of the receivership, not the least significant of which has been the attitude of the city toward the franchise and the financial affairs of the company. Some things, however, appear to be clearly defined. While Mayor Miller has outlined four tentative modes of procedure, one of which contemplates municipal ownership, he is set against this procedure. In this, of course, he is wise. He apparently is reconciled to a service-at-cost proposal, but has split with the company over the allowed rate of return. In addition he has not seen his way clear to accept the value of $60,000,000 which the reorganization committee made plain it was willing to have fixed for its property. This appears to have been a real concession, for the general belief is that the commission, if the company insists upon it, must fix a value for the property much in excess of this amount.

Meanwhile the city talks through the Mayor about the need of it having expert advice. Such advice it has had in the past and is entitled to in the future. Only recently one of the country's most prominent utility experts has reported to the Mayor findings not yet made public in full, but said to contain recommendations for co-ordination, with operation on a service-at-cost basis. St. Louis is entitled to all the advice it can get, but it does seem that the city has not availed itself fully of recommendations that have been made in the past. That is unfortunate.

Not all the moves made in a receivership that has

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existed since 1919 can even be indicated in comment of this kind, but one thing is certain, the disposition on the part of the representatives of the security holders has not been to prolong the receivership. In fact, the decks were cleared for financial action about three years ago. The city should develop a policy and proceed to the work of negotiating with determination; determination that will take fully into account the rights of the company and the city's future needs so far as it is possible to prognosticate them. Let it not seek the unattainable. As Federal Judge Faris pointed out in approving the sale of the St. Louis properties at foreclosure, any suggestion of a return to the 5-cent fare is not even respectable nonsense, pointing out that while fares have advanced from 5 to 7½ and 8 cents, the expenditure for wages, equipment and materials by the company in the same period have advanced 81 per cent. This seems generally to be realized in city circles. So with the need recognized that the company must have a living wage, it ought not to be difficult, if the city approaches the matter in the right spirit, to adjust satisfactorily the matters that have up to this time militated against the settlement. The onus for the delay appears to be clearly upon the city.

The Wording of an Ordinance Penalizing Transfer Abuse Is Important

EVEN in doing a meritorious act there is always a right way and wrong way. The city of St. Louis found this out recently when an effort was made to enforce one of its ordinances punishing abuses of street railway transfers. The ordinance declared it to be unlawful to sell, barter or exchange for any consideration a street railway transfer, or even to give it away to enable another person to use it, or for any person to whom such a transfer was not issued to attempt to use it, or for him to punch or alter the punching of such a transfer, or to attempt to make a round trip by use of a railway transfer. Agents and employees of the railway company issuing transfers to passengers lawfully entitled to them were excepted.

The purpose of the law was entirely meritorious. In a prosecution under it, however, the Supreme Court of Missouri in a decision rendered June 27, 1927, held that the ordinance prescribed the use that might be made of transfer tickets and thereby invaded the province of the Public Service Commission. If, for example, the commission should make these tickets transferable, the ordinance would then be in conflict with the commission's ruling. The fact that the ordinance prescribed a course which coincided with the rulings of the commission did not help the situation because "the city of St. Louis was without the power to regulate to any extent, directly or indirectly, the rates of a public utility, or to prescribe regulations or practices which affect such rates."

While the court thus condemned the wrong way of stopping transfer abuses, it also pointed out the right way. This, it said, was to require under penalty that the individuals composing the public in their dealings with the utility shall observe its rules and regulations, as these rules presumably have had the approval of the Public Service Commission. An ordinance of this kind would avoid any invalidity on the ground that the city was exercising, or attempting to exercise, a control over rates and charges.

It may be assumed that with this legal background the city will amend the ordinance accordingly.

Two Track Reports of Unusual Interest

IN THE American Electric Railway Engineering Association this year two committees in the way and structures division have been working on subject assignments in which way departments throughout the industry are vitally interested. One of these committees is investigating the use of alloys other than manganese steel for special trackwork and the other is studying the subject of rail corrugation. While it is not expected that either committee will be able to conclude its work this year or that definite conclusions may be presented, it is reasonably certain that both committees will have some interesting data to present and that the reports will represent valuable contributions to the present knowledge on the respective subjects.

Manganese steel has served its purpose very well, but without heat treatment it is very difficult to secure a good weld, and heat treatment in the field is not practicable. These things have led the electric railway engineer to seek a substitute that would lend itself more readily to field welding and at the same time possess the necessary shock and abrasion resistive qualities, and thus postpone as long as possible the date of replacement. The advances made in the art of electric welding, both in the matter of equipment, technique and welding material employed, have been largely responsible for this demand for a substitute for manganese steel.

The cause of rail corrugation and its cure have long been subjects for discussion among street railway men. Rail corrugation also has attracted considerable public attention because of its noise-producing effect. Much has been written about it and many reasons advanced as to its cause. Still it seems to occur under so many different conditions that it would appear we really know very little about it. Considerable scientific study has recently been given the subject abroad and it is sincerely hoped that we may finally diagnose the ailment correctly and thus remove one of the most annoying and expensive troubles with which the street railway engineer has had to contend.

"Hand Grasps Hand, Eye Lights Eye"

TENSION is growing throughout the industry as the opening day for the Cleveland convention draws near. Machines and appliances that will tell the physical story of progress are being rushed to the exhibit hall. Those who are charged with revealing the mental story of what has been achieved, of what they believe lies beyond the inscrutable veil of the future are weaving thoughts into words. Speaker, exhibitor and delegate are realizing the great responsibility that such a congress imposes. It is inspiring to think of this great machine of human and material parts gradually gathering momentum and tuned for full speed ahead when the president's gavel shall give the signal.

Yet the whole concept of machines, speeches, debates and constructive legislation is as sounding brass and tinkling cymbal if one neglects the spirit that motivates the gathering. For more than twoscore years men of the electric railway industry have seen mechanical miracles in their field. They have seen a crude crawling vehicle, an unstable experiment, become the swift and powerful servant of mankind. They have trod the heights of success and groped through the valleys of failure. Spurred on by machines? No! but by the faith and trust of their co-workers. That has been revealed through gradual

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culture of kind intercourse. Confidence in a man's friendship has meant more than the stereotyped phrases of a contract; faith in each other's word more than the scintillating perfections of steel and wire. To deny that acquaintanceship is the loom upon which is woven the material good of these conventions the JOURNAL thinks is impossible in the light of its years of observation. Impossible, when each of us has found that these contacts are "the mysterious cement of the soul, sweetener of life and solder of society."

What joy, then, is in store for us during the first week in October, when

> Hand clasps hand, eye lights eye
> In good friendship
> And great hearts expand
> And grow one in the sense of this world's life.

Discretion in the Payment of Income Bond Interest

ANOTHER interesting financial question which involves the issue of the possible substitution of the judgment of outsiders for that of the corporation management has arisen in New York. A holder of $35,000 par value of adjustment income bonds of the Third Avenue Railway threatens suit to compel payment of the full 5 per cent annual interest, although on this issue there is a present accumulation of 27¾ per cent as of Oct. 1.

It is a nice point in corporate management that is raised. Under some circumstances the threatened action might be justified, but not in the present instance. At the outset there is dispute about a question of fact between the threatening litigant and the management. The man about to sue says he has employed counsel to estop the company from using the property of the bondholders for capital purposes "in direct violation of the trust indenture securing the bonds." The management says that the indenture provides that disbursements on the bonds are at the discretion of the directors. The latter seems to be the more reasonable of the two provisions, for it is in accord with the general theory which applies to an issue of this kind.

Questions of law and of fact may have to be passed upon, but there can be no question about the wisdom of the policy of the management. It would seem reasonable to assume that the holder of a security of this kind labors under no delusion about the type of security he is purchasing. He knows that financially its ownership implies hazards. And those hazards are lessened for him only as the management exercises caution. It might, it is true, seek as soon as possible to liquidate the payments that have accumulated and denude the property of cash so quickly as to leave it again in the position out of which grew the necessity for issuing the income bonds. If it did that knowingly, it would not be true to its trust. And the present management of the Third Avenue Railway has been true to its trust.

Operations for the year ended June 30, 1927, showed approximately $250,000 above the 5 per cent on the adjustment bonds, but some of the last year's earnings were non-recurrent in character. So well did the company do, however, that extraordinary payments of about $650,000 were made out of surplus for expenditures not chargeable to operating expenses. The credit of the company is, of course, none too good, and in order to avoid the sale of securities at a sacrifice, the company has for the last ten years financed itself out of the surplus. Despite this the railway has in its treasury available for all purposes about $1,500,000. This is none too much considering that the company has been confronted with conditions extraordinary in their possible adverse affect. These have not been entirely removed by the granting of bus franchises to the railway in the Bronx, though the action of the Board of Transportation in so recommending would appear to have helped the situation immeasurably. The owner of the bonds, however, sees the matter differently. He pretends to scent disaster ahead in impending expenditures for bus operation.

Under the fast changing conditions in New York City with respect to population and modes of movement available to the prospective passenger, transportation men are agreed that its management has in many respects worked wonders with the Third Avenue Railway. But that apparently is not a judgment which weighs very much with the holder of these securities, by their very nature speculative in character, to whom immediate prospects are much more important than future potentialities. The projected suit deserves the dignity of mention only because it shows the length to which the holder of securities will go who is intent upon exacting his immediate pound of flesh.

Replenish Your Well of Ideas

FEW men generate ideas. Rare is the individual who can draw water from his own well, for that is one of the marks of genius. We cannot all aspire to genius, but we can nevertheless progress and improve by utilizing the experience of others. The coming convention affords a well of ideas, constantly replenishing, from which every member may draw a bucketful of transportation working facts.

The meetings of the American Association and affiliated associations will present a valuable picture of the industry as well as a cross-section of it. Financing, traffic regulation, franchises, advertising, fares, valuation and other subjects of importance will be discussed at round-table conferences. The progress in the industry will be stressed; feature accomplishments of the year on properties in different parts of the country related in five-minute talks by operating executives.

Questions to be asked and answered include "Does aggressive property-wide rehabilitation pay?" "How are you meeting the transportation needs of your community?" "How did you change an unprofitable bus operation to a highly profitable one?" and others vital to the industry. At the meeting of the affiliated associations important problems and various phases of accounting, claims, engineering, transportation and traffic will prove other wells from which to draw.

It is indicated that there will be some surprises in store for delegates in the way of new car and truck designs which will prove well worth studying. It is also promised that this year "the exhibit will be the greatest display of local transportation equipment the world has ever seen." De luxe cars and buses, articulated cars, the latest designs in lighting, heating and ventilating and upholstery will be displayed. Fare boxes, motors, track equipment, car and bus seats, wheels, steering gear and the many other exhibits all offer suggestions for providing better transportation.

Delegates to the convention will have a real opportunity to draw deeply from a well that sparkles with new ideas—provided they go to Cleveland determined to get full value for their money.

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Fountain Square, Fifth and Walnut Streets, Cincinnati—Proposed terminal of the rapid transit line

Co-ordination Essential for Rapid Transit in Cincinnati

ARTICLE I

Report of Beeler Organization to the city shows that the only practical way to use existing investment in subway lines is in conjunction with the street car and bus system. This article, the first of two, shows the physical plan for extending the subway line

UTILIZATION of existing facilities to the greatest extent is the outstanding feature of the report on rapid transit recently made by the Beeler Organization of New York. The report was presented to the special committee representing the Council and Board of Rapid Transit Commissioners of the city of Cincinnati and the Cincinnati Street Railway on Sept. 9, as outlined briefly in this paper for Sept. 17, page 534.

The report goes into great detail to determine what should be done to provide rapid transit for Cincinnati, and whether a rapid transit system should be operated independently or in conjunction with other facilities. The following article and the one to appear next week are abstracted from the report, which is a printed volume of 166 pages.

In many respects the transit situation in Cincinnati is unusual. As early as 1912 a rapid transit commission was appointed, the primary purpose being to construct an entrance into the central business district for the various interurban lines reaching the city. Later studies modified the plan and in 1916 the construction of a line was authorized and funds were appropriated. Due to the war the project was deferred, but since then the entire amount of $6,100,000 has been spent in construction of the line. About 10 miles of double-tracked right-of-way is largely completed.

A portion of the route is along the bed of the old Miami and Erie Canal, which has long been abandoned. The topographic map on page 543 shows the location of the line. The portions between Canal and Walnut Streets and Fountain Square and between Forest and Oakley have not been built. The remainder is a combination of subway and open cut. The stations are completed only in the rough, and none has been built between Clifton and Oakley or at Fountain Square.

In the intervening period since the project was begun most of the interurbans have been abandoned and those remaining have suffered decided decreases in their busi-

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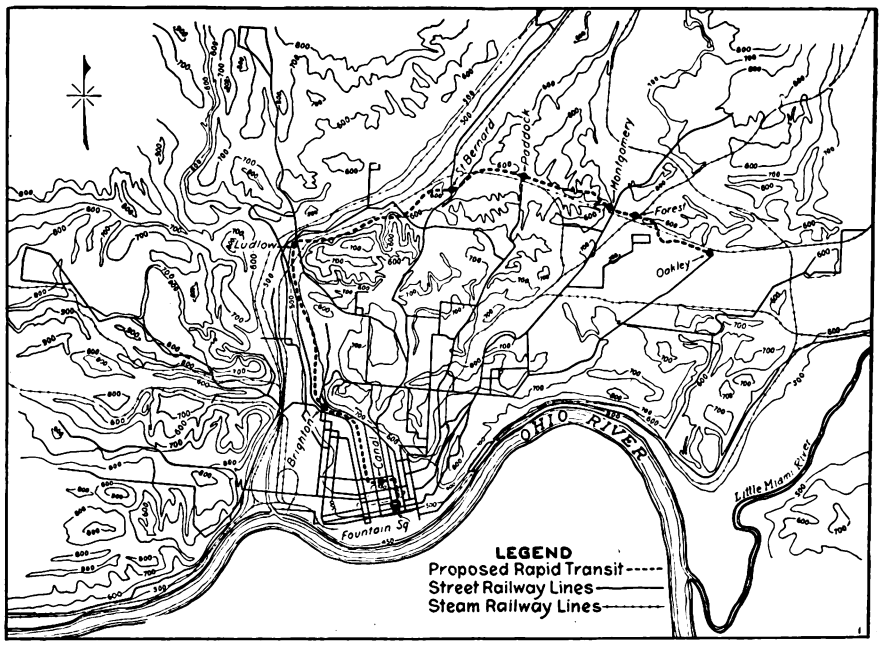
ness, so that the construction of the rapid transit line is not justified from an interurban standpoint. As the rugged topography of Cincinnati imposes unusual difficulties on its transportation facilities, the easy grades of the partially completed rapid transit line appeared to present a possible solution to real rapid transit service within and adjacent to the city. If such service can be provided at a cost that will warrant its undertaking it will benefit a large area of rapidly growing territory and at the same time enable the city to receive benefit from the large investment already made.

The purpose of the present report is to set forth the results of an investigation of the rapid transit situation made for the purpose of determining if the project (a) should be abandoned; (b) should be equipped and operated as it now exists; (c) should be completed and operated in accordance with any existing plan, or (d) should be completed and operated in accordance with other plans. If the line is to be completed and operated a feasible plan is needed, stating (a) whether or not the line should be operated independently or co-ordinated with other necessary transportation agencies; (b) what changes should be made in existing transportation facilities as the result of operating the rapid transit line, and (c) the financial results of operation of the rapid transit line.



Topographical map of Cincinnati and vicinity

Topography of City an Important Factor

Cincinnati grew up as a river town and in the days of its early great expansion all of its commercial and industrial life depended on the river. The topography of the city is important. In Cincinnati there are more hills and valleys than in any other city in the Union. It is the hilltops that have given the city suburbs unequaled for variety and beauty. These hills and valleys are a problem to industry. The level plain on which the old city was built has long been well filled. It is inevitable that Cincinnati should look for its future expansion to far-flung industrial districts with distances from Fountain Square that might be called metropolitan.

The business section, known as the Basin, is located on a plateau about 2 square miles in area, bounded by the Ohio River on the south and surrounded by bluffs from 200 to 300 ft. high on the other sides. Most of its residential population lives on these bluffs, so that the transportation problem largely becomes one of carrying people up and down the heights. The situation is shown on the topographical map. There are only three level approaches to the Basin district, two along the river, east and west respectively, and a third along Mill Creek, which follows a semi-circular path in getting into the Basin. All three approaches are narrow and are utilized to capacity by steam railroads, highways and street car lines.

About a Half Million People in District

About 410,000 people reside within the corporate limits of Cincinnati. The local transportation agencies, however, serve some 460,000 people in Ohio. The city of Norwood, with 30,000 people, is almost surrounded by Cincinnati, while the municipalities of St. Bernard and Beechwood Place, with an aggregate population of 11,000, are entirely within its corporate limits. The smaller contiguous municipalities served make up the Ohio total. In addition the territory across the river in Kentucky, including the cities of Covington and Newport, and the smaller adjacent communities, with an aggregate population of 125,000, increases the transportation requirements of Cincinnati, as about 70 per cent of the working population in that territory is employed in Cincinnati.

The increase in growth for various periods is shown in the chart on page 546. The curve for Hamilton County gives a more nearly correct picture of conditions. The curve for Cincinnati is affected by annexations. The city had its greatest growth between 1840 and 1850, increasing 150 per cent.

Local transportation on the Ohio side is cared for by the Cincinnati Street Railway, independently operated buses and the private automobile; local traffic handled by the steam railroads is almost negligible. The fare on the street cars is 10 cents cash or three tickets for 25 cents. The minimum fare on all buses is 10 cents, and this is increased by 5-cent steps on some of the longer routes.

The trend of passenger traffic is shown by the chart on page 546. The number of revenue passengers increased at quite a definite rate until about 1913. From then until 1920 the number of passengers continued to increase, but at a lower and more irregular rate. Since 1920 the curve has been very irregular and quite decidedly downward. This can be attributed to at least three factors—increases in the rate of fare, increases in the number of automobiles, and more recently to independent bus competition. Independent buses commenced operating in large numbers in 1925, but the number of passengers carried in that year is not shown because no data are available.

For the last few years the company was losing patronage up to Nov. 1, 1925, when under a change in operations and a new franchise a reduced fare went into effect, resulting in an immediate upward trend in passengers carried. Since it engaged in the operation of

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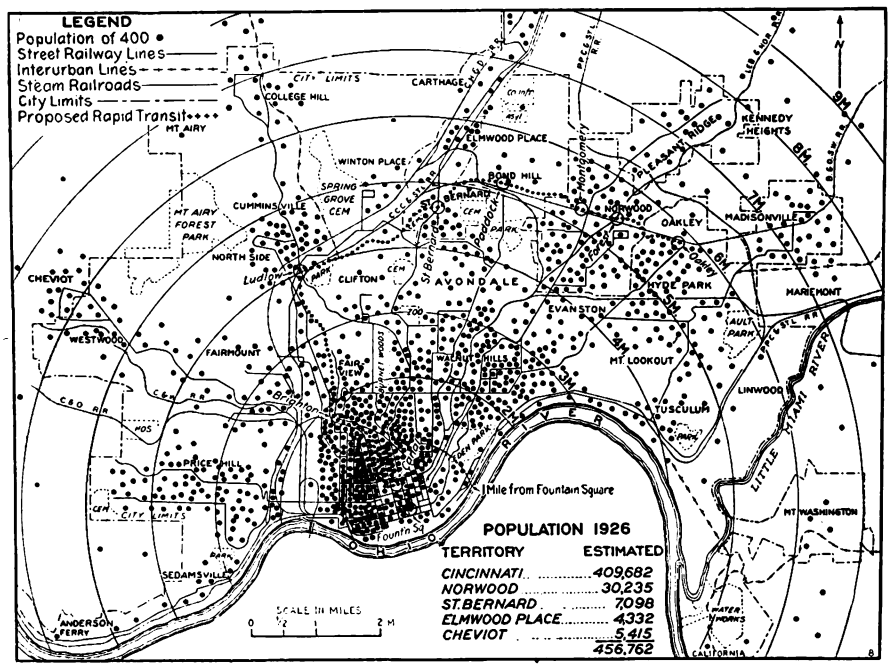

Distribution of population, Cincinnati and vicinity

buses early in 1926 the rate of increase has been accelrated, but unfortunately bus operation is increasing its total operating cost faster than its total revenue.

Besides the railway company's buses there are sixteen independent bus routes owned by five different companies and operating approximately 90 buses in local service. These buses are operating about 5,311,000 bus-miles and carrying some 13,300,000 local passengers annually. No information is available as to the financial results of their operation. In addition to these, 23 interurban bus lines have their terminal in Government Square, but do no local business within the city limits. It is questionable if any of these can be routed to the rapid transit line without lowering the quality of their service, as passengers, especially those with baggage, object to a transfer en route. It may be, however, that the rapid transit line may furnish a valid reason for terminating some of these interurban bus lines, especially the shorter ones, at its stations, thus removing just that much more traffic from the downtown streets and giving the rapid transit lines more business without impairing the service, because while a transfer will be required from bus to subway it will give a quicker ride.

Automobile an Important Factor

The private automobile is a factor in the local transportation situation which merits serious consideration. In the last five years the number of automobiles has increased 111 per cent in the state and 126 per cent in Hamilton County. There are now 88,000 passenger automobiles registered in the county. Checks in other cities have shown that about 15 per cent of the registered automobiles enter and leave the downtown section of the city daily. On this basis the automobiles of Hamilton County would carry some 16,000,000 riders in and out of the Basin annually. This makes no allowance for automobile rides which do not enter the Basin or for passengers carried on trucks. With these figures in mind it is not difficult to understand that the automobile has a serious effect on public transportation agencies.

Generally speaking, daily movement of the people originates and terminates at their residences, though of course other movements are made between the time they leave home and return. No census or even estimate of population by districts had been made since 1920. It was considered most desirable to obtain population figures for 1926, because while there has been no rapid growth in the total population of Cincinnati and vicinity, quite appreciable differences have taken place in the distribution of the population. Several methods were considered for bringing the 1920 census figures up to date, but the only two that were found sufficiently helpful to warrant their use were extensions of the 1920 census and a study of the report of the city planning commission, which established factors between total population and elementary school enrollment for each school district. As a result of these studies, the estimated population was derived as follows: Cincinnati, 409,682; Norwood, 30,235; St. Bernard, 7,098; Elmwood Place, 4,332, and Cheviot, 5,415, making a total of 456,762 in the territory. There is a further population of about 23,000 in the various other communities immediately surrounding the city and about 112,000 in the Kentucky territory immediately tributary to Cincinnati, making a total of approximately 600,000 people who may be considered as living in and immediately adjacent to Cincinnati.

On account of rapid changes in conditions, the riding on the public transportation lines was determined for the months of September and October, 1926, rather than an average for the year. It was found that the cars of the Cincinnati Street Railway carried on an average 7,600,000 passengers per month and the railway buses 583,000 passengers, or 98,200,000 passengers carried annually by the street car and bus lines of the company. It was estimated that the independent buses carry about 13,300,000 local passengers annually, making a grand total of 111,500,000 revenue passengers to be moved annually by the local transportation agencies in the Cincinnati district. It was also estimated that 4,400,000 annual rides were taken on the Cincinnati lines by persons residing in Kentucky.

Deducting from 111,500,000, the total rides in city service, the 4,400,000 rides originating in Kentucky and the 3,792,000 originating in other outlying sections, 103,308,000 rides remain as the number originating from the 462,000 people accounted for in the area studied. Dividing the number of rides by the population results in a figure of 224 as the average number of rides per capita. Dividing 111,500,000, the total annual rides, by 224, indicates that the local transportation lines are serving the equivalent of a population of 515,000. Further calculation was made to obtain the riding by districts.

Buses on Central Parkway No Solution

Calculations were made as to the number of riders that buses operating on Central Parkway would serve and save time as compared with present facilities. The time saving to the sections in the eastern portion of the city as compared with the present more direct routes downtown would be practically negligible or negative. Under ordinary circumstances it was estimated that the

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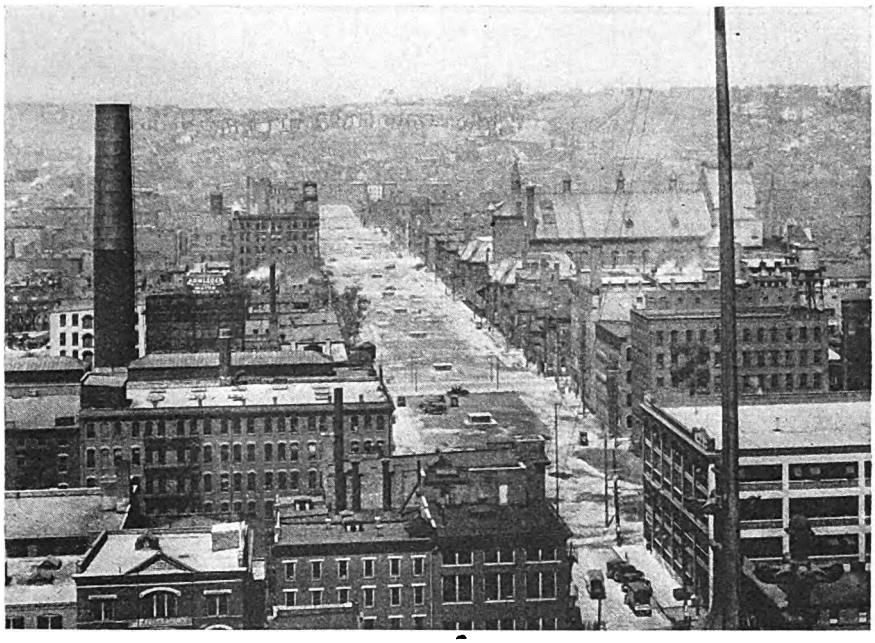
running time of buses operating between Knowlton's Corner and Fountain Square by the Parkway would be 21 minutes each way. This compares with 28 minutes required at present by street car, 25 minutes by bus and 12 minutes on the proposed rapid transit line. The run between Fountain Square and Knowlton's Corner represents the maximum saving in time possible by buses operating on the Parkway. On the assumption that all riders who could save time would use buses instead of street cars and that the public would be satisfied with bus service instead of street car service in this territory, it was estimated that 16,200 people would use buses daily between Knowlton's Corner and Brighton and 10,200 more between Brighton and the Basin, making a total of 26,000 daily or 8,972,000 rides annually. This estimate is based on the supposition that all the riders now using the car lines beyond Brighton would be carried on the buses that would operate over the Parkway. Buses at the rate of 78 per hour north of Brighton and 138 per hour south of Brighton would be required to transport these riders during the peak load periods. As in the case of the rapid transit lines, these buses to serve the riders properly must operate to some point in the vicinity of Fountain or Government Squares. The addition of 138 buses per hour in each direction to the present downtown rush-hour traffic would of course be a backward step in minimizing traffic problems.



Looking north along Central Parkway, prior to completion of automobile roadway

It will be seen from comparing present street car schedules with those of the proposed bus and rapid transit lines that buses will reduce the running time to Knowlton's Corner 25 per cent, while the rapid transit line will reduce it 58 per cent. From a standpoint of time saving alone buses will benefit approximately 9,000,000 riders annually, while the rapid transit will benefit more than four times that number. A rapid transit car with a carrying capacity several times that of the bus can be operated at a cost not to exceed that of the bus. The rapid transit is underground in the congested district and on its own right-of-way elsewhere, so that its operation improves traffic conditions by removing all of this traffic from the street surface, while the bus does exactly the opposite. The engineers could not, therefore, find any ground upon which to base further consideration of the use of buses on the Parkway as a substitute for the rapid transit line.

Stops Should Be Minimized

The primary purposes of rapid transit are to save time, reduce street congestion and increase the metropolitan area of the modern city in order that its citizens may live in more healthful and inviting localities than alongside their work. In Cincinnati the problem is threefold: (a) To get the people in and out of the Basin; (b) to distribute them quickly to various communities necessarily quite widely separated because of topographic conditions, and (c) to enlarge the area available for industrial and residential development.

Speed, regularity and frequency combined are essential to the success of rapid transit in Cincinnati. Only in this way can patronage be attracted to the line and thus reduce the number who desire to enter the congested section on the surface by public or private conveyance.

Factors influencing the speed and regularity of a rapid transit line are the grade and alignment of the route, power conditions, motor equipment, length of stop and number of stops. The last is by far the most important. The effect of adding a station, which of course involves an additional stop, on the rapid transit line is such a serious matter that it is well worth while to consider what it means, for it looms large not only in the dollars and cents cost, but in destroying the very thing that rapid transit is designed to accomplish—speed. The effect of a stop depends on so many variable factors such as the number of trains, the number of cars in the train, cost of station operation and cost of the station itself. For the type of service proposed for Cincinnati the cost of operating the rapid transit system would be increased $35,000 to $40,000 per year for each added station. Besides this it delays every person using the service other than those using that particular station about 1½ minutes on each ride. This means that each station stop adds about three minutes to the scheduled running time of each trip. With a three-minute space between trains an added train must be placed in service for each stop.

Obviously there is little question but that the greater portion of the existing line that is graded can judiciously be made a part of any rapid transit line recommended because service can be operated much cheaper on a rapid transit line than on a surface line if the cost of providing the rapid transit right-of-way is disregarded, which may be done in this case since the investment is already made and if not utilized will be a total loss. The problem in Cincinnati then becomes one of determining whether at a cost that will not be prohibitive additions or changes can be made in connection with the existing line to make it possible for it to function so as to provide the city with a practical rapid transit service.

Several plans for a belt line, utilizing the existing rapid transit line with a return through Duck Creek valley, were investigated. On account of the relatively small population that would be served none of these plans was approved.

It is recommended that the line be extended from

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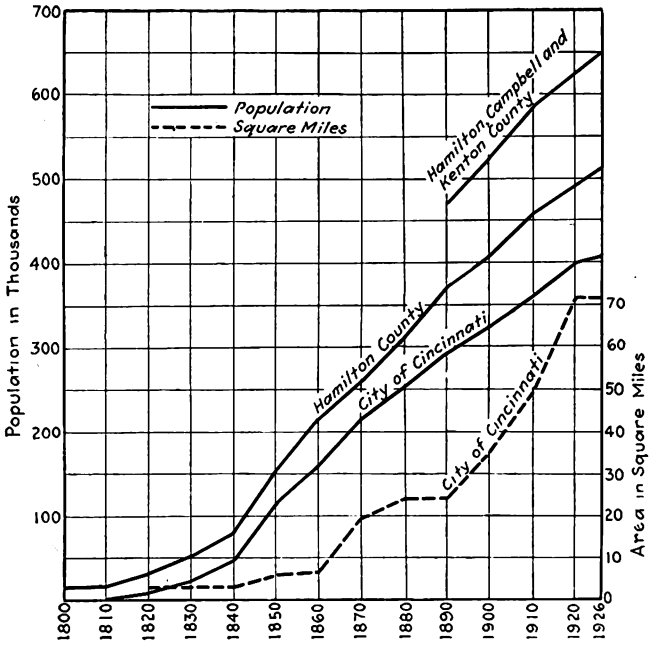


Population Cincinnati and vicinity, 1800-1926

its present terminal to Madison Road, Oakley, as it will increase the territory served by a material amount at a relatively low cost. The reservation is made, however, that this will hold only if no more stations are permitted than those specified in the report, as otherwise the time saving to Oakley would not be sufficient to warrant the extension and operation of the line.

Extensions Will Enhance Existing Lines

It also is the opinion of the engineers and others that the possibility of its successful operation is contingent on extending the line from Central Parkway and Walnut Street to some point in the vicinity of Fountain Square, which would better serve 47 per cent of the people who would use rapid transit. A rough estimate indicates that about 40 per cent of the line's total patronage would be contingent on its extension to Fountain Square.

An investigation was made to determine whether the route of the rapid transit line as already built is the most satisfactory or if changes could be made to advantage. Particular attention was given to the location of the Ludlow station. The line follows the old canal running east of Mill Creek and the B. & O. Railroad in the vicinity. The existing station is located at the south end of the Ludlow Street viaduct. This is at the end of the Central Parkway and automobile traffic will be heavy over the viaduct to Knowlton's Corner, as the Parkway will become the main artery between downtown and that part of the city lying to the north of the point where the Parkway will intersect Ludlow Avenue. To have the surface cars and motor buses that should feed into the rapid transit line cross the viaduct would add materially to the congestion and it would be much relieved by having them reach the rapid transit line at Knowlton's Corner.

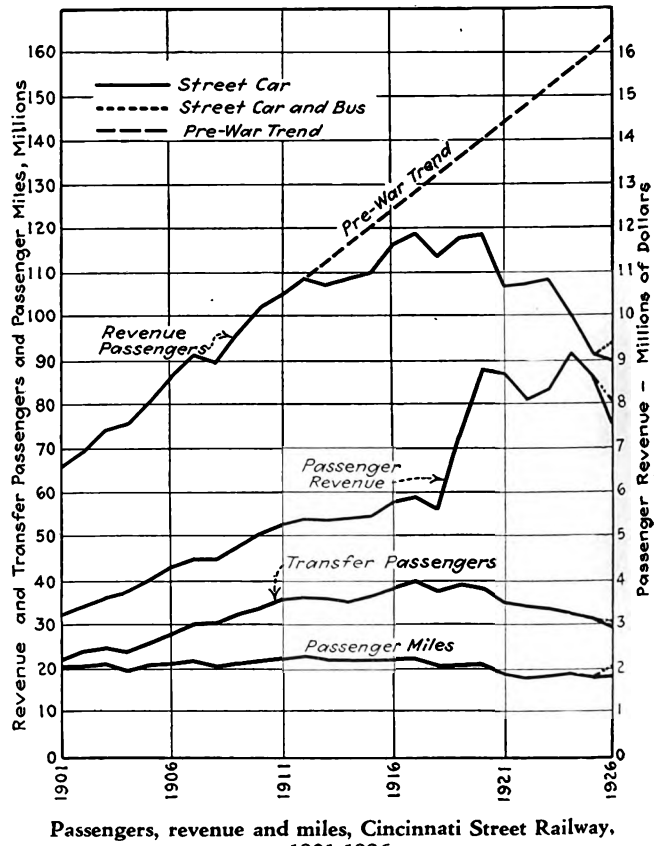
It was estimated that with the station located as at present some 2,356,000 people will enter and leave it annually, while if it is relocated as proposed the number would be increased to 4,036,000. In the former case practically all would have to be transported, as 1,600 ft. is farther than people will walk, especially if car service is available. It would require five or six minutes time to walk to the station and from two to three minutes to ride to it from Knowlton's Corner. In the new location the additional 1,080,000 rides which would originate at the rapid transit station if located at Knowlton's Corner would continue to use the surface cars if the station is not relocated. It is estimated that the line can be relocated at a cost of $716,000, the amount covering the cost of construction of the line and station, acquiring the right-of-way, and any incidental damages involved. The loss of investment in the present right-of-way and station probably does not exceed $150,000.

Studies were also made of the locations of several of the other stations along the line. Those at Liberty Street, Marshall Street and Clifton Street were found unnecessary and their abandonment was recommended. It was also recommended that all stations yet to be constructed be built with island platforms, with a mezzanine floor above. This will allow one attendant to sell tickets or make change for trains in either direction.

Prepayment areas into which surface cars and buses can be run for transfer of passengers to the rapid transit line without the use of paper identification tickets are recommended at Brighton, Ludlow, St. Bernard, Montgomery and Oakley stations. The plan proposed is similar to that used by the Boston Elevated Railway at various points.

Interurban to Serve Suburb

The Cincinnati, Hamilton & Dayton Railway, which passes through the College Hill territory and terminates at Spring Grove Avenue, is the only remaining interurban in a position to benefit by utilizing the rapid transit line as an entrance to downtown Cincinnati. With suitable equipment its cars could operate over the proposed rapid transit line directly to Fountain Square. Both the interurban and the Cincinnati Street Railway use the same street through the center of the College Hill territory. If the interurban were to run through and would give



Passengers, revenue and miles, Cincinnati Street Railway, 1901-1926

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local bus service in College Hill to enable the residents to reach the car line it would serve the territory much better than the Cincinnati Street Railway.

There are some 3,003,609 annual riders in this territory, of whom 1,620,600 are carried by the street railway and the remainder are divided between the C., H. & D., the steam railroads and the interurban buses. Assuming that the rapid transit line is completed by 1930 it is estimated that the traffic will increase to 6,655,310 riders by 1940 and 8,434,011 by 1905. The running time between Fountain Square and College Hill, now 42 minutes by street car, would be 26 minutes. The time from Fountain Square to the railroad station and thence to Hamilton by the fastest steam railroad train is 66 minutes and by bus 75 minutes; the new time on the interurban will be 55 minutes. Other points will be affected accordingly.

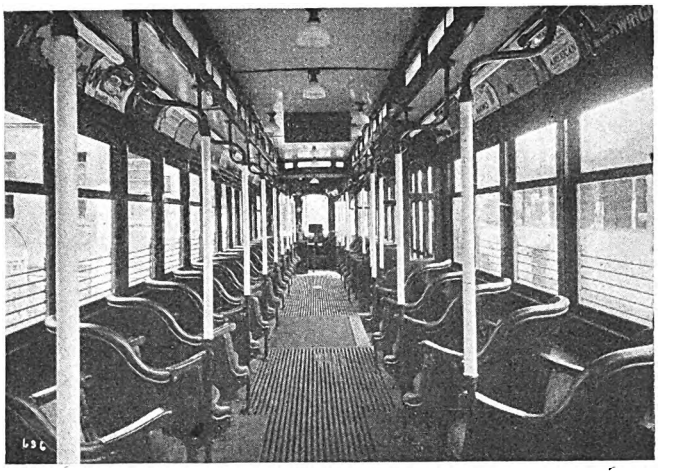
By making this arrangement the total undeveloped land area which could be reached within a total time of 60 minutes would be increased from 2,313 to 10,405 acres.

Should the interurban be accorded the right to operate to Fountain Square via the rapid transit line it should agree substantially to (a) pay a rental based on the miles operated; (b) provide the type of equipment necessary to conform with that operated on the rapid transit line; (c) connect its line at Spring Grove Avenue with the rapid transit line by means of a viaduct extending over Mill Creek, eliminating the grade crossings of Spring Grove Avenue and the B. & O. Railroad.

Pittsburgh Introduces a New Chair Car Service

INDIVIDUAL bucket-type seats have been used by the Pittsburgh Railways in the equipment of one of its latest type low-floor, one-man, two-man cars. These seats have spring cushions and cane covered backs with leather binding around the top. The rear side of the seat back is covered with sheet steel to prevent the cutting and marring that frequently happens with cane covering.

Arrangement of the seats is unique in that they are in a single row along each side of the car. Each seat



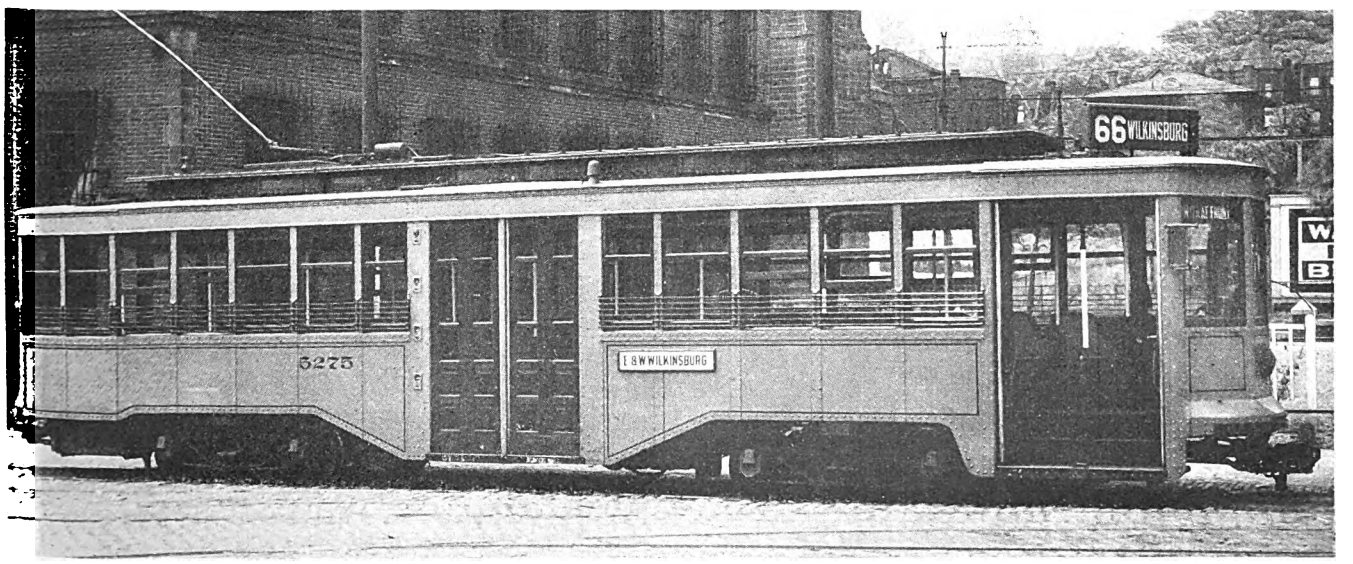
A rear view showing the seating arrangement of the chair car, the stanchions and the one-level floor

is placed at an angle of 45 deg. with the side of the car, thus forming the "saw tooth" line-up as may be seen in one of the illustrations. This gives the desirable effect of privacy to each seat which could not be so well obtained in any other way without the sacrifice of considerable space.

Access to these seats is free at all times for the reason that one does not interfere with the one next to it. Patrons may be seated quickly and may reach the doors easily when leaving since each seat faces the aisle.

An additional convenience and safeguard is provided in the porcelain enamel stanchions which are placed beside each alternate chair throughout the full length of the car. The stanchions on one side of the aisle are staggered with respect to those on the opposite side, thus providing one upright for each seat space along the aisle. These stanchions, together with the longitudinal hand rod above the seats, replace the porcelain enamel hand straps which are standard equipment on this series of cars.

Another feature which is being tried out in this unit is the straight floor line throughout the car. Up to the present time the standard arrangement for low floor cars with center doors has consisted of a low floor at the center doors with a ramp leading to the front and rear sections of the car. This particular car has that part



The chair car ready for service. Note the low floor of the car

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of the floor raised to the same elevation as the rest of the floor. This necessitates an additional step at the center doors but does not appear to have any appreciable effect in slowing up loading. In the remodeled car, which is now arranged for one-man operation only, the center doors with the additional step could have practically no effect because these doors are used only at heavy loading and unloading points in the city loop, which is only a small fraction of the number of stops the car would make in a trip.

There is no doubt that the appearance of the car in the interior is improved by this new floor arrangement. There is, however, a distinct advantage in this arrangement to passengers who are walking in the aisle when the car is in motion. It is not nearly so difficult to keep one's balance on the straight floor as it is on a sloping one. This type of floor, together with the many stanchions, thus makes it safe for many women patrons who would otherwise not risk their footing in a moving car. A package shelf is another convenience afforded in this unit. This has been placed between the seats and the sides of the car.

Provision has been made for a bulletin board which extends from the ceiling in the center of the car. On this board is carried a notice asking for comments on the seating arrangements of the car. The notice has brought to the commercial department many comments of praise and congratulations on the agreeable type of service this car is providing. Some automobile riders have expressed their complete satisfaction with the unit as a substitute for their own private cars for trips to the city. In fact, all who ride the car appear to be favorably impressed by it.

The car has been operated from the Craft Avenue carhouse on several routes where one-man units are in service. It will later be tried on several other lines of the system which are operated through the better residential districts and where automobile competition is very noticeable. The results of these trial runs will have a distinct bearing upon the future of this type of service in Pittsburgh. If it is found that off-peak traffic can be sufficiently increased by this service, it is very probable that one or more chair cars of this type will be built.

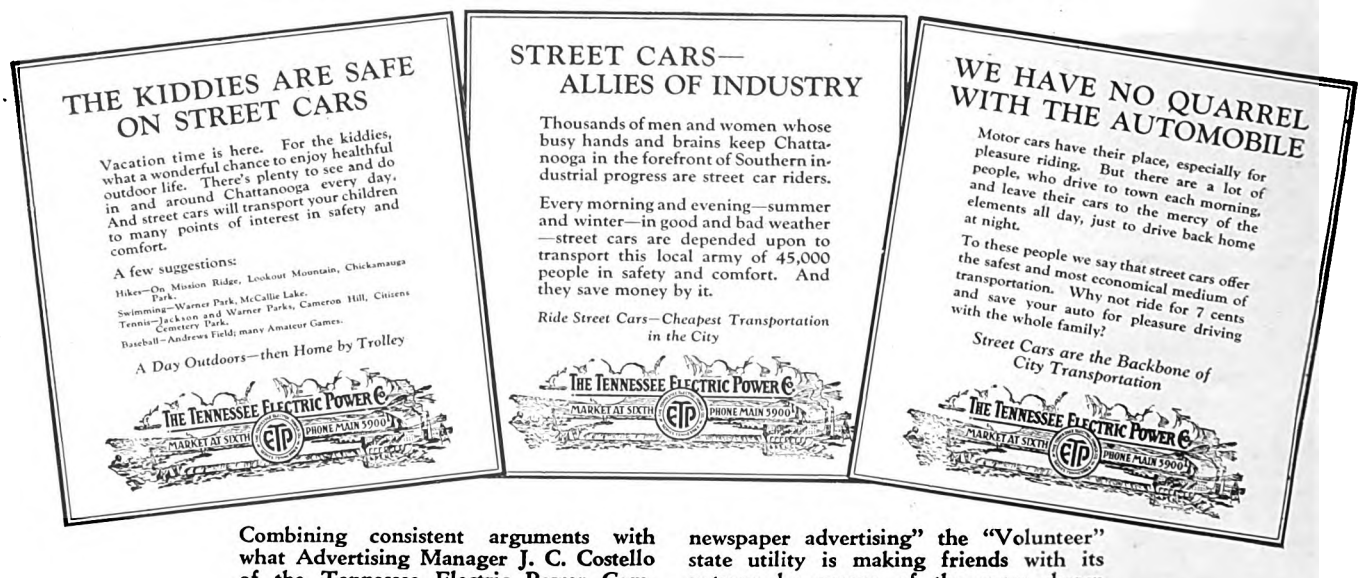
London Railway Headquarters to Cost $1,665,000

Head office building to be erected by the Underground Electric Railways Company of London

CONTRACT for the construction of the large new building to be erected upon the triangular site of the London transport combine at Westminster, London, to serve as the headquarters of the London underground railways, the London General Omnibus Company and associated companies, has been placed with a London concern on a tender of £333,000 ($1,665,000). The building will require 4,500 tons of stone and 2,500 tons of steel for the frame of the structure. It will have ten stories and a tower and will be 173 ft. high.

The building is scheduled for completion at the end of 1928.

Tennessee Electric "Saying It" with Newspapers



Combining consistent arguments with what Advertising Manager J. C. Costello of the Tennessee Electric Power Company, Chattanooga, declares "inexpensive newspaper advertising" the "Volunteer" state utility is making friends with its patrons by means of the copy shown above

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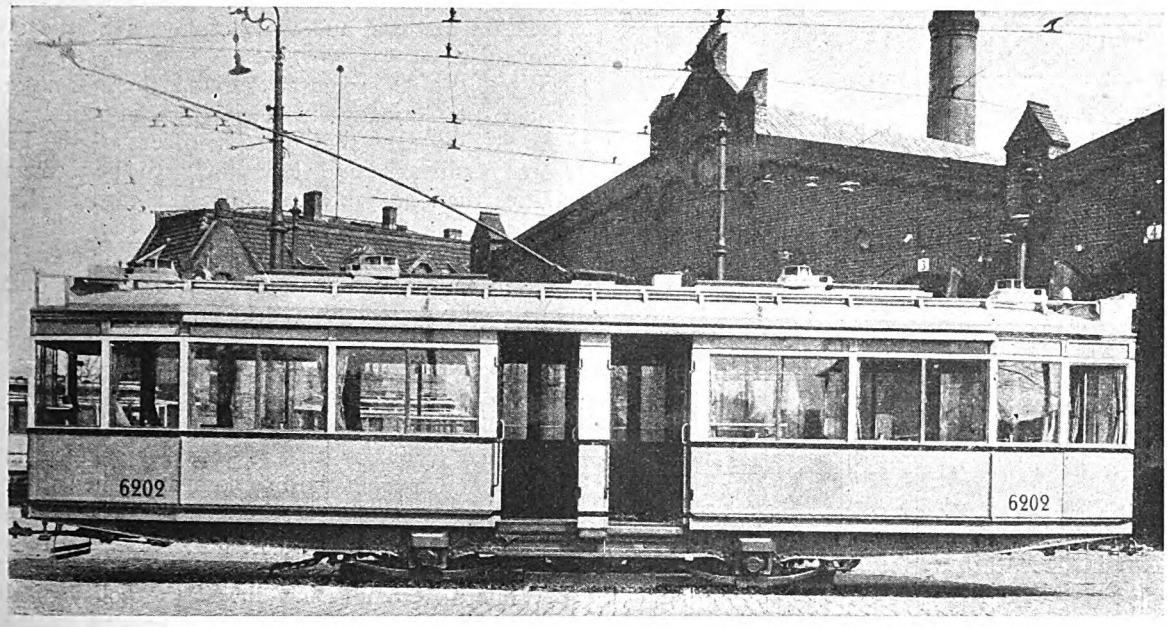

Berlin's latest surface motor car has two center doors and is fitted with Cardan drive. This method of operation is still under trial in Berlin

Berlin Practices Co-ordination in Transportation

Policies of rapid transit, bus and surface car line directed by a single commission. Traffic is constantly growing. Operating problems differ somewhat from those in America's largest cities

By Henry W. Blake
Senior Editor *Electric Railway Journal*

BERLIN is one of the very few large cities in the world in which the bus service, rapid transit lines and street railways are under one management. This is not true of London, where the buses and rapid transit lines are under one control and the principal street railway lines under another, nor is it true of Paris, or of New York or Chicago. In Philadelphia all of these services are under a single management, but free transfers are not given between all of them. Boston also has them under one management, but Boston is much smaller in number of inhabitants than Berlin.

The Berlin situation was brought about by the outright ownership by the city of one of these properties and a purchase by it of a majority of the stock of the other two, following the close of the war.

The city owns the entire surface line system, having taken it over during the inflation period for 20,000,000 gold marks (about $5,000,000). As a conservative estimate of the value of the property before the war was 300,000,000 marks, it will be seen that the city acquired the property for only a small proportion of its real value.

In each of the other transportation agencies the city has a majority stock interest. The elevated and underground system was organized in 1897, largely by the Siemens & Halske Company and the Deutsche Bank, and began service in 1902. It continued under private direction until 1926, when control was taken over by the city. Under this arrangement the company, which is known as the Hochbahngesellschaft, first absorbed two other rapid transit systems in Berlin, which had been built later and physically were really extensions of its own lines but had been financed independently. These properties were taken over by the exchange of their stock for stock of the Hochbahngesellschaft. Then the city purchased 69,755,000 marks par value of the Hochbahngesellschaft stock, paying therefor in 7 per cent interest-bearing certificates, leaving only 8,517,000 marks of Hochbahngesellschaft stock outsanding.

Of the capital stock of the bus operating company, the Allgemeine Berliner Omnibus Aktien Gesellschaft, the city owns about 8,000,000 marks, leaving only about 2,000,000 marks floating.

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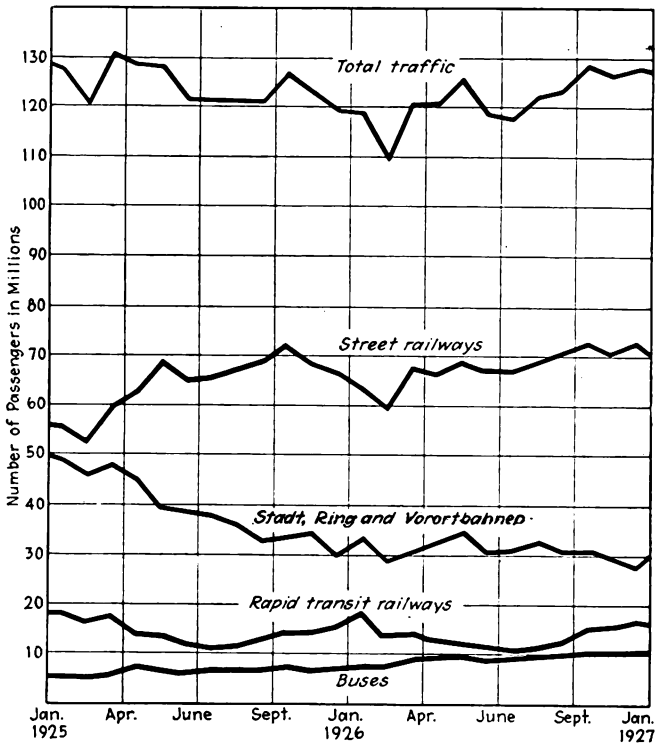


Monthly division of traffic between different agencies in Berlin

It has been the policy of the city to continue to operate these systems by private companies with separate officials for each, but to secure unity of policy and co-ordination of service through a single directing commission.

A governing reason for the retention of operation by stock companies was that the original owning corporations had outstanding obligations in regard to bond retirements and other matters which could be fulfilled better by a private company than by the city. Practically, also, there is no doubt that the retention of the company form of operation tends to remove the direction of the companies farther from politics than otherwise it might be.

TABLE I—PASSENGERS CARRIED (IN MILLIONS) 1911–1926 ON THE VARIOUS SYSTEMS IN GREATER BERLIN

	Surface Lines		Stadtbahn System		Bus Lines		Rapid Transit Lines	
Year	Number of Passengers	Per Cent of Total	Number of Passengers	Per Cent of Total	Number of Passengers	Per Cent of Total	Number of Passengers	Per Cent of Total
1911	606	50.6	370	31.0	154	13.0	64	5.4
1912	638	51.1	388	31.1	159	12.7	64	5.1
1913	652	52.7	341	27.5	170	13.9	73	5.9
1914	607	49.6	383	31.3	156	12.7	79	6.4
1915	619	53.5	366	31.6	101	8.7	72	6.2
1916	716	57.7	370	29.8	.74	6.0	81	6.5
1917	897	66.3	311	23.0	33	2.4	112	8.3
1918	1,056	69.2	344	22.6	8	0.5	117	7.7
1919	1,008	66.8	376	24.9	11	0.7	115	7.6
1920	784	55.3	528	37.2	6	0.4	101	7.1
1921	672	49.8	559	41.5	21	1.6	96	7.1
1922	520	38.1	693	50.7	33	2.4	120	8.8
1923	286	25.5	643	57.5	23	2.1	167	14.9
1924	530	42.9	474	38.3	48	4.0	183	14.8
1925	772	53.6	442	29.3	74	5.1	172	12.0
1926	813	55.8	371	25.5	113	7.5	163	11.2

Governing Commission of Sixteen Members

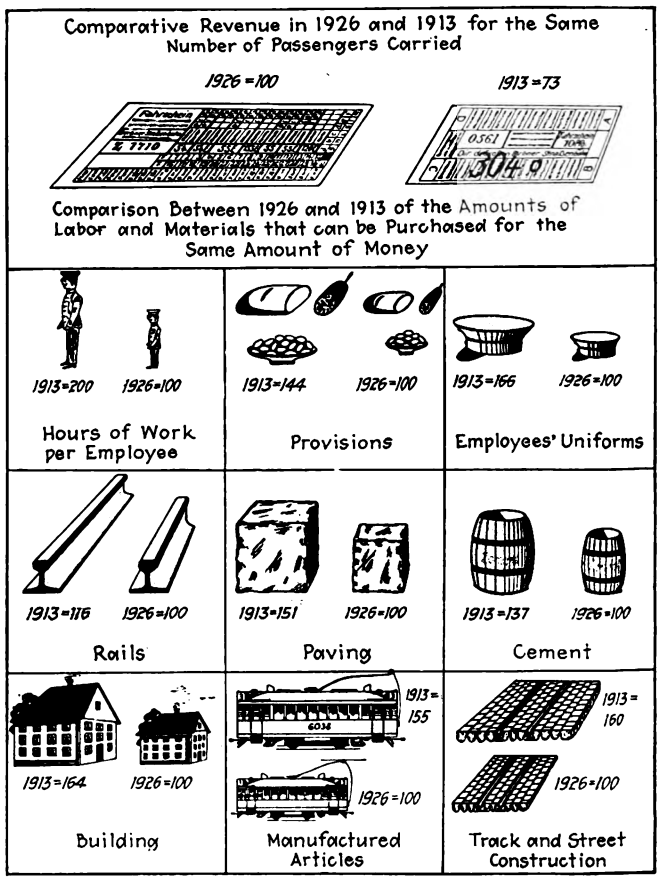
The single governing commission for the three operating companies consists of sixteen members, made up of eight members of the Board of Aldermen, four representatives of the city administration, two distinguished citizens, who are selected for their knowledge of transportation matters, and two employees of the operating companies.

While the Aldermen are elected, there is not as much change in Germany in officials of this kind as in the United States, so that these members of the board are more permanent and less likely to be influenced by politics than probably would be the case in the United States. The four members of the city administration are the city councillor for traffic, its chief engineer, its adviser on traffic and its treasurer. These officers are appointed, not elected, and in practice have long terms.

The labor members vary with the topic considered by the board; that is to say, two representatives of the employees of the rapid transit lines sit with the board when the topic to be considered relates to the rapid transit lines, two from the surface lines for surface line questions and two from the bus company when the question at issue affects bus operation.

The Stadtbahn Also a Factor

While this commission directs the policy of the three companies mentioned, it does not control all the Berlin urban transportation agencies because of the existence of the Stadt- und Ringbahn, a standard-gage railroad extending around and across the city and with suburban extensions. This road is part of the German State Railroads system and was built some 50 years ago to form a physical connection for the steam railroads which enter Berlin from several sides. It also had certain military value in the mobilization of troops. Owing to its location, this road has always done considerable city and suburban passenger transportation business.



This chart was published by the Berlin Surface Lines to illustrate the comparative increase in the cost of material and labor used in street railway operation during the last thirteen years and the much smaller increase in the charge for transportation

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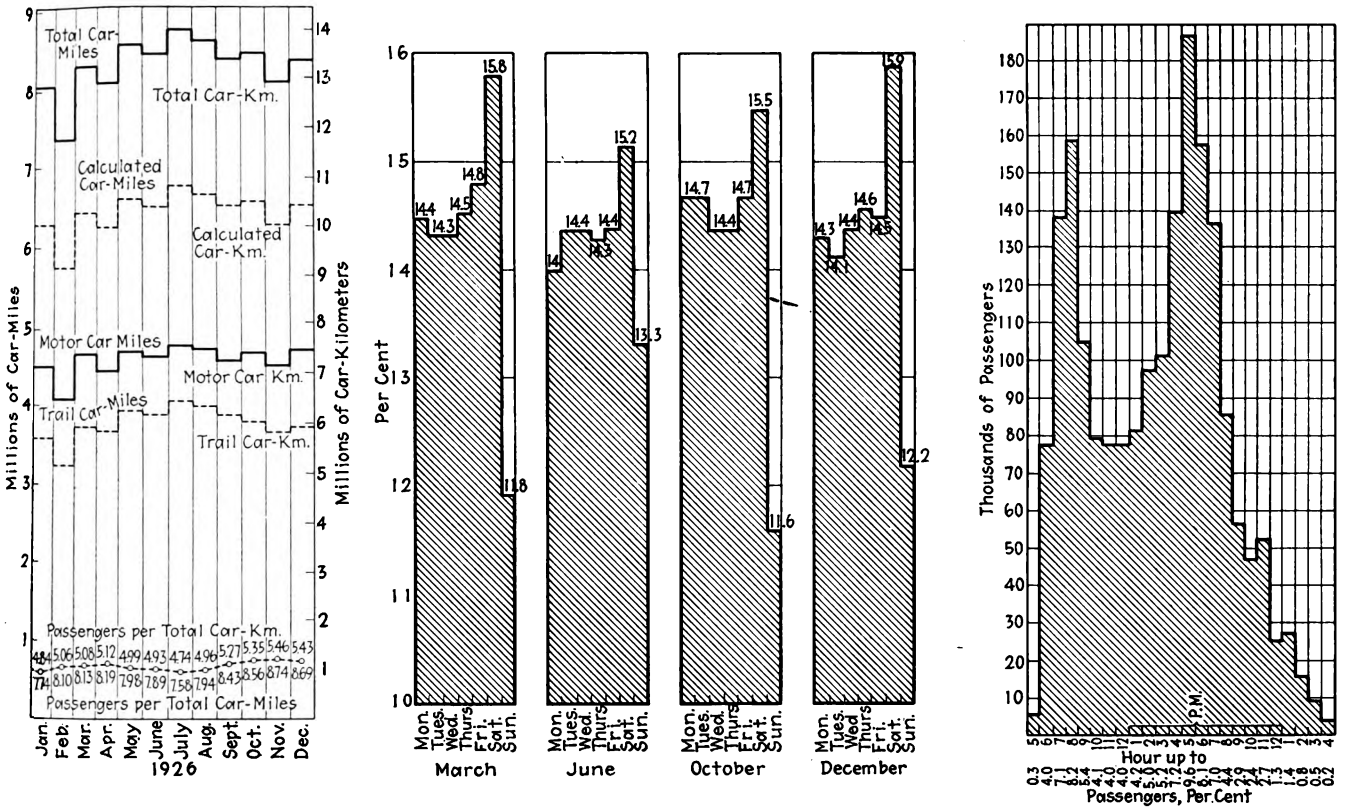

Monthly, weekly and hourly load charts for varying periods in 1926, Berlin Surface Lines

At left, monthly load chart of car-miles and car-kilometers, Berlin Surface Lines, for calendar year of 1926, also rides per car-mile and per car-kilometer. In center, weekly load chart in per cent of total, Berlin Surface Lines, for four typical months during 1926. At right, hourly load chart of passengers, Berlin Surface Lines, for Wednesday, Dec. 5, 1926.

Operation of this line has been by steam locomotives up to within recently, largely because the government railroad authorities could not decide whether it should be equipped with alternating or direct current. A decision was then reached to equip two of the four tracks with the third-rail direct-current system for urban service, the question of the arrangement to be adopted later when through single-phase trains enter the city to be determined when the through trunk lines entering Berlin are electrically equipped.

With its new direct-current equipment, this transportation system should play an even more important part in Berlin's city transportation than in the past, at least in number of passengers carried. Whether it will increase its proportion of total passengers remains to be seen, because the street railway, rapid transit and omnibus systems are also making important improvements at the present time.

How the Traffic Is Divided

The diagram on page 550 shows the division of traffic between the several agencies by quarters during 1925 and 1926, and Table I, the division by years from 1911 to 1926 inclusive. In the latter the fluctuations in recent years, particularly between the two principal transportation systems, will be noted. Thus, the street railway proportion, which was 69.2 per cent in 1918, fell to 25.5 per cent in 1923, but in 1926 had returned to 55.8 per cent.

Conversely, the Stadtbahn system, which carried only 22.6 per cent in 1918, was responsible for 57.5 per cent of the traffic in 1923. Its local traffic in 1926, amounting to 371,000,000 passengers, was about the same numerically as before the war and represented 25.5 per cent of the total. The period of its spurt, 1920-23 and extending into 1924, corresponds roughly to the time of great currency inflation in Germany, when the street railways under private ownership were trying to raise fares rapidly enough to meet their financial obligations, whereas the fares on the Stadtbahn, under government ownership, were less susceptible to the devaluation movement in the currency.

TABLE II—DEVELOPMENT OF GREATER BERLIN TRAFFIC SINCE 1890

Year	Inhabitants Within the Boundaries of the Present Greater Berlin	Total Passengers Carried	Yearly Rides per Inhabitant
1890	1,960,000	234,315,000	119
1891	2,022,000	253,669,000	125
1892	2,084,000	268,226,000	129
1893	2,146,000	290,161,000	136
1894	† 2,208,000	306,007,000	139
1895	2,270,000	340,299,000	150
1896	† 2,358,000	391,121,000	166
1897	† 2,447,000	400,732,000	164
1898	† 2,535,000	441,429,000	174
1899	† 2,624,000	496,926,000	189
1900	2,712,000	545,899,000	202
1901	† 2,815,000	536,818,000	208
1902	† 2,917,000	628,037,000	215
1903	† 3,020,000	687,244,000	228
1904	† 3,123,000	758,426,000	243
1905	3,225,000	834,245,000	259
1906	† 3,327,000	919,024,000	276
1907	† 3,429,000	969,500,000	283
1908	† 3,531,000	987,200,000	280
1909	† 3,633,000	1,048,156,000	289
1910	3,734,000	1,125,094,000	301
1911	3,794,000	1,193,781,000	315
1912	3,901,000	1,247,973,000	320
1913	3,944,000	1,289,966,000	327
1914	3,804,000	1,224,700,000	322
1915	3,722,000	1,158,000,000	311
1916	3,625,000	1,219,000,000	336
1917	3,606,000	1,352,000,000	375
1918	† 3,700,000	1,499,000,000	405
1919	3,804,000	1,512,000,000	397
1920	3,864,000	1,424,500,000	369
1921	3,893,000	1,349,000,000	347
1922	3,926,000	1,318,000,000	336
1923	3,938,000	1,198,000,000	304
1924	3,941,000	1,248,000,000	317
1925	4,038,000	1,445,000,000	358
1926	4,139,000	1,460,000,000	353

† Estimated. All other population figures are taken from official municipal publications.

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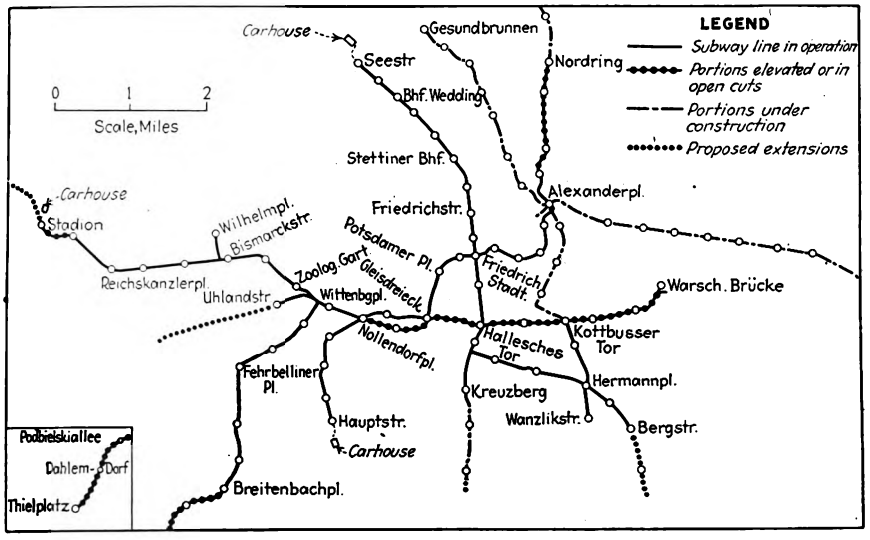


Map showing the rapid transit system in the city of Berlin, Germany

years of age who have secured an official certificate that their financial circumstances call for a reduction in fare. The hours and days on which these school tickets can be used are limited, as in the United States. The reduced rate is also available to crippled war veterans under certain circumstances. Several varieties of monthly passes are also sold by the Berlin Surface Lines and rapid transit system. A purchaser can buy such a pass, good for an unlimited number of rides during the month over one, two, three or all lines of either the surface or rapid transit system, or he can buy one pass good over both the surface and rapid transit lines.

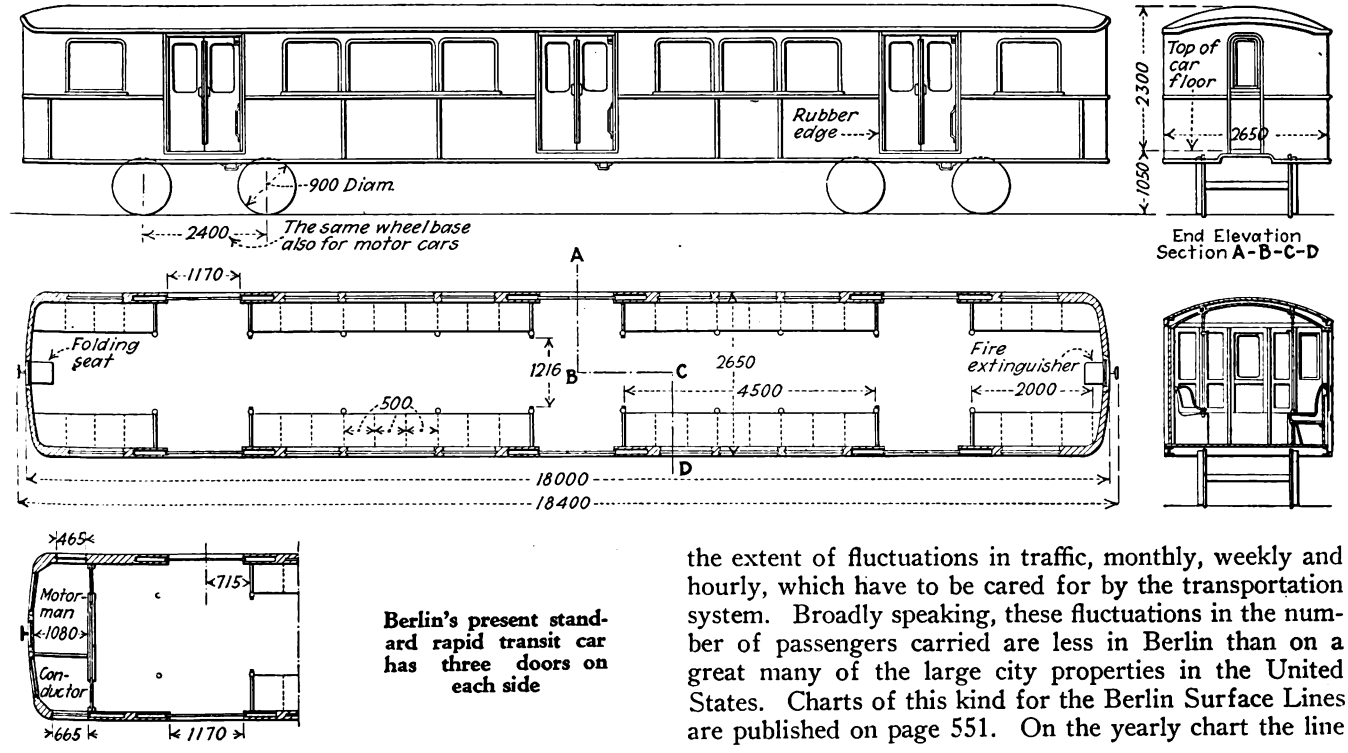
The universal transfer in force is limited to one change and also as to time. The initial trip must be taken within 1½ hours, including the time required to make the transfer. This period was selected after a consideration of the length of trips on individual lines and length of time required for transfer. However, by proper selection of lines a person can take a three-hour trip over a distance of 22½ miles for a single fare, but the trip must always be in the same general direction.

In this connection it should be remembered that many railway costs, particularly for labor, are much lower than in the United States. Statistics on labor costs in Berlin were published in an article by the writer in the issue of the JOURNAL for Aug. 27, 1927. Nevertheless, German railway costs of the present day are much higher than they were in 1913, although Germany has stabilized its currency. These increases in operating expenses have been effectively pictured in a chart issued by the Berliner Strassenbahn Betriebs Gesellschaft (the title of the street railway operating company). This chart is reproduced on page 550.

In a number of other respects the operating problems that have to be contended with in Berlin are less acute than those encountered in the larger cities of the United States. This is particularly true in the matter of street congestion, which is notably less severe, since with a population of about 4,000,000 there are only about 50,000 registered automobiles and parking regulations are enforced. On the other hand, there are many bicycles and motorcycles, commercial trucks and taxicabs on the public streets.

Table III gives for the city of Berlin the number of street accidents caused by these various types of vehicles during 1926, an accident being so classified when serious enough to become part of the police records. An attempt in this table has also been made to give an idea of the extent of use of the public streets by these various classes of motor vehicles. Obviously, this could not be done by the number of such vehicles registered. Instead, a count was made on Dec. 31, 1926, and the figures in the first column of Table III are based on this count.

Another factor of street railway operating expense is the extent of fluctuations in traffic, monthly, weekly and hourly, which have to be cared for by the transportation system. Broadly speaking, these fluctuations in the number of passengers carried are less in Berlin than on a great many of the large city properties in the United States. Charts of this kind for the Berlin Surface Lines are published on page 551. On the yearly chart the line



Berlin's present standard rapid transit car has three doors on each side

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"calculated car-miles" shows an arbitrary figure made up by adding to the motor-car-miles half of the trail-car-miles. This is considered in Europe a very convenient unit for measuring certain expenses, particularly labor expenses. A notable feature of this chart is the comparatively large number of passengers per car-mile, varying from 7.58 to 8.74. Another is the comparative evenness of the load line, though the demand for passenger transportation seems to be slightly greater in summer than in winter. The weekly curve line indicates that Saturday is the big day and Sunday the low day during all periods of the year. The hourly load chart, based on a count of passengers on Wednesday, Dec. 5, shows a good mid-day load, with the rather unusual feature of a broader afternoon peak than morning peak, due probably to the large number of Christmas shoppers. Generally on German street railway lines the morning peak is higher and narrower than that in the afternoon, due to the fact that the opening hours for business in different fields are closer together than the closing hours.

Equipment of Existing Lines

To care for this traffic the Berlin Surface Lines had, at the beginning of 1927, 1,920 motor passenger cars and 2,008 trail passenger cars, besides 244 service cars, 21 electric locomotives, 206 freight trail cars, 23 postal mail cars and other miscellaneous equipment. To operate its system it had 13,735 employees. Its latest type of motor car, using Cardan drive, is shown in the illustration on page 549 of this article. Full particulars of this and other types of the company's cars were given in two articles by Manager Pforr of the Berlin Surface Lines, appearing in Electric Railway Journal for Jan. 29 and Feb. 5 of this year.

The rolling stock equipment of the Elevated and Underground Road at the beginning of this year consisted of 427 motor cars and 390 trail cars. It had 50.4 km. (31.5 miles) of route and 127 km. (79.4 miles) of track. It has cars of two widths, because one of the later extensions, the Nordsüd line, was built with wider clearances than the original Hochbahn. Both properties now belong to the same company and all future lines will be built with clearances like the Nordsüd cars. A diagram on page 553 shows a plan and elevation of the trail car which has been adopted for all new equipment. The motor car is just like the trail car except that one end has compartments for the motorman and conductor. All dimensions are given in millimeters.

As will be seen this car has three doors on each side. The trail car has accommodations for 53 seated and 112 standing passengers and weighs empty 29.4 metric tons (64,680 lb.). The motor car has accommodations for 44 seated and 117 standing passengers and weighs, with equipment but without passengers, 40.6 metric tons (89,320 lb.). No ventilators are shown on the accompanying elevations, but the Flettner type will be used on all new cars. The older cars have low monitors. Other particulars of the equipment will be contained in a later article by the writer in Electric Railway Journal.

About one-fourth of the cars in each train are smokers and are painted red on the outside so as to be easily distinguishable by waiting passengers. The non-smokers have yellow as an outside body color. Divisions as to classes by fare have been given up within the last year and only one class of fare is now charged.

Before the war the underground conduit system was used by the surface cars in the center of Berlin. All cars were fitted with trolley poles, and those cars which passed through the center of the city had to have plow equipment also. During the war the company received permission to equip these sections with overhead wires as an emergency measure to reduce maintenance costs. After the war the overhead wires were allowed to remain. There is now no underground conduit operation in Berlin.

The standard train on the Nordsüd line has four cars, of which the two end cars are motor cars and the other two are trailers. This train is increased to one of six cars by the addition at one end of a motor car and trailer.

The cars on the Hochbahn proper are considerably smaller, on account of smaller clearances. They measure only 12.83 m. (42 ft. 1½ in.) long and 2.26 m. (7 ft. 5 in.) wide. The motor car accommodates 26 seated and 56 standing passengers and the trail car 33 seated and 55 standing passengers. Both have two doors on each side. The longest train which can be run on the Hochbahn at present consists of six cars, three motor cars and three trailers, but when the few remaining platforms are extended it will be possible to run trains of eight cars each.

The bus system in Berlin is operated by the Allgemeine Berliner Omnibus A. G., which on the first of this year had 490 buses, with 100 more on order. By far the greater number are double-deckers with solid tires.

Kansas City Company Tells New Car Story in New Way

In order to acquaint the public of Kansas City with its $1,500,000 remodeling and rehabilitating car program and at the same time to present graphically the improvements the Kansas City Public Service Company is using the advertising columns of the daily press, employing such copy as is shown elsewhere on this page.

Besides graphically pointing out the new features with numbered key paragraphs, the company, in a box in the righthand corner of each advertisement, is announcing this policy:

In line with our policy to give greater Kansas City an unexcelled urban transportation system, we will spend in the next twelve months approximately $1,500,000 to remodel and rehabilitate all of our 745 cars. These cars, to be turned out at the rate of twelve each week, will be equipped with all of the recently invented labor-saving devices, embodying some new features developed in Kansas City.

Forty-five of these de luxe cars, the first series to be completed, will be placed in service on the Country Club line early in July. Later they will be rotated on other lines. In addition to the new mechanical and air features, these 45 cars will be equipped with rubber tile flooring Kemi-suede seat covering, new lighting fixtures, sun visors and steel skirts which cover the trucks, minimize the noise and give the car a streamline effect.

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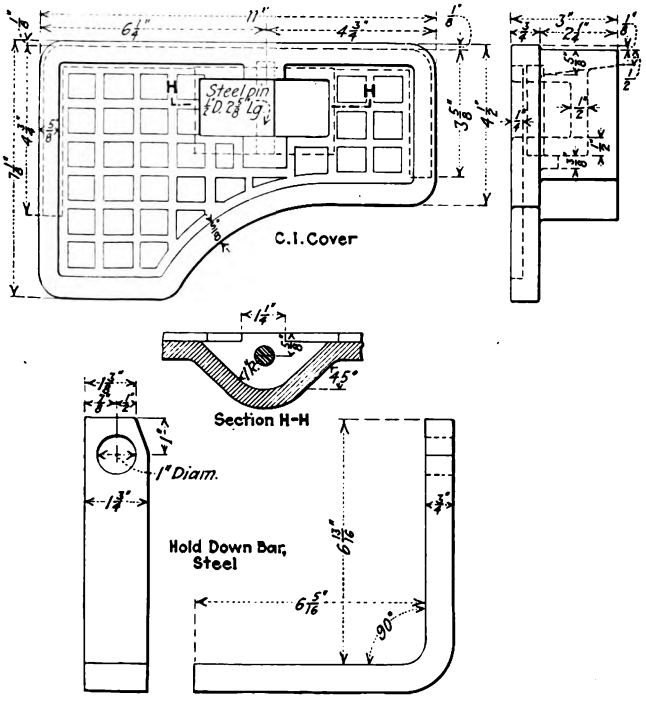
Standard Tongue Switch Designed

Study begun in 1924 by committee on way and structures has now been completed. Luncheon conference to be held at convention to discuss proposed design

FOR the past three years the committee on way and structures of the American Electric Railway Engineering Association, acting through a special committee, has been working out a design for a standard tongue switch. This work has now been completed and through the courtesy of one of the manufacturing companies two of the proposed switches will be on exhibition at the Cleveland convention.

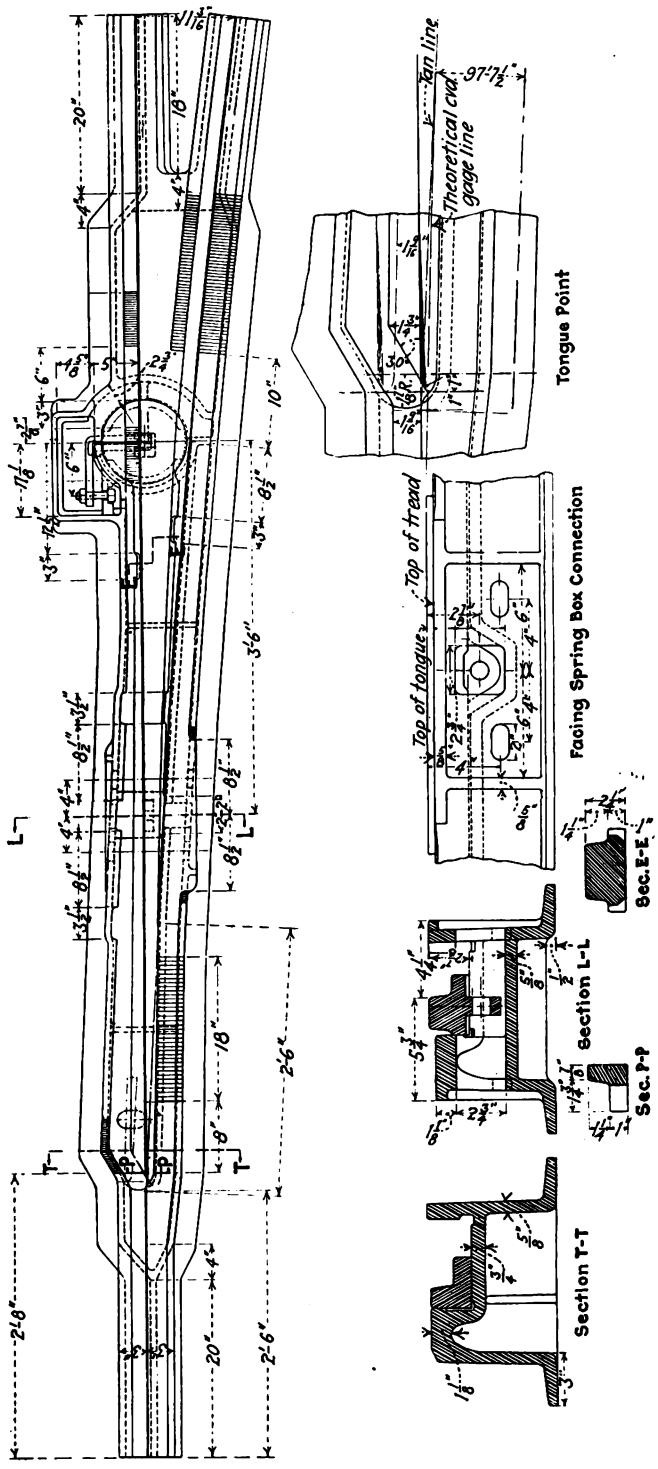
The average street railway has on its lines a great variety of tongue switches, there often being many different styles from a single manufacturer as well as entirely different designs by other manufacturers. The difficulty and expense of maintenance under these conditions is well known to all way engineers. As a result, some of the larger companies have adopted standards of their own, all the way from specifying certain overall lengths to complete designs covering all details. This



Details of tongue pin holding mechanism

has forced special trackwork manufacturers to carry a still greater variety of patterns. The cost of such multiplicity of designs is, of course, necessarily borne by the industry.

In designing a standard tongue switch it was kept in mind that to be satisfactory the switch must be not only as good as or better than existing designs but must be no more expensive. It is felt by the committee that these conditions have been met and it is desired that the new design should be tried out widely so as to demonstrate as quickly as possible whether or not it is satisfactory.



Proposed A.E.R.E.A. standard solid manganese steel tongue switch, 97 ft. 7½ in. radius, showing detail of tongue point, facing spring box connection, and four cross-sections. The type of heel and heel-fastening device is novel in several particulars. The pin is of the tadpole type of 9½ in. diameter and is carried down to a bed on the base of the 7-in. casting.

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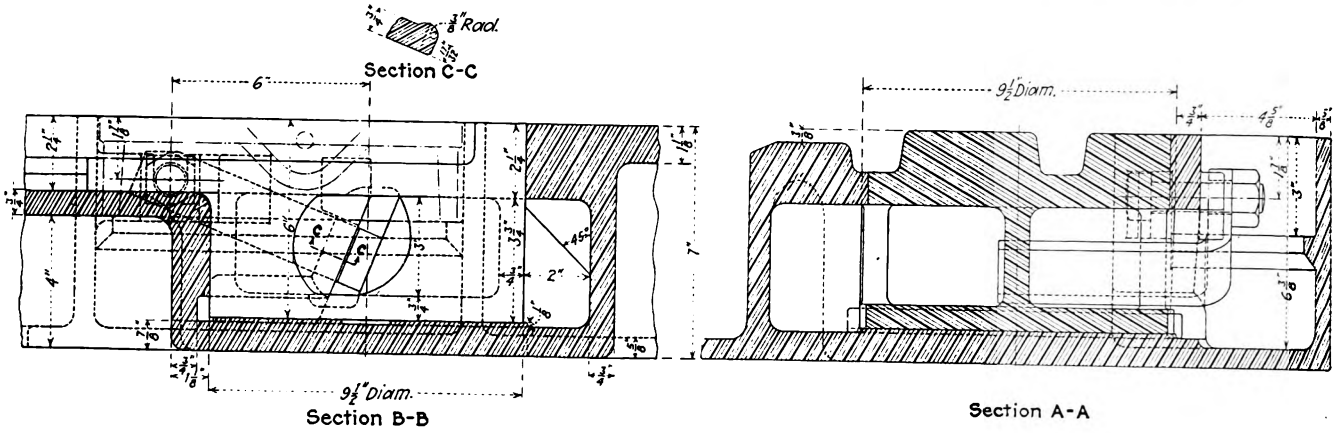


Sections at heel of proposed standard switch

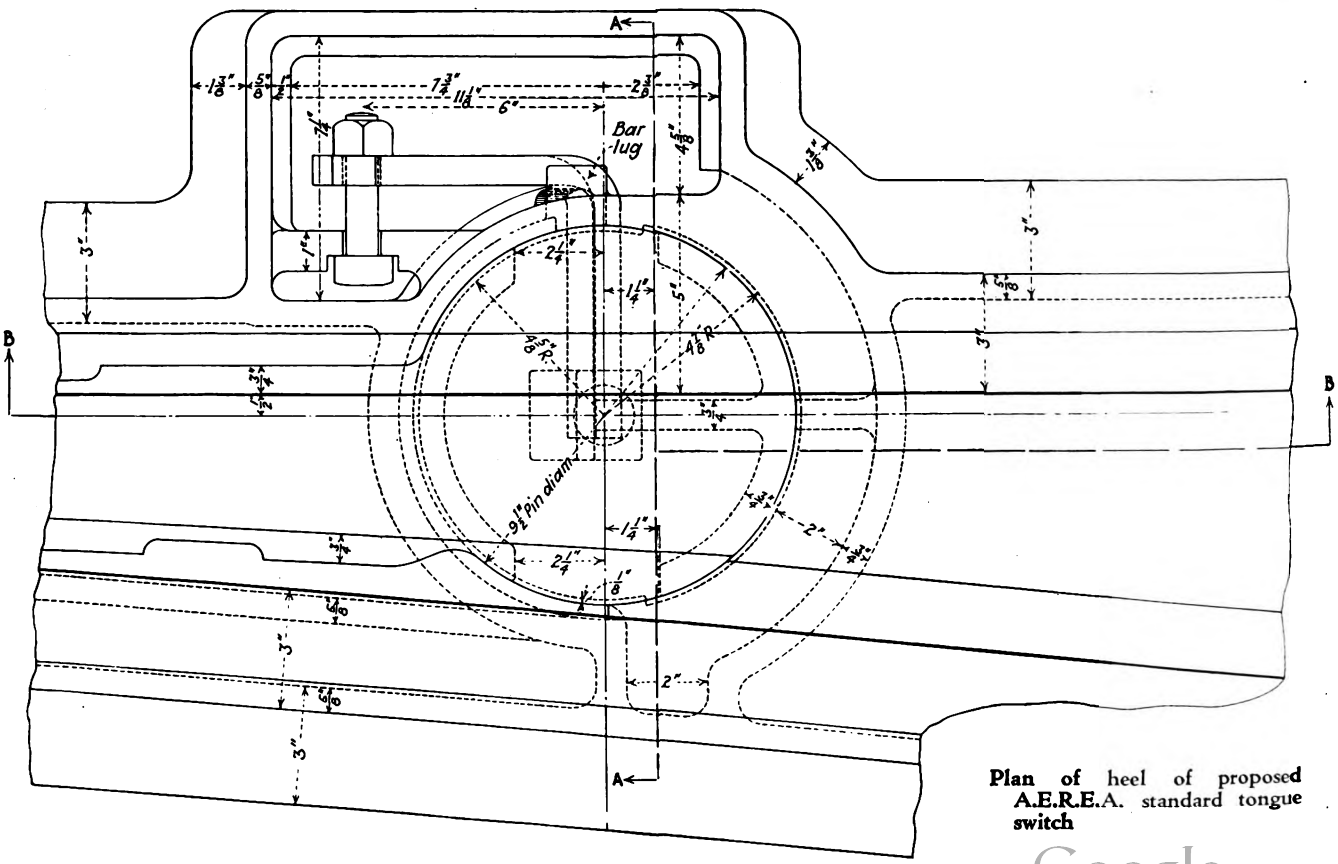
Detail drawings are shown herewith for a "100-ft." solid manganese switch, showing the general plan, the plan of heel, sections at heel and pin-holding device.

The type of heel and heel-fastening device is novel in several particulars, but is believed to be thoroughly sound and to present several marked advantages. The heel or pin is of the tadpole type, of 9½ in. diameter, and is carried down to a bed on the base of the 7-in. casting. This provides a vertical wall of large dimensions which resists any forward motion of the tongue under trailing traffic. The distributed wear on this wall will be very slight, even if the holding device is not kept in operative condition, so that the joint between heel of tongue and casting should not increase materially during the life of the switch.

The supporting area under the heel is as large as in any previous design and is located with special effectiveness, as the extreme rear portion has a bearing directly at its edge as the recess under the casting back of the pin makes it possible to grind the bed true at this point. This same recess extends all around the back of the pin, providing a space to be filled with oil or grease in the summer or salt in the winter.

The fastening device holds down and back as well. It consists of a lever held in place by a bolt which is readily accessible. The lever makes contact with the heel on an inside diaphragm at the center of revolution, thus providing rolling motion instead of frictional wear. The diaphragm also stiffens up the floor of the heel.

Arrangements have been made for a luncheon conference at the Hotel Hollenden, Cleveland, at 1 o'clock on Wednesday, Oct. 5, to talk over the desirability of the general adoption of this proposed A.E.R.E.A. standard tongue switch. This will provide opportunity for an interchange of opinion among those competent to pass on the design and bring together representatives of those companies which now have standards of their own. Tickets will be on sale at the association headquarters booth. The number of plates at the luncheon is to be limited to 50.



Plan of heel of proposed A.E.R.E.A. standard tongue switch

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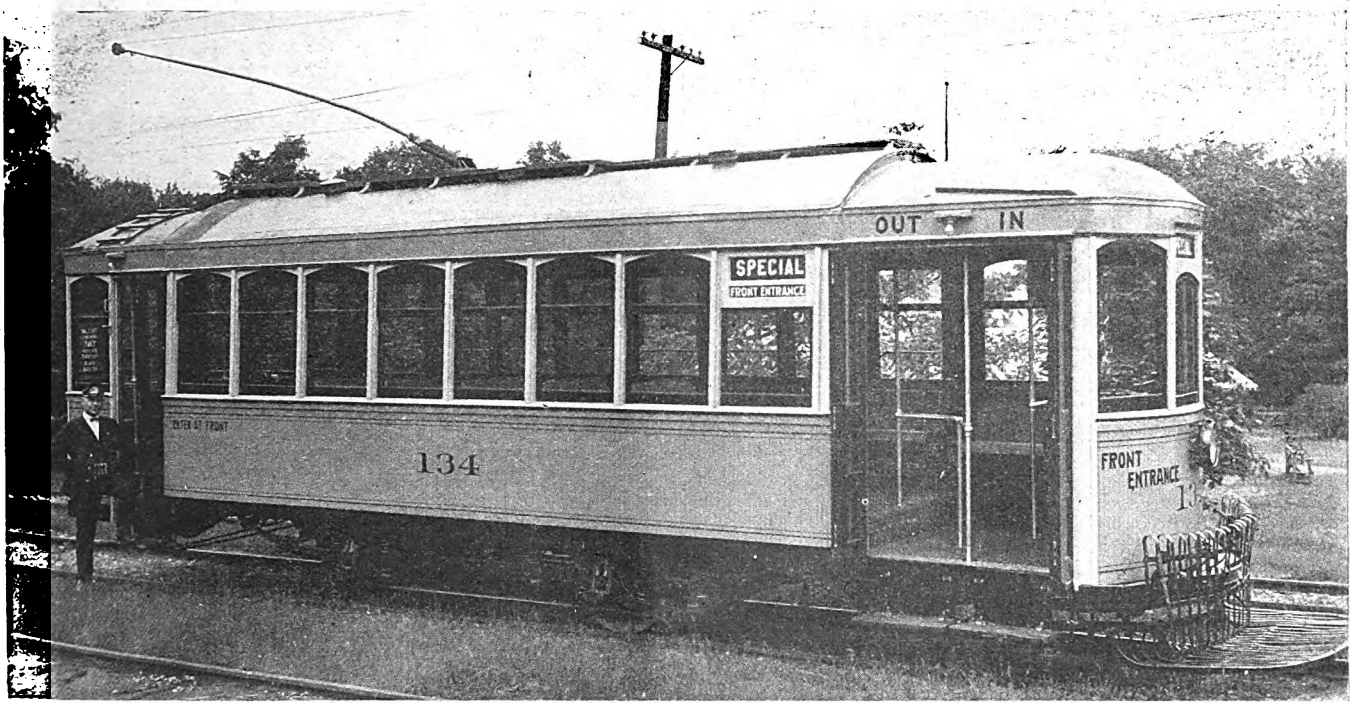
London, Ont., Cars Converted to
One-Man Safety Operation

By L. Tait
Manager and Secretary-Treasurer
London Street Railway, London, Ont.



Seven of these one-man safety cars have been turned out of the shops of the London Street Railway, London, Ont., Canada. They were converted from two-man, single-truck units

LAST fall the London Street Railway, operating in London., Ont., Canada, converted one of its two-man, single-truck cars to the safety type, with double doors in front and a treadle exit door in the rear. This work was in the nature of an experiment because the company's plan to convert fifteen of its two-man cars was not considered favorably by the City Council and it was therefore necessary to demonstrate that this equipment could be satisfactorily converted into up-to-date safety cars. Careful plans were laid to embody in the design all the requirements of an adequate safety car. Although some changes have been made from the first car converted, these have largely been in the nature of additional improvements, the most important being the installation of a unique back-up arrangement placed on the car for the purpose of turning it around "Y's" and also for backing out of the carhouses. The company's equipment all has single-end control and many of the lines have "Y's" at terminals. Because of increasing auto traffic and the use of a "Y" located on Dundas Street East, which is the main provincial highway through Canada between Detroit and Buffalo, it became increasingly necessary to devise some plan to back up safety cars in order that this equipment could be operated in safety around these "Y's" and without delay to traffic.

Many schemes were considered by the staff, including one to have the operator remove the controller and air brake handle from the front and carry them to the rear of the car. This was discarded on account of the work entailed in removing the handles. Likewise a plan to place the air line at the rear of the car with a small removable air brake handle was vetoed because it was felt that failure of an operator to remove the air brake handle after backing might result in operating troubles.

It was finally decided to use an ordinary hand brake at the rear, and the National Brake Company's Peacock staffless brake was selected and placed between the back cross seat and the small seat on the side of the car. In this way no seating space has been lost on account of the installation of the hand brake.

Directly above the hand brake on the side of the car a circuit breaker was installed, so that this apparatus can be operated with the left hand and the hand brake with the right. Wiring between the front of car and the rear circuit breaker is carried through the roof and along top of car. A heavy type knife switch mounted on a slate base and inclosed in a wooden box with only sufficient space for the travel of the handle is placed on the side of car to the left of the controller. This switch is connected at the top terminal to the front circuit breaker and at the bottom terminal of the switch to the

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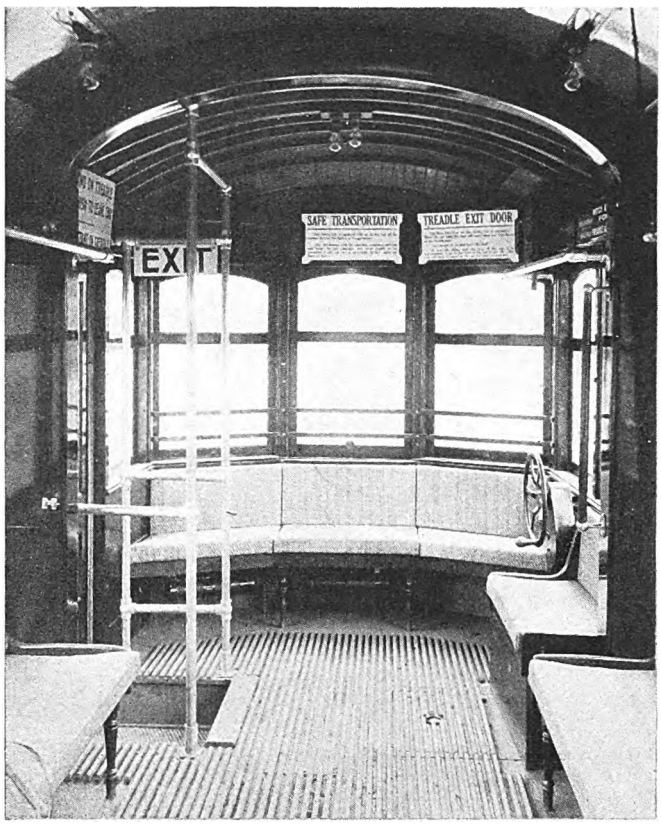
controller. The bottom terminal of this cut-out switch also has a wire connection through a conduit up the left front vestibule post, the wire running through the roof of the car and along the top to the circuit breaker at the rear. Final connection is then made between front and rear circuit breakers.

Operation of this device, which was described in the Maintenance Data Sheet Section of the JOURNAL, issue of Aug. 20, page 319, is as follows:

The operator opens the knife switch, which cuts the line between front circuit breaker and the controller. He then places the controller handle on the first position and hooks down the dead man controller handle with a special hook. This hook is so designed that it can be used only on the first notch. The controller is placed in reverse and the air brake released to the brake-off position. The operator then walks to the rear of the car and immediately operates the circuit breaker to close the circuit, using the hand brake to stop the car. The current flows from the trolley through the front circuit breaker, then through the rear circuit breaker and direct to the bottom connection of the knife switch, on to the controller set on the first position. After backing the car, the operator then proceeds to the front vestibule, removes the hook from the controller handle, adjusts the reverse controller lever and throws in the knife switch. The car is then ready to move forward.

This back-up device has now been in operation for six months and is proving entirely satisfactory, giving one-man operators a clear view of the roadway when backing the car. Previously, operators were having considerable difficulty in backing their cars in traffic, particularly backing up in winter with frosted windows.



View of rear platform of converted units, showing, at right, wheel which controls special back-up device

Motorman's position in new safety cars. Here may be studied, with the aid of the text, the mechanism which controls the back-up device specially constructed for "Y" operation

Reconstruction of the company's London West line of 1.1 miles was begun in August and the company has secured authority from the City Council to install a "Y" at the end of this line in a new location. One leg of the "Y" will be placed on a 40-ft. lot acquired for this purpose. But for this back-up device the company would have been faced with a difficult task, as no suitable property was available in that locality for the installation of a loop.

As far as general car rebuilding plans are concerned, a definite program has been followed for converting the two-man cars with safety equipment. This consists of completely stripping the cars and removing and thoroughly overhauling each truck, after which rehabilitation proceeds along these lines: Each unit is equipped with Canadian Westinghouse air brakes and safety devices and National Pneumatic door equipment, the latter consisting of two door engines for operating the entrance and exit doors at the front and treadle door equipment at the rear. The treadle door engine and its equipment have been placed in a well between the new floor of the car and the old floor of the drop platform at the rear. Installed directly opposite the treadle step and under a small seat placed lengthwise of the car, the well at first was fitted with a trapdoor which completely covered the treadle door engine and its equipment. Some difficulty, however, was experienced last winter in operating the treadle door engine during the very cold snaps, and this difficulty was overcome by boxing in the seat immediately over the well, cutting off half the trap cover and lowering the electric heater under this seat so that the well area could be heated during the winter.

Every car is equipped with two Hunter route signs,

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placed one in front and one over the first right-hand window. To distinguish safety cars operating at night from two-man rear-entrance cars, the boxes containing the route signs are made large enough to install a "Front Entrance" sign immediately below them. By this arrangement the two lamps used for the Hunter sign are made to serve a double purpose.

In addition, the units are equipped throughout with aluminum hand railing and stanchions. A mirror has been placed just above the front Hunter sign box so that the operator may see the treadle step and door when the curtains are drawn. All lamps in the front vestibule are fitted with shades and two heavy curtains shield the operator. These curtains slide on rings on rods, bent to proper position. One curtain is immediately back of the operator and the other extends from the front right-hand corner post to the fare box. Curtains at night shut out all reflection from the rear, but allow sufficient opening so the operator has a clear view to the right to observe passengers boarding and leaving car and for fare collection.

Consolidated car heaters with thermostatic control are being placed in each car. All wiring is alongside the cross seats on the right-hand side of the car and is carried in conduit. Air pipes are carried in racks, one pipe above the other on the left side of the car under the longitudinal seat which extends from the front to the rear bulkhead. In front the vestibule air pipes are racked on the side of the car just above the two front door engines. Special seats cover the door engines, these seats being closed in to the floor and provided with a removable face board so that the door engines may be adjusted. All air pipe lines in the vestibule are fitted with unions as well as the air pipe lines immediately connecting with the air brake valve head. This facilitates removal of the valve head for repairs without the necessity of disturbing other connections. Galvanized pipes are now used on all air lines to overcome scale. With all door engines fully inclosed and all air lines off the floor in racks, no difficulty is experienced in sweeping and cleaning under the seats.

Under the new plan the seating capacity has been increased to 41 passengers, a gain of seven seats over the old style two-man type.

Remodeling of Cars Has Pleased the Public

To date seven of the converted cars have been released from the shop, each unit being remodeled for approximately $2,700. The company recently obtained authority from the City Council to operate ten safety cars of this type in regular service. Incidentally, five small safety cars with no rear exit door, operated since 1922, had caused considerable unfavorable comment from time to time when safety car operation was under discussion. The converted car, however, is proving quite satisfactory to the public and many favorable comments are now being received by the management.

Full credit should be given to R. H. Welburn, formerly master mechanic, who is now acting in the capacity of consulting engineer, for the simplicity of the back-up device placed on this car and for many of the details for the conversion of the equipment. Although Mr. Welburn has been in the service of the railway since 1895, a period of 32 years, and recently celebrated his 80th birthday, he is still as actively interested in the equipment of the railway as any of the younger men in the organization.

Readers' Forum

Calculating Rail Tonnage

Upper Darby, Pa., Sept. 17, 1927.

To the Editor:

Reading the article by Edward A. Roberts in Electric Railway Journal of Sept. 10, setting forth a simplified method of calculating the amount of rail in a given length of track, called to mind the following formula:

Tons rail per mile track = weight rail per yard multiplied by 11 and divided by 7.

This can be readily verified by arithmetic. It is set forth on page 817-b of the 1911 edition of Trautwine and I would not be surprised if it were given in the first edition. Such a formula is easily memorized (just think of the galloping dominoes) and from it a table of quantities for various rail weights and lengths of track can be compiled.

L. E. Summers.

General Engineering and Management Corporation
New York City, Sept. 17, 1927.

To the Editor:

I note Mr. Roberts' method of calculating rail tonnages on page 426 of the Sept. 10 issue of the Journal. As most of the problems involving rail tonnages in the street railway field are calculated in feet and not in miles, I developed a simple formula of calculating rail tonnages when track measurements are in feet, as follows:

Number of lineal feet of track multiplied by weight of rail per yard, divided by 3,360.

This formula is correct for all weights of rail. While it may not be original with me, I have never seen it in print before.

Mr. Roberts' formula is, of course, built up on the familiar fact that 1 mile of 70-lb. rail weighs 110 long tons, by which, of course, rail is always bought. His formula is comparatively simple when rail weights are in even tens, but as a great deal of street railway track is built of rail with odd weights per yard there would be some difficulty in applying Mr. Roberts' rule.

C. G. Keen,
Railway Engineer.

Philadelphia, Pa., Sept. 12, 1927.

To the Editor:

In your issue of Sept. 10 is mentioned a rather longer method of applying a simple old formula which has been used in the rail trade for well over half a century. There are 1,760 yards per mile, so that for 2 miles it would take 3,520 yards of rail. There are 2,240 lb. in a ton, and 3,520 divided by 2,240 equals 11/7. There is therefore required per mile of road 11/7 of 1 ton of rail of 1 lb. per yard. Multiply 11/7 by pounds per mile and number of miles of single track to be equipped and you have the total number of tons of 2,240 lb. each of rails required. This formula of 11/7 multiplied by miles and pounds per yard is, I think, the simplest formula obtainable, though it can be shortened where the number of pounds or the number of miles is divisible by 7. For instance, if pounds per yard is 63, one would simply multiply 11 by 9, getting 99 tons per mile.

Francis Ralston Welsh.

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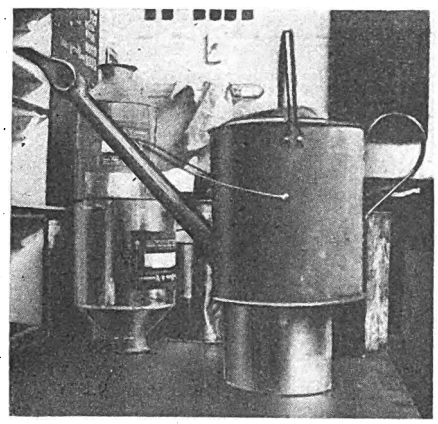
Maintenance Methods and Devices

Body Painting by the Flow Method

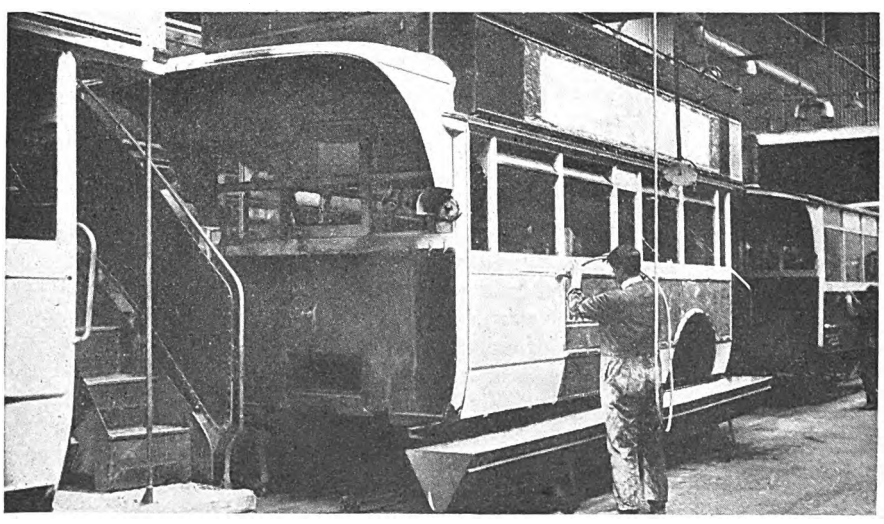
PAINTING bus bodies by the flow method, which is considered much more rapid than by the spray method, has been adopted in the Chiswick shops of the London General Omnibus Company. Briefly, the paint is allowed to run from a nozzle over the sides of the bus body in a broad thin stream. One coat by this method is considered equivalent to two by the brush method. It is used only for the final coat, the priming coat being put on by hand, and only about one minute is required by the flow method to paint one side of the body up to the waistline. The roof and top deck are painted by a spray gun and the interior of the lower deck (and of the upper deck in the case of covered top buses), the side posts and certain other parts of the exterior are painted by hand.

Keep your bearings from burning, while the car wheels are turning, by modern and improved lubrication learning.

When the flow method is used the paint may be put on in either of two ways, as shown by the accompanying illustrations. In one, the paint is contained in an overhead reservoir and flows by gravity through a flexible hose through a nozzle to the bus body. With the other method the paint is put on by a can which holds about 1½ gal. and looks very much like an ordinary watering can but has the same kind of a flat nozzle as that used when the paint flows through a hose. In both cases a V-shaped trough is used to catch the surplus paint which drops off the side of the bus.



Watering can for painting side sills



Bus bodies up to the waistline are painted by the flow method in the shops of the London General Omnibus Company. Only about one minute is required to paint each side. Paint is applied through a hose or by a can

When to Discard Wire Rope

JUST when to discard wire rope as worn out is a problem which depends on the local application of the rope and the degree of maintenance attention accorded during its period of service. Metallic area apparently unharmed cannot alone be taken as a criterion, since two ropes from the same reel, showing the same degree of wear and number of broken wires, may show under test a variation of 25 per cent in reserve strength.

There are several reasons for this variation, the principal one of which may be that one rope may have been subjected to excessive acceleration stresses which greatly fatigued the steel and caused considerable loss of strength, whereas the other rope may have operated under a more uniform tension and was never overstressed. Another factor might be the presence or absence of proper lubrication, which, of course, would affect greatly the degree of corrosion.

Wire ropes for shop cranes, electric or pneumatic hoists should be discarded when there are four or more broken wires in any one strand, when the outer wires have been worn to two-thirds of their original diameter; that is, when one-third of the wire diameter is worn off, or when loss of area exceeds 15 per cent for combined wire wear and broken wires.

When inspecting crane and hoist ropes it is always advisable to examine that section of the rope passing over the equalizing or compensating sheaves, as there is a slight movement of rope over these sheaves, causing abrasion or breaking of wires, which at times may prove dangerous.

When employed in the work of hoisting elevators or skips the wire rope should be discarded when there are more than three adjacent wires broken in any one strand, when the outer wires have become worn to two-thirds their original diameter or when marked corrosion appears.

The United States Bureau of Mines in Technical Paper No. 237 advocates that after shaft ropes have been in service for a period of three years, even if idle, they shall not be used unless tested for ultimate breaking strength. Indeed, any rope that has remained idle for some time should be submitted to the test of cutting off and examining the interior wires for possible corrosion and wear. The factor of safety on a deteriorated rope in this class of service should be 4 as minimum.

For boom topping lift, fall or hoist-

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ing lines, the rope should be discarded when there are six or more adjacent wires broken in any one strand or when the outer wires have been worn to one-half their original diameter.

Holding, closing and boom lines on locomotive cranes should be discarded in conformity with the rules given for the "derrick ropes," but when examination of ropes is made, attention should be given that part of the rope passing over equalizing sheaves.

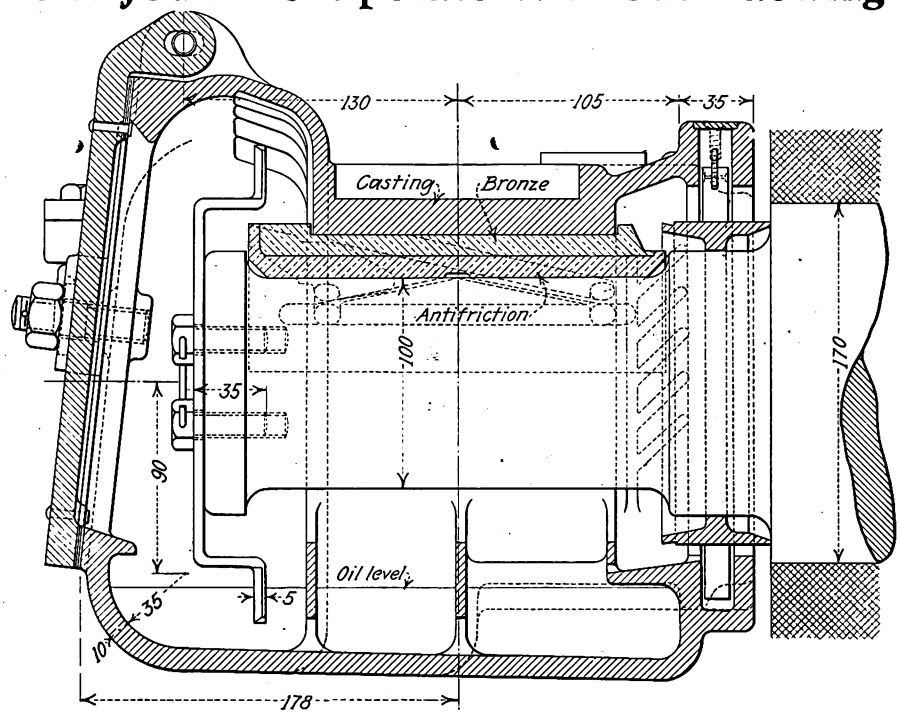
In the discarding of wire rope consideration should be made of the type of rope employed. It has been known, for instance, that a length of preformed wire rope, discarded as completely worn out, was capable of giving nearly twice the amount of service secured.

There are many places where life or limb will not be endangered by the breaking of a wire rope, such as car hauls, car transfers, spotters, etc. In such application a wire rope might conceivably be used until an entire strand breaks, but this general rule, of course, has no application to installations that might, in case of emergency, endanger workmen.

Weed Whipper Installed on Snow Sweeper

TO OVERCOME difficulties experienced from weeds growing between tracks, the Southern Ohio Public Service Company, Zanesville, Ohio, has arranged one of its sweepers with a weed whipper attachment. The rattan was removed from the rotary block of one of the brooms and the block was then incased entirely with angle iron bolted securely together. Holes were drilled through the iron to allow steel cables to be passed through and fastened with clips. When rotated these steel cables are given a whipping action so that weeds as they are starting to grow in the spring are destroyed. During midsummer, when the foliage becomes heavy, the cables have little effect.

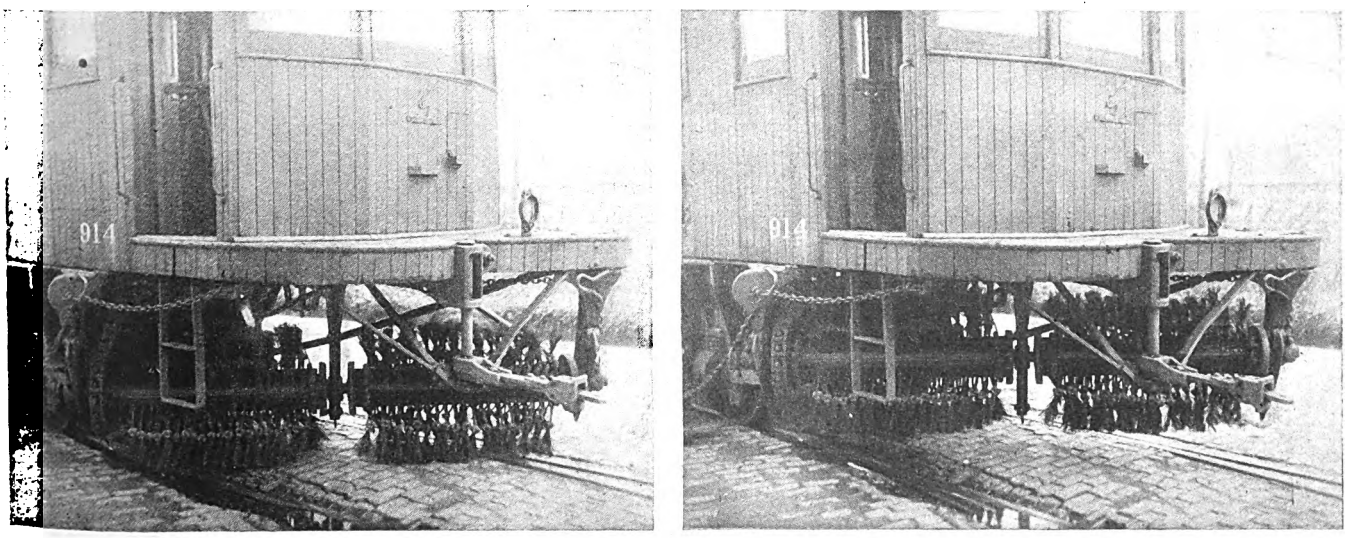
Car Journals Operate Without Packing



Longitudinal section of car journal, Paris subway car, showing splash plate (dimensions are in millimeters)

AN INGENIOUS method of splash lubrication for car journals is used by the Chemin de fer Metropolitain of Paris, which operates the subway and elevated system in that city. The construction is shown on the accompanying drawing.

The bearings are of anti-friction white metal and a small curved splash plate, 50 mm. (2 in.) wide and 5 mm. ($\frac{3}{16}$ in.) thick, is screwed on to the end of the car journal. The lower end of this plate dips in a reservoir of oil at the bottom of the housing and as the axle revolves oil is carried over and around the journal. No packing is used. An inspection of the journal is made every four or five days to see whether there is sufficient oil, but usually none is required. The records of the company show that the average consumption of oil per journal box is 16 grams per 1,000 car-km. (5.64 lb. per 100,000 car-miles) run.



At left, weed whipper attachment in lowered position; at right, raised position of weed whipper

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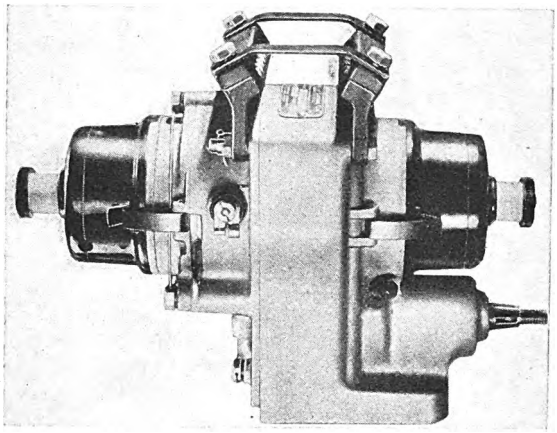
New Equipment Available

Heavy-Duty Ignition of Dual Type

DESIGNED especially for bus and truck use the North East Electric Company, Rochester, N. Y., has brought out a heavy-duty ignition unit of the dual type. It is used with two distributors and two coils furnishing two sparks to each cylinder. The unit has semi-automatic spark advance, uses four ball bearings and is built for magneto base mounting.

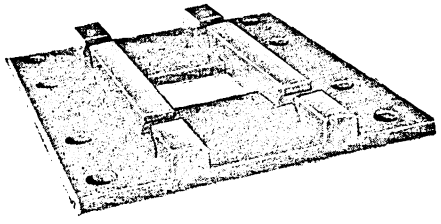


Dual type ignition unit

New Joint and Tie Plates of Hamburg Elevated Railway

NEW types of joint plates and tie plates manufactured by the Klöckner Works of Osnabruck have recently been adopted as standard by the Hamburg Elevated Railway of Hamburg, Germany. The two principal features of these plates are heavy ribs on the plates to hold the rail in place and a method of attaching the rail to the plate independent of the attachment of the plate to the tie. Among the advantages claimed for this plate are the following:

The strains from any movement of the rails do not come directly against the screw spikes holding the plate to the tie, hence they do not tend to work in the hole, become loose and pull out.



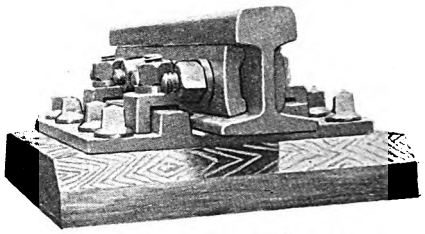
This joint plate rests on two ties

It is not necessary to change the screw spikes when a rail is changed.

The base of the plate completely covers the portion of the tie on which it rests, so that water does not get through the ties and start decay. The illustrations show a joint plate which is designed to rest on two adjoining ties. The tie plate is similar in construction to the joint plate except that it is less than half as long and has holes for only two screw spikes on each side. The heavy ribs between which the base of the rail rests are shown clearly in both illustrations.

The illustration above shows the clips for attaching the rail to the plate. Each attachment consists of four parts, as follows: (1) A U-shaped clip spannning the rib, one side resting on the base plate, the other on the base of the rail; (2) a bolt with a triangular head to fit into the triangular opening in the rib; (3) a nut which holds the rib to the base plate, and (4) a lock washer to hold the nut in place. The grip on the rail is so solid that it is expected longer sections of tracks can be welded when the track is exposed without danger of trouble from expansion and contraction.

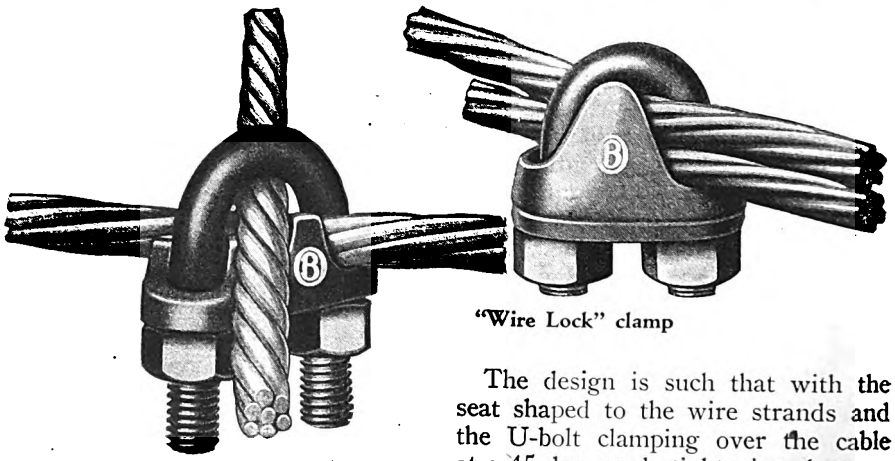
An adjunct to the plate not previously mentioned is a thin strip of poplar wood between the base of the rail and the plate. This sheet, which is treated for preservation against rot, is 5 mm. (0.2 in.) thick and is capable of being compressed to 3 mm. (0.12 in.) thick. The edges of this wooden strip, which bear no load, tend to swell and form ridges which prevent the rail still further from shifting in the plate.



Method of fastening rail to tie plate

Clamps for Two Wires

DESIGNED to hold two parallel or cross wires when making splices deadends, etc., the Ohio Brass Company, Ohio, is offering the "Wire Lock" clamp. The shaped seat or groove of the saddle and the angle at which the U-bolt clamps the strands are said to give great strength and holding power. These features permit the clamp to be installed easily and quickly without damage to the wire strands.



"Wire Lock" clamp

The design is such that with the seat shaped to the wire strands and the U-bolt clamping over the cable at a 45-deg. angle tightening the nuts draws the wires downward against the faces of the upright lugs in the shaped seat at the bottom. This provides both lateral and vertical compression on the wires over the greater part of their circumference.

The clamp is furnished in bronze or forged steel, either of which is recommended by the maker for use by electric railways and in overhead and distribution systems generally, the bronze clamp being particularly recommended on interurban and steam road electrification installations, where bronze or copper stranded cables are used.

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American Association News

Car Lighting Demonstration at Convention

OF PRIMARY importance among the factors which contribute to the comfort, convenience and safety of electric railway passengers artificial illumination has been accorded special attention by rolling stock committee No. 4 of the American Electric Railway Engineering Association. Supplementing its 1927 report, the committee has prepared a special lighting exhibit at the convention showing a number of recommended illumination systems. The Cleveland Railway has provided a car for this demonstration and installed the lighting equipment. This consists of four independent lighting systems, on separately controlled circuits. The car has a seating capacity of 55 with transverse seats at the rear and longitudinal seats at the front. These two arrangements of seats provide interesting comparisons of the amounts of light available from the various systems of illumination. The arch-shaped headlining is finished in a light color which gives the greatest efficiency in the utilization of natural and artificial light.

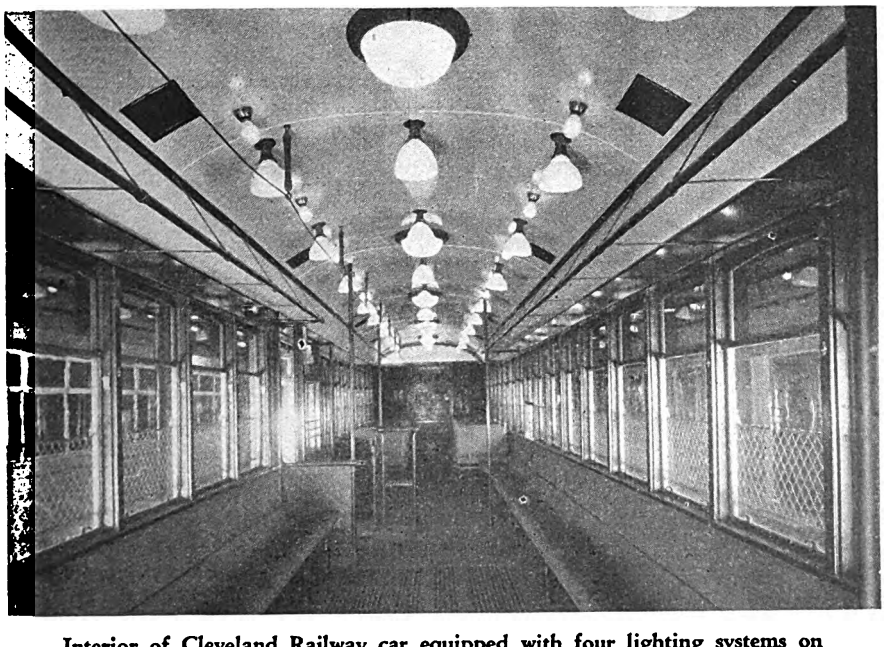
System No. 1 consists of five 12-in. ceiling type inclosing hemisphere fixtures (two qualities of glassware), each containing lamps that may be changed at will, but ordinarily totaling approximately 200 watts. The inclosing bowls are spaced at 8-ft. intervals on the longitudinal center line of the car. Pressed glass deep bowls and blown glass shallow bowls of the diffusing type will be used with this installation.

System No. 2 is composed of ten pendent type fixtures equipped with medium density deep bowl open glass reflectors and 56-watt, 115-volt, S-21 clear-bulb Mazda street railway lamps. The units are spaced at 4-ft. intervals on the longitudinal center line of the car.

System No. 3 has twenty pendent type fixtures equipped with open diffusing glass deep bowl reflectors and 36-watt, 115-volt, S-19 clear-bulb Mazda street railway lamps. These units are arranged ten in a row, one row on each side of the car over the seats on 4-ft. longitudinal centers. Both medium and light density glass reflectors will be shown with this installation.

System No. 4 employs 25 bare 36-watt, 115-volt A-19 inside-frosted bulb Mazda street railway lamps. They are mounted in two rows of twelve on each side, above the seats, with the remaining lamp placed in the center at the rear end of the car.

System No.	Reflector Glassware Density	Total Watts	Foot-Candles: Average Horizontal Illumination	Foot-Candles: 45 Deg. Plane Illumination Transverse Seats	Foot-Candles: 45 Deg. Plane Illumination Longitudinal Seats
1	Light	1,000	11.57	9.10	6.63
1	Medium	1,000	9.11	7.08	5.29
2	Medium	600	9.27	7.27	5.13
3	Light	800	8.67	6.30	5.00
3	Medium	800	10.13	7.93	6.67
4	None	1,000	11.68	9.33	7.00



Interior of Cleveland Railway car equipped with four lighting systems on separately controlled circuits

A summary of the average light intensities obtained on the horizontal and 45-deg. planes for transverse and longitudinal seats with each system of lightings is given in the table.

For convenience in reading fine print, such as newspapers and magazines, the committee has recommended a minimum light intensity of six foot-candles on the reading plane. This is defined as the 45-deg. plane at the normal sitting position at a point 33 in. above the car floor. Each of the four installations described will provide an average of six foot-candles or more on the reading plane at the transverse seats when lamps are operated at average rated voltage.

The fixtures and glassware were loaned by the Adams & Westlake Company, the Electric Service Supplies Company and the Macbeth-Evans Glass Company. The lamps were furnished by Mazda lamp manufacturers.

A cordial invitation is extended to all visitors at the convention to inspect this exhibit. The car will be open for inspection at all times and committee members or their representatives will be in attendance to demonstrate the various installations.

Many Special Acts Scheduled for Theater Party

CHOICE seats are still available for the theater party to be held at Keith's Palace Theater, Euclid Avenue, Cleveland, for Wednesday evening, Oct. 5, as one of the entertainment features of the convention. In order to avoid confusion in obtaining tickets after delegates reach the convention, they are urged to purchase them in advance. They may be obtained from T. L. Kennedy, vice-president Ohio Public Service Company, Box 693, Cleveland, Ohio. The committee in charge of the theater party has obtained many special acts and a special de luxe performance is assured.

Metropolitan Section Breakfast at Cleveland

DEFINITE arrangements have been completed for a Metropolitan Section breakfast during the Cleveland convention. This will be held on Wednesday morning, Oct. 5, at 8 o'clock in Parlor D on the second floor of the Hotel Statler. The breakfast will be simply a get-together meeting and all members are earnestly urged to attend.

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News of Other Associations

C.E.R.A. Master Mechanics Meet

SOME 75 representatives of the Central Electric Railway Master Mechanics' Association from several Midwestern states gathered in South Bend on Sept. 8 and 9 for a two-day program. Reports from the standardization committee and from the committee of uniform charges were read and other routine business conducted. George R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway and president of the association, presided.

Following the first meeting, luncheon was served in the hotel and the afternoon of the first day was devoted to addresses by D. F. Smith of the General Electric Company, Schenectady, N. Y., who spoke on "Railway Motor Manufacture and Maintenance," and by L. F. Mullen of the Sherwin-Williams Paint Company, Cleveland, Ohio, who spoke on "Insulating Varnishes." Later in the day a tour of inspection of the South Shore shops at South Bend was made.

The program on the second day began early in the morning when the guests were transported on a special train over the South Shore lines to Chicago and return, with a stop at Michigan City for an inspection tour of the shops there.

Specifications for Track Materials

ON SEPT. 9 the twelfth meeting of the A.E.S.C. sectional committee on specifications for materials for use in special trackwork and the design of 7-in. plain girder rails was held at the headquarters of the American Electric Railway Association in New York. The American Electric Railway Association is the sponsor body for these projects.

Present at the meeting were R. C. Cram, vice-chairman; J. E. Davidson representing J. B. Strong, E. B. Entwisle, W. G. Hulbert, E. F. Kennedy, E. P. Roundey, E. M. T. Ryder, and H. H. George, secretary. R. E. Hess, representing the American Society for Testing Materials, and G. C. Hecker, special engineer of the A.E.R.A., also attended. Mr. Cram presided at the meeting.

The work of the committee covering design of 7-in. plain girder rails was completed late in 1925, and the designs were adopted as tentative American standards July 1, 1926. The specifications for special trackwork materials have now taken definite shape as the result of the work of a special committee on form consisting of Messrs. Ryder, Alden and Cram. This committee presented a tentative specification, which was approved at the meeting after thorough discussion. The specifications will be submitted to the entire membership of the committee for formal letter ballot and upon approval will go to the sponsor body for approval and submission to the A.E.S.C.

Work of the committee has been delayed through the deaths of its chairman, Victor Angerer, and of George L. Fowler. R. C. Cram was elected chairman to succeed Mr. Angerer and E. B. Entwisle was elected vice-chairman to succeed Mr. Cram.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Sept. 26-30 — National Safety Council, annual congress, Hotel Stevens, Chicago, Ill.

Oct. 3-7—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.

Oct. 4 — American Automobile Association, Motor Bus Division, Cleveland, Ohio.

Oct. 18-21—National Association of Railroad and Utilities Commissioners, thirty-ninth annual meeting, Baker Hotel, Dallas, Tex.

Oct. 26-27—Public Utilities Association of West Virginia, annual convention, Parkersburg, W. Va.

Oct. 26-27—Society Automotive Engineers, Transportation Section meeting, Hotel Sherman, Chicago, Ill.

British Fares Vary Greatly

ORDINARY fares on British municipal tramways vary per mile from 0.67 cents (in Glasgow) to more than 2 cents on some of the smaller lines, as in Cardiff and Dundee. The average fare varies from 1.86 cents (in Aberdeen) to 3.34 cents in Burnley. The average fare in Glasgow is 2.776 cents and in London 2.9 cents. Only three of the seventeen principal municipal systems sell season tickets. Glasgow, New Castle and Aberdeen are the only systems having adult fares less than 1d. (2 cents), though three others have such a rate for children only.

These figures are given in a paper on "Maximum and Minimum Fares," presented at a meeting of the Municipal Tramways and Transport Association at Cardiff, Sept. 7-9, by Lachlan MacKinnon, general manager of Glasgow Corporation Tramways. In speaking of the Glasgow system he said that the ½d. fare in that city was given up in 1920 but reintroduced July 1, 1927. A 2d. (4-cent) maximum fare is still in force in Glasgow and has helped increase the receipts and reduce bus competition. The speaker believes in the principle that the long-distance passenger should pay a lower rate per mile than the short-distance passenger.

This was the only paper scheduled for the meeting, though there were a number of conferences. The presiding officer was R. L. Horsfield, general manager Cardiff City Tramways, who referred to the changed name of the association, which is now Municipal Tramways and Transport Association, to recognize the bus service by members. He said that the number of buses so operated has increased from 326 in 1920 to 1910 in 1927. He thought the idea that tramways had become obsolete was disproved by the fact that last year the British tramways carried 4,668,812,206 passengers, an increase of more than 48,000,000 over the previous year.

Utilities Commissioners to Meet at Dallas

DALLAS, Tex., has been selected for the 39th annual convention of the National Association of Railroad and Utilities Commissioners. The meetings will be held at the Hotel Baker on Oct. 18-21.

According to the call for the convention issued by Secretary James B. Walker, one whole session will be devoted to the regulation of motor vehicle carriers. There will be reports from the committee on motor vehicle transportation, Hon. Amos A. Betts chairman, and the committee on motor vehicle legislation, Hon. John E. Benton chairman. There will also be an address by H. S. Ives on insurance.

There will be a round-table discussion of "Holding Companies." In addition the several committees of the association will present reports.

The address of welcome will be delivered by Governor Dan Moody of Texas. Hon. John J. Esch, chairman Interstate Commerce Commission, will deliver an address if possible. Other speakers will be United States Senators Pittman of Nevada and Mayfield of Texas, F. A. Farrar, president Investment Bankers Association; Chief Justice Cureton of the Texas Supreme Court; Senor Alexjandro P. Carillo, Mexican Consul-General at San Antonio; Albert L. Reed, member of the National Industrial Traffic League and Industrial Traffic League of Texas, and Prof. W. M. W. Splawn, president University of Texas.

William A. Prendergast, chairman Public Service Commission of New York, will speak on "Valuation." H. G. Taylor of Nebraska, now with the American Railway Association; Carl D. Jackson, Alexander Forward, M. H. Aylesworth and Hon. Sherman T. Handy also will speak.

Prominent executives of the railroad and public utility organizations on the program will include Gen. W. W. Atterbury, president Pennsylvania Railroad; Walter S. Gifford, president American Telephone & Telegraph Company; Oscar H. Fogg, next president of the American Gas Association; Lucius S. Storrs, managing director American Electric Railway Association; Paul S. Clapp, managing director National Electric Light Association; John S. Wise, Jr., president Pennsylvania Power & Light Company.

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News of the Industry

Seattle Continues Discussion

Extension of payment of Municipal Railway purchase bonds before Council—New move in Von Herberg suit

A NEW attempt to secure an extension in the payment period for the $15,000,000 Seattle Municipal Street Railway purchase bonds has been launched in the City Council of Seattle, Wash., with an apparent intention of removing from the office of Mayor Bertha K. Landes to the Council chamber the seat of negotiations for such an extension.

In a resolution introduced by Councilman A. Lou Cohen, the president of the Council is authorized to appoint a special committee to negotiate with representatives of the Puget Sound Power & Light Company and other bondholders. At present Mayor Landes is negotiating with A. W. Leonard, president of the company, by a tacit understanding of Council members, with the idea that the negotiations would continue, and Council members could participate. Mr. Cohen pointed out that the extension plan, recognized as vital to the successful financing of the railway system, had been hanging fire for five years, but so far without tangible results.

Legal Difficulties Retard Settlement

The carrying on of the negotiations with the Puget Sound Company has been complicated by the various legal entanglements in which the municipal railway has been embroiled, including the Von Herberg suit, brought to prevent the railway setting aside any funds from its revenues to pay on the purchase bonds until all salaries and operating costs were paid. Mr. Leonard declared, when the suit was brought, that all negotiations, as far as the company was concerned, would be held in *status quo* pending settlement of the litigation.

Asking for dismissal of the action and assesment of costs against the plaintiffs, Thomas J. L. Kennedy, corporation counsel for Seattle, has filed a motion for leave to file an amended and supplemental answer in the suit of J. G. Von Herberg against the city in the railway litigation. At the same time, the city has set up an affirmative defense and filed a bill of interpleader. This is the first move taken in some time in the litigation which started last February, when Mr. Von Herberg purchased some of the "no-fund" warrants issued in payment of the December wages due the trainmen.

All phases of the cases involving the railway system will be argued before Circuit Judge Frank S. Dietrich when he arrives in Seattle within the next two weeks. Two separate suits are pending, that of Mr. Von Herberg's to halt payment of funds to the bondholders, and one brought by the Puget Sound Power & Light Company to halt this character of litigation involving the system.

The city charges that Mr. Von Herberg purchased the wage warrants merely to continue the "vexatious litigation against the city of Seattle."

Hearings Begun on Omaha Franchise

The City Council of Omaha, Neb., has begun hearings on the draft prepared by City Attorney Van Dusen of the proposed franchise for the Omaha & Council Bluffs Street Railway. Senator R. B. Howell presented his plan for forcing the company, as the price of getting a new franchise, to agree to sell its Missouri River bridge to the city. Spokesmen for the company say no consideration will be given the proposal. Counsel for the Guaranty Trust Company of New York, trustee for the bondholders, has received no instructions as to the clause contained in the city attorney's draft which makes it a condition of the grant that the trustee shall concede that the present franchise is not perpetual.

New York Plan Expected Soon—Mr. Dahl Ordered to Answer

Samuel Untermyer, special counsel for the New York Transit Commission, has nearly completed his report, which will contain his recommendations for transit readjustment for New York City. It is understood a feature of the plan will include recapture of the B.-M. T. subway system, recapture of the Interborough east side subway in event property of the Interborough and B.-M. T. companies cannot be acquired by purchase, and the combination of these lines with the new city subway system. The plan also will contain recommendation for referendum as to whether the fare shall be increased in case the combined system shows deficit of whether any deficit on 5-cent fare shall be paid by taxpayers. It is expected the plan will be ready before Oct. 1.

In the case of Chairman Dahl of the Brooklyn-Manhattan Transit Corporation, who must answer certain questions by Samuel Untermyer, special counsel to the Transit Commission, Justice Frankenthaler said:

The court will require all questions to be answered which bear on the holdings of B.-M. T. stock in the I. R. T. both at date of refusal to testify and for a period of three months preceding. The price and time of purchase need not be given, but quantities of purchases and sales as well as holdings must be fully and frankly stated.

Emergency Rate Denied

Maryland commission is not satisfied that public interest requires higher temporary rates in Baltimore

THE Maryland Public Service Commission has refused to grant an emergency increase in fares to the United Railways & Electric Company, Baltimore, pending hearing on the company's application for a permanent fare of 10 cents. At the same time the commission dismissed the petition for an emergency increase it set Oct. 26 as the date to start hearing the petition for a permanent 10-cent fare. In denying the emergency increase it was stated that the United had failed to make it appear to the satisfaction of the commission that the public interest required the establishment of substantially increased fares or temporary emergency fares pending the establishment of permanent fares, or that establishment of such temporary emergency fares was necessary for the purpose of providing adequate and efficient service, or for the preservation of property.

The hearing had been conducted several days and was hurried through as soon as possible. Opposition to the temporary increase was led by Thomas J. Tingley, people's counsel, who was assisted by attorneys representing the city and various organizations opposed to the increase. Although the United had requested an increase as an emergency it left the amount of increase to the commission. Charles D. Emmons, president of the company, said on the stand, however, that the company thought it should receive a temporary increase to 10 cents pending the hearing to make the 10-cent fare permanent.

The application to be heard in October is for a flat rate of 10 cents, 5-cent or half fare for children between four and twelve years of age, school tickets at 5 cents each and special commutation rates. The present fare is 8 cents, with two tokens for 15 cents.

Bill Drawn to Continue Public Control of Eastern Massachusetts

Extension of the period of public control of the Eastern Massachusetts Street Railway, Boston, Mass., for ten years from the date of the termination of the present period of Jan. 15, 1929, is proposed in a bill drawn for introduction at the coming legislative session. Among the bodies that favor the plan is the Savings Bank Association of Massachusetts. The proposed act contains twelve sections substantially the same in their provisions as those contained in the present act. The whole act is based around the provision in Section 1 to the effect that:

The company may, subject to the pro-

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visions of this act, exercise all the powers and privileges of a street railway company organized under the general laws, so far as the same are applicable, and, subject to the approval of the department of public utilities, hereinafter referred to as "the department," any powers or privileges granted by any special acts applicable to the company, until the general court shall otherwise provide, and shall be subject to all the duties, restrictions and liabilities imposed upon street railway companies, except as otherwise provided herein.

Higher Fare in Lorain Expected

Rates of fare on cars of the Lorain Street Railroad, operating in Lorain, Ohio, are to be increased soon to 6 cents, with an extra cent for transfers. No definite date has been set for the new rate to go into effect.

Inability of the company to operate on its present income has forced the increase in rates, according to John W. Heim, superintendent.

On the Alert in Buffalo Against Accidents

Co-operating with a local newspaper in a campaign to reduce traffic accidents, Bernard J. Yungbluth, president of the International Railway and the International Bus Corporation, Buffalo, N. Y., has issued a general order to all trainmen and bus drivers to continue their efforts to reduce accidents and promote a greater degree of safety. In his general order President Yungbluth said that if there was any question as to the right-of-way, trainmen and bus drivers should play safe, observe scrupulously the commands of traffic signals, and be particularly careful when children are at play. He recommended a redoubling of efforts to reduce the appalling loss of life occurring through street accidents. "Let us constantly be on the alert," he said, "that the splendid record in safety you have set up may be continuingly improved."

The president of the traction and bus company said that in spite of the heavy increase in the registration and use of automobiles, the total number of accidents in which the company's cars and buses were concerned was 9.6 per cent less this year than last; 14.2 per cent less than in 1925 and 24.4 per cent less than in 1924.

Fares Increased in Michigan City

The Chicago, South Bend & Northern Indiana Railway has been authorized by the United States District Court at South Bend, Ind., through R. R. Smith, receiver, to increase the fare on local lines in Michigan City from 5 cents to 7 cents. The application for a higher rate of fare in Michigan City alleged that the company had incurred a deficit last year of $25,245 in operating its cars in that city. The company operates approximately 90 miles of interurban and city lines in north central Indiana.

Argument Started on Schenectady Fare

The first hearing on the petition of the Schenectady Railway seeking a reasonable rate of fare on the lines in Schenectady, Albany, Rensselaer and Saratoga Counties, N. Y., was held on Sept. 8. Authority is also sought to file schedules authorizing a 10-cent fare and 5-cent school token in Schenectady, with corresponding increase in the various fare zones on its divisions to Albany, Troy and Saratoga Springs. The company proposes to issue commutation tickets or 50 rides at commutation rates.

In answer to the query of Mayor Blessing of Schenectady, on the jurisdiction of the commission to fix fares in Schenectady, as such fares had heretofore been fixed by the Common Council, John E. MacLean, attorney representing the Schenectady Railway, said the question had been decided by the Appellate Division of the Supreme Court in the United Traction Company case that the commission had jurisdiction in such proceedings. Commissioner Pooley advised Corporation Counsel Poersch that the commission would reserve decision on the question raised and permit the railway to present such proof at this time as it were prepared to present.

Daniel Naylon, representing the Schenectady Railway, recited the history of the company and concluded with the statement that its present financial condition was such that a serious crisis confronted it inasmuch as its income was insufficient to go on and perform its duty as a public carrier. Adjournment was taken to permit the representatives of the city to examine the evidence and exhibits presented by the company and for the commission to determine the points raised by the city.

Delos Wilcox to Report for San Francisco

At a recent conference between the public utilities and the finance committees and City Attorney John J. O'Toole, at which Delos F. Wilcox was present, the need of expert advice and information was generally conceded and Mr. Wilcox was designated as the man most familiar with San Francisco's situation, sympathetic with the movement of municipalities in acquiring their own transportation and thoroughly competent to make a comprehensive study.

The survey that Mr. Wilcox will make for the city of San Francisco will deal with the expiration of franchises of the Market Street Railway, the best methods of acquiring the properties and the elimination of duplication of service. Major franchises begin to expire in 1929 and the public utilities and the finance committees are making their recommendation of a survey so that the city may be in a position to act when the franchises run out. Mr. Wilcox is reported to have said:

San Francisco is in a better position to solve her transportation problems than any other city in the United States that has already a system controlled by private ownership. This is due in part to the fact that the city has the nucleus of a city-wide system and in part because the franchise of the privately operated lines are nearing their end. I am convinced that a consolidation can be effected in a manner satisfactory to the public.

Mr. Wilcox estimated the survey would require about two months and set his price at $5,000 a month. He is prepared to undertake the work at once.

The recommendation to the Supervisors will be made by the City Attorney, whose office had for several weeks been investigating the legal phases of the franchise expiration and the city's rights relative to taking them over.

Want Overhead Wires in Columbus Removed

The City Council of Columbus, Ohio, has asked C. C. Slater, general manager of the Columbus Railway, Power & Light Company, to explain in writing the cause of delay in starting work of removing poles and overhead wires in North High Street between Fifth and Arcadia Avenues. The company has until April 1, 1928, to complete the work but was ordered to start the program several months ago. A 30-day extension, which expired six weeks ago, was later granted and so far no work has been done.

Economics at Boston

Under the caption "Every Day Economics" the Boston Elevated Railway, Boston, Mass., is running in *Co-operation*, its official publication, short chapters from the new book of J. E. Le Rossignol, called "First Economics." Special arrangements have been made with the publishers, the A. W. Shaw Company, for the reproduction of any or all of this book by the Boston Elevated Railway. In August *Co-operation*, there are excerpts on income, wealth and capital. Here are valuable lessons for the employees in the rudiments of economic management and finance.

Change in Rates on Reading Line

A reduction in the cost of monthly 30 round-trip tickets became effective on the lines of the Reading Transit Company, Reading, Pa., on Sept. 1. The new and old rates follow:

	New Reduced Rate	Old Rate	Saving
2 Zone Books.....	$6.25	$7.25	$1.00
3 Zone Books.....	7.50	9.50	2.00
4 Zone Books.....	8.65	11.35	2.70
5 Zone Books.....	9.65	12.65	3.00
6 Zone Books.....	11.75	15.75	4.00
7 Zone Books.....	12.75	17.50	4.75
8 Zone Books.....	13.80	18.55	4.75

On Sept. 1 the company also resumed the sale of its round-trip excursion tickets between Oley Valley towns and Reading. The round-trip fare to Friedensburg is 45 cents and to Boyertown 90 cents. Each ticket allows a six-day stop over privilege.

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Fight in Columbia Gains Many Adherents

The transportation problem in Columbia, S. C., long discussed in the public prints and often in the courts, has come in for attention from three new angles recently — the executive board of the Richland County Federation of Women's Clubs has gone on record as favoring the restoration of railway service in Columbia and the school board of the city of Columbia and the board of trustees of Chicora College (a denominational school located in Columbia) have filed intervention petitions with the state Supreme Court with regard to the action instituted some time ago against the Broad River Power Company to bring about a restoration of railway service.

The club women urge the use of every effort to have the railway service reestablished as they are convinced that it is the safest and most reliable system of transportation.

In its intervention petition the Columbia city school board sets forth that an adequate railway system is for many reasons the most desirable form of transportation service for Columbia and its environs, and particularly for this petitioner's purpose for furnishing a safe and reliable means of transporting the school children; further, that the school problem in the city of Columbia is now tremendously increased and rendered more difficult by the lack of an adequate or satisfactory transportation system. The petition from the Chicora College trustees sets forth that the "students and faculty are largely dependent upon an adequate system of public transportation for its best service to the state and community."

This case will likely come up for hearing before the State Supreme Court in October. Several weeks ago the Attorney-General of the state instituted suit for a writ of mandamus requiring the Columbia Railway, Gas & Electric Company to resume the operation of street cars, discontinued last March. The matter has been before the courts for some time. At present, buses are in operation in Columbia and also 10-cent jitneys, which operate without restrictions at present. The jitney, it is generally believed, had much to do with cutting down the patronage of street cars as the jitney takes its passenger to his door. But the jitney has neither schedule nor route, often goes off the street in disagreeable weather and is a free lance in the transportation business.

Smoking Killed in Atlanta

By a vote of nearly four to one Atlanta, Ga., street-car riders have requested the continuance of the present rule forbidding smoking. Not only were hundreds of individual letters received, but many petitions as well, some signed by as many as 100 riders.

Some of the reasons given why smoking should not be permitted were as follows: The unpleasant and unhealthy atmosphere in smoke-filled cars during seasons when ventilation was not always possible, danger of fire and difficulty for railways to preserve their reputation for cleanliness. Finally, it was generally agreed that any normal man could refrain from smoking for the short period of time he was on a street car and that any gentleman would be glad to do this rather than cause discomfort to his fellow-passengers. The vote against allowing smoking in the cars was so definite that the rule prohibiting smoking will be kept in force.

Inquiry Started on Philadelphia Suburban Rates

Increased rates, effective July 20 on the lines of the Philadelphia & West Chester Traction Company, Upper Darby, Pa., were called for inquiry before James S. Benn, Public Service Commissioner, at a hearing in City Hall on Sept. 15. Protests had been filed by many organizations.

In a statement read by A. Merritt Taylor, president of the company, it was set forth that the investment was $5,466,725, with the company entitled to a return of 7 per cent. This, he said, in view of a decrease in return of 3.49 per cent in the year ended Aug. 26, compared with the previous year, necessitated an advance in fares to keep the company out of bankruptcy. The hearing was continued.

The schedule of fares, which was published in the ELECTRIC RAILWAY JOURNAL, issue of July 2, page 33, called for a flat 10-cent rate where formerly the zone rate was 8 cents.

State Department Overrules Boston Transit Commission

In a case involving the construction of a section of the Dorchester rapid transit system the Massachusetts State Department of Public Utilities has overruled the Boston Transit Commission. The Transit Commission opened bids last August for the construction of Section 4, but decided to reject all the bids on the ground that the time wanted to build the section seemed to the commission "unreasonable, excessive and impracticable because of reasons special and peculiar to the work." The lowest bidder wanted 300 days and the commission was of the opinion that it should be done in 200 days. Hence the commission requested the Public Utilities Department to authorize the rejection of all the bids. In its decision the Department of Public Utilities says:

At the hearing the chief engineer of the Transit Department testified that, in his opinion, the time reasonably required for the completion of Section 4 of the Dorchester Rapid Transit Extension was not more than 200 days, and it was contended that the necessities of the public for the improved transportation contemplated by the act required the completion of the work as soon as it was reasonably possible to do it, and that to take 300 days to complete the work of Section 4 was not in the interest of the public and that, consequently, there were reasons, special and peculiar, which made it impracticable to proceed under any of the proposals submitted, and thus a rejection of all the bids was justified, under the provisions of Section 15 of said Chapter 480, in order that arrangements might be made by which the work included in Section 4 would be completed within 200 days. The Transit Department did not include this 200-day limit in its proposals.

The statute obviously contemplates that where practicable proposals for contracts shall be advertised and open to competitive bidding and the contract made with the lowest responsible and eligible bidder. We feel that we ought not to authorize a departure from the general plan contemplated by the Legislature unless it is clear that the public will derive substantial benefits thereby. While we are satisfied that the Transit Department has acted in good faith, a majority of us are not convinced that such substantial benefits will be derived from the rejection of the bids as to warrant our authorizing such action.

Accordingly, it is ordered that the petition be and hereby is dismissed.

Commissioner Goldberg dissents.

More Dissension Over Holyoke Fares

A special committee of Aldermen has been appointed by the City of Chicopee, Mass., to investigate and hand down its finding on the proposed increase in rates by the Holyoke Street Railway, Holyoke, Mass., in so far as those increases affect patrons from Chicopee. The committee is anxious to seek a further postponement on hearings regarding these fare changes, which were scheduled to go into effect Oct. 1. The Holyoke Street Railway has stated that increased rates in Chicopee, were essential to the continuation of service on that line. Mayor Michael I. Shea is opposed to the rate increases. The main objection to the rate changes is based on alleged discriminations. According to reports the objection lies in the fact that citizens of Chicopee will be forced to pay a fare increase of 10 cents, whereas citizens in certain sections of Holyoke will pay less.

Another "Coming Out" of Guide Book

The third edition of Guide and Information, published by the Boston Elevated Railway, Boston, Mass., and distributed to tourists and others desiring information regarding the railway, has just come off the press 50,000 strong. The folder is being furnished to all employees.

Compared with the second edition, issued late in 1926 and comprising 100,000 copies, the third edition is designed to stimulate riding as well as to furnish specific information desired by users of the service. It has been made smaller than the second with the idea of bringing out future editions at more frequent intervals. On the large colored map, the central feature in the folder, revision on route changes have been included.

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Special Sunday Trips Out of Reading

The Reading Transit Company, Reading, Pa., started on Sept. 18, and continuing each Sunday thereafter for a 30-day trial period, a one-day excursion trip from Reading to Lancaster and return for $1.25. The route from Reading to Lancaster passes through some picturesque sections of Berks and Lancaster counties. The first car for Lancaster leaves Reading at 4.30 a.m. and every hour thereafter. Returning, the last car for Reading leaves Lancaster at 10 p.m.

Tickets are for sale only at the cashier's office, 412 Washington Street. They cannot be purchased from the conductors.

West Penn Dedicates Lake to Public Uses

Before an assembly of notables, including Gov. Howard M. Gore of West Virginia and his staff, industrialists, bankers, power officials and engineers, the West Penn Electric Company, a subsidiary of the American Water Works & Electric Company, dedicated to the public use on Sept. 14 Lake Lynn, a recreational development. Railway subsidiaries of the American Water Works & Electric Company include the Monongahela West Penn Public Service Company, Fairmont, W. Va., and the West Penn Railways, Pittsburgh, Pa.

Lake Lynn was created by the Cheat Haven hydro-electric development of the West Penn System on the Cheat River in West Virginia, 80 miles south of Pittsburgh. It stretches 13 miles through the West Virginia hills. It was named in honor of the late Albert M. Lynn, former president of the West Penn properties, during whose administration the Cheat Haven project was developed and put into service. A memorial to Mr. Lynn was unveiled during the ceremonies.

Lake Lynn will perform a dual service for people in this region. It will not only furnish an ideal place for recreation, as there are no lakes of any considerable size in this territory, but also the 52,000-kw. power plant located there will provide additional energy to meet the demands of the expanding industries along the Monongahela and Cheat River Valleys.

Teaching "Safety" in Indiana

"Safety Always" was the slogan of a car of the Interstate Public Service Company which visited Scottsburg, Ind., on Sept. 21 and was viewed by many people. The car bore signs and posters urging safety at all times and was thoroughly equipped to convey lessons in safety to all who visited the exhibit. Instructions in the Schaefer prone pressure method of resuscitation were given during the exhibit by an employee of the Interstate in charge of the safety car.

Many school children at Scottsburg and other towns along the route visited the "exhibit" car. Stops were made at all cities and towns along the line.

Portland Theaters Pay Railway Fares

All inbound street cars and buses of the Portland Electric Power Company, Portland, Ore., were chartered between 6:30 and 7:30 on the night of Aug. 19 by the West Coast Theaters, Inc., in celebration of its fall season opening, known as the "Greater Movie Season." Five of the leading theaters in the city are included in the combine. Conductors on the street cars helped to spread the publicity by saying to each patron who entered the car: "This ride is through the courtesy of the West Coast Theaters, Inc. It is the night of their grand opening."

Price Put on Use of Houston Tracks

An agreement has been reached between the City Council of Houston, Tex., and the electric railway interests by which a franchise will be granted allowing the Houston North Shore Electric Railway, operating an interurban between Houston and Baytown, to pay the Houston Electric Company 18 cents per car-mile for the use of the latter's tracks inside the city limits. The cars of the Houston North Shore Electric Railway will use the tracks of the Houston Electric Company on a number of streets.

Higher Fare Sought in Beacon and Fishkill

The Fishkill Electric Railway filed a petition on Sept. 16 with the Public Service Commission for permission to increase fares on its lines in Beacon and Fishkill and in the surrounding territory to 10 cents with twelve tokens for $1. With the petition is filed a proposed rate schedule, establishing two zones. Strip tickets of twelve coupons each will be sold for $1. Commutation tickets good for 54 trips, for use during the calendar month indicated on the ticket, will be sold for $6. School tickets for those under seventeen years of age and attending school will be sold in strips of ten in Zone 1 and Beacon for 70 cents and in Zone 2 for 50 cents.

The petition alleges that its present fare is insufficient to yield a reasonable compensation for the service rendered, is unjust and unreasonably low, and does not allow a reasonable return on the value of its property used in the public service. It further alleges that the company is unable to meet its assessment of $40,000 as its proportionate share of the paving cost of Main Street from Beekman to Herbert Street in Beacon, which was authorized at a special election of the voters of Beacon in August, 1927. A public hearing will be held on this petition.

Certain Rate Reductions in Seattle

Reduced rates of fare on rides which involve transfers from one system to the other went into effect on Sept. 16 on the Seattle & Rainier Valley Railway Line and the Seattle Municipal Railway of Seattle, Wash. The Rainier company has formally notified the City Council that it accepted the provisions of a recent ordinance which provided for issuance of transfers on either line to the other on an 8½-cent token. At present transfers are given only on a 10-cent fare. In return for this concession, the City Council has provided by ordinance that the railway be credited with 1⅞ cents on its delinquent franchise tax for each transfer from its lines accepted by the municipal system. The company is in arrears a total of $77,135 in its franchise tax.

Plans of the Seattle Municipal Railway to extend its service in the Rainier Valley by operating the Empire Way buses over Renton Avenue from Henderson Street to Ryan Street brought a protest from the Rainier Valley Line, which informed the Council by letter of its intention to extend its Rainier Beach bus route on Renton Avenue.

$27,765 for Efficiency in Brooklyn

For efficient performance of their duties during the year ended July 31, 1927, 1,026 trainmen of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., shared in a bonus totaling $27,765. The awards were based upon the efficiency ratings of each conductor and trainman made at periodic inspections of their work. Individual bonuses ranged in amount from $50 to $12.50. Because there were in all more than 200 trainmen whose inspection records gave them 100 per cent efficiency ratings for the year, a total of 233 bonuses of $50 each were awarded instead of 100 such bonuses specified in the bulletin.

Massachusetts Property Enlarges Service

The Union Street Railway, New Bedford, Mass., has been authorized by the Public Utilities Department to take over some of the service that the New Bedford & Onset Street Railway will discontinue on Sept. 30. It will extend its tracks into Massapoisett and it is authorized to construct, maintain and operate a street railway in New Bedford, Fairhaven, Dartmouth and Westport.

Free Rides in Denver

Howard S. Robertson, president of the Denver Tramway, Denver, Col., permitted all boys and girls under eighteen years of age to ride the cars free, between the hours of 1 and 5 p.m., on Aug. 31, the day that Colonel Lindbergh visited Denver. He said he wanted every child in Denver to see the Colonel.

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Recent Bus Developments

Southern Pacific Opens Bus Service

A bus service was to be started on Sept. 20 by the Southern Pacific Railroad in conjunction with its steam and electric lines. This announcement was made by T. B. Wilson, vice-president and general manager of the newly organized Southern Pacific Motor Transport Company, a California corporation, which was granted a permit to operate in Oregon two months ago.

The new service will extend from Portland to Salem, Eugene, Roseburg and Ashland, and from Portland to points in other directions, and will include an interurban run connecting Portland, Lake Oswego and other resorts. About 30 buses will be used at first, with probably 45 in use within a month.

It is stated that plans are complete for replacing railway service in the cities of Salem and Eugene with the new buses. The Southern Pacific Motor Transport Company has acquired the traction lines in these two places.

Detroit Coaches Start Passengers on Air Voyages

The Department of Street Railways, Detroit, Mich., is operating daily its Graham Brothers parlor coach from the Detroit hotels to the Ford Airport, 11½ miles away. At that point passengers board Stout air lines for aerial tours or trips to other cities. Regular two-hour coach service was instituted Sept. 1, with a fare of 25 cents each way.

Acquires Perth Amboy Bus Lines

The Public Service Transportation Company, subsidiary of the Public Service Railway, Newark, N. J., acquired three important bus lines in the vicinity of Perth Amboy. One runs from Perth Amboy to Carteret via Woodbridge, another is the Perth Amboy-Rahway line, and the third is the Fords-Woodbridge-Iselin line. Purchase was made from one corporation and several individuals. Twenty-two permits and 26 buses were involved in the transaction. The purchase price was withheld.

Extension of Bus Route in Rome May Mean Profits

The Public Service Commission recently granted the petition of the New York State Railways for the discontinuance of railway service on North James Street, Rome, from Thomas Street to Linden Street, for a period of one year only.

A bus line paralleling this route is operated by the Utica Railway Co-Ordinated Bus Line, Inc., which extends into territory not now served by street cars. The railroad company does not wish to abandon the line and remove the tracks until bus service has proved successful. The city of Rome has consented to discontinuance of street car service and the substitution of bus service for five years.

The evidence showed that the street car line in Rome has been operated at a loss, but the railway believes that by the extension of the bus route and other economies additional revenue will result and prove profitable. Repairs to existing street pavements will be made.

Bus Rehearings in New York State Denied

The New York Public Service Commission denied the petitions of the cities of Albany, Troy and Cohoes on Sept. 12 for a rehearing on the application of the Capitol District Transportation Company, Inc., for increased passenger fares on its bus lines in Cohoes, Troy, Albany, Rensselaer and the town of Guilderland. Insufficient reasons were shown why the rehearing should be held.

Express Bus Service Proposed in Washington

The Washington Rapid Transit Company, Washington, D. C., petitioned the Public Utilities Commission on Sept. 18 for permission to establish new routes for express or limited bus service, which would be in addition to the present local service. The routes over which the limited buses would run, however, are slightly different from the regular routes. The use of two streets is contemplated, the buses using less congested streets, returning from the main trip during rush hours to facilitate rapid movement. At the start approximately six buses will be scheduled in the limited service.

Citizen's Peace Threatens School Attendance in Evanston

Application for a permanent injunction filed on Sept. 11 before Circuit Judge Otto Kerner to restrain the Evanston Railway from operating buses over a certain portion of Grant Street in Evanston, Ill., is seriously threatening attendance at the Evanston Township High School, on the far west side of the city. The school reopened the morning the suit was called for hearing with a heavy enrollment. A majority of the students are dependent upon the railway bus service and Grant Street is the only thoroughfare which reaches the school. A citizen residing on Grant Street obtained a temporary injunction several weeks ago on the grounds that the passing buses destroy the peace and quiet of his home. Now he is seeking an order permanently to restrain their operation on this street.

Buses on Meriden-Middletown Route

The Connecticut Company has lately decided to change over to bus service on the Meriden-Middletown line, and has petitioned the Public Utilities Commission for such authority. The date for the public hearing has not been specified.

Morris County Planning Change Over

Otto G. Schultz, general manager of the Morris County Traction Company, is on a trip, during which he will meet with the bondholders' committee of the company at Pittsburgh to arrange for the substitution of buses for trolleys. He planned this trip following the favorable decision on Sept. 3 of the Public Utility Commission on the matter of the substitution.

It is expected that buses will be ready to operate within thirty days after the order is placed and this will mean shortly after Oct. 2. While Mr. Schultz desires to secure all new buses of the type now in use and giving satisfactory service on the Springfield-Elizabeth line, it may be that arrangements will be made with the Public Service Corporation for the use of some of its buses. The new buses would cost about $350,000.

The railway is in the hands of receivers. It is proposed to offer the assets under foreclosure sale in four lots. One will be the right to operate bus lines, another will include the right to operate railway lines and other rights under this franchise, the third lot will comprise the real estate and the fourth will include the personal property and equipment.

In its decision the Public Utility Commission reserved the right to issue an order at some future time concerning the removal of the poles and overhead lines and also the replacement of the pavement when the tracks are taken up. This, Mr. Schultz said, was due to the fact that the company did not ask to abandon these and will not do so until after the bus lines are in routine operation. Then the commission will be requested to grant permission for the removal of these rails. Both buses and cars will be run for a time until the bus routes are thoroughly worked out and the machines running satisfactorily. In the event that the travel by bus proves more popular than by trolley car, the company will be prepared to increase its service.

Just how the change will work out in relation to the direct line running into Newark has not yet been decided. Now the Morris County cars operate over tracks of the Public Service Railway through special arrangement. If

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the bus route is substituted there, the buses will be run as an express line direct from the terminal of the Morris County line.

Express Service in Detroit

The plans for express service as worked out by the Department of Street Railways in Detroit and put in operation on Jefferson Avenue on Sunday, Sept. 18, have proved successful after the first few days of operation and, according to General Manager Del A. Smith of the Detroit Municipal Railways, the express system is a distinct improvement over the old system. The cars are run express. Between express stops local buses, known as transfer buses, pick up passengers and deposit them at the nearest express stop. These buses double back between express stops.

At a meeting of the Street Railway Commission after the Jefferson Avenue express service had been started it was announced that a number of other improvements were contemplated. These include the synchronization of traffic lights on Jefferson Avenue, which are now operated manually; facilitation of the movement of cars in the downtown loop, extension of the local bus service to the downtown district and the installation of windows in the loading stations. The commission also authorized the purchase of 50 instruments for buses to record the time of stops, the speed and mileage.

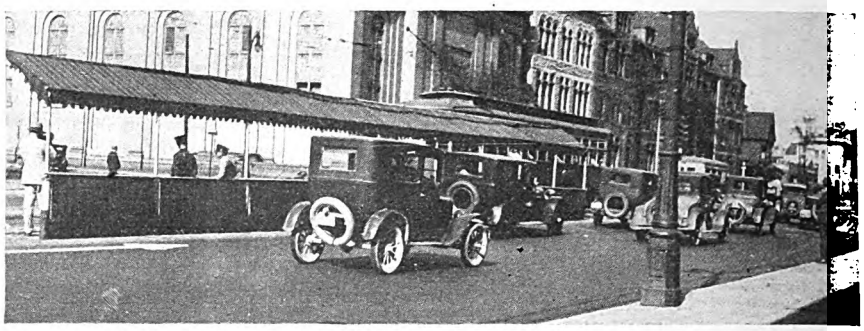
It is anticipated that express service will also be established on Grand River Avenue in the near future. Ultimately, it is planned to extend the service throughout the entire Jefferson line and to run a modified express service even through the downtown loop. The Jefferson line will probably be extended about 2½ miles beyond the city limit into the village of Grosse Pointe.

The Miller-Schorn system is applied experimentally to the Jefferson Avenue line. The total route is 6.8 miles. The express portion from Antoine to Lillibridge, 4.3 miles, is covered at an average speed of 18.4 miles. The maximum running speed is 27 miles. The stations are at intervals of 0.9 miles, located at Antoine, Chene, Grand Boulevard, Parker, Parkview, Lillibridge. Express zones are equipped with orange and black awnings and splash aprons. In the express section transfer buses pick up passengers at the curb and deliver them to the express zones. The present zones are being used temporarily. Loading stations to be located between tracks with sub-walks are being considered by the city.

A three weeks publicity campaign with posters and newspaper co-operation educated the public for the change. There were three days of preliminary training for motormen, conductors and special guards for express stations. Police traffic officers were supplied for automobile control so as to approximate the condition expected when the cascaded traffic lights and the stations with sub-walks are installed between the tracks.

Traffic Director Gustave C. Schink is enthusiastic over the change. He says auto traffic has been speeded 40 to 60 per cent and the street capacity proportionately increased. Newspapers report the system has public approval.

Mr. Smith states many letters of approval have been received from patrons and only two criticisms from 60,000 daily passengers on the Jefferson line after four days operation. Improvement associations of other Detroit sections are requesting similar service. According to Mr. Smith the soundness of the plan has been definitely established, but it is too early to state the exact operating costs.



Sheltered express stations are spaced at 1-mile intervals at Detroit

Contends Bus Routes in Brooklyn Not Needed

Objections to the granting of a certificate to the Equitable Coach Company by the Board of Estimate to operate buses in Manhattan, Brooklyn and Queens were filed with the Transit Commission on Sept. 21 by Clarence J. Shearn of counsel for the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad, Brooklyn, N. Y. A protest was also made by the New York Railways Corporation through William Wallace of the law firm of Chadbourne, Stanchfield & Levy as counsel. A hearing will be held on Sept. 26.

Mr. Shearn said the Equitable company in its application failed to say anything about its financial condition or how it proposed to finance the operation of its bus routes. He also questioned the necessity for the different bus routes which the board authorized. He added that the Brooklyn-Manhattan Transit Corporation was prepared to meet the contentions to disprove the necessity of the bus routes in Brooklyn.

Bus Replaces Rail Line in Gadsden

Bus service has replaced railway service on the North Fourth Street and Ewing Avenue line in Gadsden, Ala. The Alabama Power Company is operating as an experiment a 25-passenger bus on the short crosstown line.

Buses run local and cars express in new service on Jefferson Avenue, Detroit

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Financial *and* Corporate

Brooklyn Case Appealed

Brooklyn-Manhattan Transit Corporation secures order to require commission to submit records of bond case for review

THE New York Rapid Transit Corporation, a subsidiary of the B.-M.T., obtained on Sept. 21 from Supreme Court Justice Phoenix Ingraham an order in certiorari proceedings requiring the Transit Commission to submit for judicial review all papers and records in connection with the company's application for permission to sell $20,000,000 in refunding mortgage 5 per cent bonds to pay for new cars and for other purposes. The New York Rapid Transit Corporation proposed to sell these bonds to the B.-M. T. at 80, or for $16,000,000. The commission on Aug. last denied the application on advice of Samuel Untermyer, its special counsel.

In its petition the New York Rapid Transit Corporation attacks statements made by Mr. Untermyer during the recent transit inquiry hearings and asserts that the commission in denying its application acted merely upon the advice of Mr. Untermyer without requiring proof of his assertions. The decision of the commission, the petition alleges, was erroneous because the commission denied consent to the issuance of the entire amount of the proposed issue of bonds, notwithstanding that Mr. Untermyer had consented to the issue of bonds at the price of 80 up to the amount of $3,467,000, the amount which the company desired to spend for purposes not covered by its contract with the city.

The commission, the petition charges, confused its functions as a regulatory body under the Public Service Commission act and its functions as an agent of the city under the contract between the city and the company. The commission, the petition continues, has assumed to use its powers as a regulatory body and to give consideration to the alleged effect on the amount the city would be required to pay the petitioner for debt discounts and expenses in case the petitioner should sell the bonds at 80 and the city should exercise its alleged right of recapture of the city-owned rapid transit lines operated by the petitioner.

The right of the city to recapture is questioned in the petition, which states that the city has not given the company the one year's notice required, as a condition precedent to the exercise of its alleged recapture right. The petition contends that the city is not now and will not be in a position to give such a notice or to exercise its alleged recapture rights until it constructs the Nassau Street subway, as provided in the contract.

The city has not indicated that it has any intention or desire to exercise its alleged right of recapture and to separate the city-owned and company-owned rapid transit lines of the B.-M. T. system and disrupt the service, the petition recites, unless statements of Mr. Untermyer, unsupported by any evidence or proof of his authority to make them, is accepted as an indication of city policy.

The commission erred, the petition recites, in giving consideration to Mr. Untermyer's statement that the petitioner is "a mere creature of the Brooklyn-Manhattan Transit Corporation, which proposes to take these bonds at 80 cents on the dollar." Exception also is taken to the statements attributed to Mr. Untermyer that "the parent company is both the seller and the buyer" and that "the parent company is selling the bonds to itself at a price and upon terms fixed by it."

Would Free Nashua Property from Tax Payments

The Public Service Commission has certified to the State Tax Commission that the Nashua Street Railway, Nashua, N. H., should be exempted from taxation for the year 1927, because the road failed to earn operating expenses through the year closing March 31.

Railway Property Not Included in Transfer

Commissioner Lunn held a hearing on Sept. 13 on the petition of the Eastern New York Utilities Corporation, Rensselaer, N. Y., and the Municipal Gas Company, Albany, for consent to transfer the gas and electric franchises, works and systems of the former to the latter. The petition alleges that this transfer is to be made on the basis of the net book value of the property transferred, plus or minus adjustments, the book value to be determined by the commission. The electric railroad property of the Eastern New York Utilities Corporation is not to be transferred.

Colorado Springs Rejects Railway Offer

After deliberating the matter for some time, the City Council of Colorado Springs, Col., on Sept. 13 answered that the city will not purchase the Colorado Springs & Interurban Railway. Buses have already supplanted some of the car lines in that city.

The railway made it plain to the city officials of Colorado Springs that it could not operate the street cars much longer unless there were more revenue; that regardless of the increased fare it was not making sufficient money to justify the continuance. It then offered the system to the city for $500,000, agreeing to accept half that amount in city bonds.

Day & Zimmermann Deal Approved

U.G.I. votes additional stock necessary to carry out plan first voted months ago

STOCKHOLDERS of the United Gas Improvement Company at a special meeting on Sept. 15 voted to increase the authorized capital stock of the company from 2,036,528 shares, par $50, to 2,130,088 shares; the additional shares to be used in the acquisition of the engineering and public utility firm of Day & Zimmermann, Inc., of Philadelphia, and stock of several gas companies operating in Connecticut.

Shareholders of the company also voted to increase the number of directors to twelve, including the president, who is an ex officio member of the board. Three new directors were elected as follows:

Thomas S. Gates, of Drexel & Company and J. P. Morgan & Company; Charles Day, of Day & Zimmermann, Inc., and Morris W. Stroud, president of the American Gas Company.

After approving the increase in capitalization, the stockholders authorized the board of directors to issue 53,082 shares in exchange and payment for 58,980 shares of the no-par common stock of Day & Zimmermann, Inc., 2,017 shares in exchange and payment for a like number of shares of the no-par preferred stock of Day & Zimmermann, payment for 3,656 shares of the com- Inc., and 38,461 shares in exchange and mon stock of the Hartford City Light Company and for 204,481 shares of the no-par common stock and 8,361 shares of the no-par preferred stock of the Connecticut Gas & Coke Securities Company.

Directors of the company convened immediately after adjournment of the stockholders' meeting and approved a resolution providing for the exchange of stock, as authorized by the shareholders.

Concerning the exchange of shares as arranged with the Day & Zimmermann concern, a statement issued by the management of the United Gas Improvement Company said:

> The exchange of stock with Day & Zimmermann, Inc., will give the U.G.I. a controlling interest in that widely known public-utility company. Day & Zimmermann, Inc., is interested in and operates properties in fifteen States, serving 935 communities with a population of 2,369,000. Among the largest properties controlled and managed by Day & Zimmermann are the National Public Service Corporation, the General Public Utilities Company and the Southern Ohio Public Service Company.

Kansas Road Sold Under Foreclosure

The Kansas City, Kaw Valley & Western Railway, an interurban operating from Kansas City to Lawrence, Kans., was sold to the first mortgage bondholders for $300,000 at a recent special master's sale. The bid presented

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by George W. York, Cleveland, chairman of the first mortgage bondholders' protective committee, included a cash payment of $50,000 specified in the sale order made by Judge John C. Pollack, in federal court. Mr. York was the only bidder. A valuation of $1,500,000 had been placed on the line.

The interurban has been in receivership since July, 1924, but continued to operate during that period.

Mr. York said that approval of the sale would be asked of Judge Pollack promptly and a general plan for the reorganization would be announced as soon as the approval was given. The line will continue to operate unchanged until that order has been approved and the reorganization completed.

Talk of Akron-Youngstown Merger

It is stated that a discussion that may lead to a consolidation of the Northern Ohio Power Company and the Penn-Ohio Power system has been resumed. Practical control of the Penn-Ohio system rests with the American Superpower Corporation, through holdings in the Penn-Ohio Securities Corporation. Interests friendly to American Superpower control Northern Ohio. Properties of the companies in the reported merger are adjacent. Northern Ohio serves Akron and vicinity in a radius of 30 miles. Penn-Ohio has headquarters at Youngstown, about 60 miles east of Akron, and sends electricity as far as Pennsylvania. Connections through other lines make a superpower system extending from Cleveland to Akron and Canton in Ohio, Windsor in West Virginia, Charleroi in Pennsylvania, and back to Youngstown and to Cleveland.

$900,000 Needed to Complete St. Louis Reorganization

The St. Louis Public Service Company will require at least another $900,000 in addition to the cash now available to complete the reorganiza- of the United Railways, St. Louis, Mo. This estimate was made by W. DeW. H. Bradley, secretary of the company, in a letter sent to the Missouri Public Service Commission, which has the reorganization plan under consideration.

The cash requirements of the new company include $2,000,000 to pay off Suburban bonds, $2,937,000 for cash settlement with holders of St. Louis Transit Company bonds, $440,550 for accrued interest and $1,130,745 for accruing preferred stock dividends, a grand total of $6,508,295. Cash available will be $1,040,187 from common stock sold to holders of transit company bonds, $1,041,720 from common stock sold holders of other securities of old company, $3,000,000 cash estimated to be sum receiver will turn over to new company and $276,280 from sundry items, a total of $5,662,937. The estimate of requirements did not include any of the actual expenses of reorganization. These expenses are expected to exceed $800,000, while in addition the reorganization committee advanced $409,754 to the St. Louis Bus Company for 35 buses.

Union Traction Lines Carry 11,800,810 Passengers

The revenue from railway operation for 1926 of the Union Traction Company of Indiana, Anderson, Ind., was $3,060,465, compared with $2,939,182 for 1925. Expenses of railway operation were $2,566,742, compared with $2,541,873. Gross income for 1926, being the income after operating expenses and taxes, but before charges for bond interest and other fixed charges, was $408,625, compared with $324,787. These facts were contained in the annual report of the company, submitted by the receiver to the Madison Circuit Court in Indiana.

In operating expenses for the year are included $571,623 for maintenance of way and structures and $351,560 for maintenance of equipment, making the total sum charged in these directions for maintenance of the property $923,223. This is equal to 30 per cent of the gross railway operating revenue for the year.

The 1926 account for additions and betterments shows debits of $139,627 and credits of $164,687, making the balance for the year a credit of $25.061. The credits arose principally out of the removal of three railway lines at Muncie and the sale to the Indianapolis Street Railway of part of the Broad Ripple line at Indianapolis. This amount is exclu-

INCOME ACCOUNT OF THE UNION TRACTION COMPANY FOR THE YEAR 1926

Revenue from transportation:	
Passenger	$2,046,994
Baggage	6,285
Parlor, chair and special car	10,003
Mail	5,565
Express	131,502
Milk	14,171
Freight and switching	696,466
Total	$2,910,990
Revenue from operation other than transportation:	
Station and car privileges	$15,153
Parcel room receipts	120
Car service and storage	544
Rent of tracks and terminals	2,826
Rent of equipment	9,589
Rent of buildings and other property	13,589
Power	107,302
Miscellaneous	348
Total	$149,475
Total operating revenue	$3,060,465
Operating expenses:	
Way and structures	571,623
Equipment	351,599
Power	512,676
Conducting transportation	737,559
Traffic	41,180
General and miscellaneous	352,071
Total operating expenses	$2,566,741
Net operating revenue	493,723
Taxes	110,000
Net operating revenue less taxes	$383,723
Other income	24,901
Gross income	$408,624

TRAFFIC STATISTICS OF THE UNION TRACTION COMPANY

(Year ended Dec. 31, 1926)

Passengers carried, interurban lines	4,174,308
Passengers carried, city lines	7,626,502
Total passengers carried	11,800,810
Freight handled, tons	268,644
Express handled, tons	10,976
Mileage of cars, interurban lines, miles	6,745,003
Mileage of cars, city lines, miles	1,770,914
Total mileage of cars, miles	8,515,917

Conspectus of Indexes for September, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Sept. 1927 **7.53**	Aug. 1927 **7.52**	Sept. 1926 **7.36**	Sept. 1927 **7.53**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Sept. 1927 **141.6**	Aug. 1927 **142.1**	Sept. 1926 **151.2**	Sept. 1920 **247.5**	Sept. 1927 **141.6**
Electric Railway Wages* 1913 = 100	Sept. 1927 **227.8**	Aug. 1927 **227.8**	Sept. 1926 **226.1**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Sept. 1927 **199.4**	Aug. 1927 **200.9**	Sept. 1926 **203.2**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Sept. 1927 **203.6**	Aug. 1927 **205.5**	Sept. 1926 **208.3**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Aug. 1927 **146.6**	July 1927 **144.6**	Aug. 1926 **149.2**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Sept. 1 1927 **12.90**	Aug. 1 1927 **12.58**	Sept. 1 1926 **12.70**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Aug. 1927 **152.4**	July 1927 **153.4**	Aug. 1926 **155.7**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Aug. 1927 **162.0**	July 1927 **162.2**	Aug. 1926 **165.3**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Aug. 31 1927 **3.196**	July 31 1927 **3.142**	Aug 31 1926 **3.542**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	Aug. 1927 **17.92**	July 1927 **18.37**	Aug. 1926 **17.63**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	Aug. 1927 1448	July 1927 1503	Aug. 1926 1512	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**43.76**	**37.90**	**39.26**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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STATEMENT OF EARNINGS OF VARIOUS DIVISIONS OF UNION TRACTION COMPANY

	Total Operating Revenue	Total Operating Expenses	Taxes	Other Income	Gross Income
Union Traction	$1,423,413	$1,257,537	$45,529	$9,157	$129,499
Indianapolis Northern	784,114	597,881	23,232	11,748	174748
Muncie, Hartford & Fort Wayne	274,211	221,610	10,384	1,196	43,414
Muncie-Portland	105,069	84,102	5,951	400	15,416
Indianapolis, New Castle and Eastern	308,408	230,856	10,065	1,460	68,948
Muncie-Union City	84,976	88,087	8,195	490	*10,814
Marion-Wabash	59,414	61,017	4,444	344	*5,703
Anderson-Middletown	20,856	25,647	2,200	106	*6,884
Total	$3,060,465	$2,566,741	$110,000	$24,901	$408,624

*Deficit.

sive of charges in 1926 for the purchase of buses and bus lines, amounting to $289,602 and also of charges of $26,029 for extensions of and betterments to the property of the Traction Light & Power Company, wholly owned by the Union Traction Company of Indiana. The principal debt item included in additions and betterments is $60,000, representing the purchase under a conditional sale contract of twenty freight box cars.

Buses were operated by the receiver during much of 1926 between Indianapolis and Peru, Indianapolis and Muncie, Indianapolis and Sheridan and Anderson and Marion, in the cities of Anderson and Muncie and at Fort Benjamin Harrison. Gross revenues for bus operation were $129,423 and operating expenses, taxes, interest and amortization charges were $268,288, making a deficit resulting from bus operation of $138,865, which includes $81,495 for depreciation and amortization.

The report mentions the record of the general safety board and department safety organizations in promoting safe and efficient operation, and to the cooperation shown and interest taken by employees generally in the endeavors made during the year to meet the difficult conditions confronting the company.

Operation of the Anderson-Middletown interurban line resulted in a deficit of $6,884 for the year. This deficit is greater by $2,628 than that of 1925, as shown in the receiver's report for that year. Operation of the Muncie-Union City line resulted in a deficit of $10,814, being $2,896 greater than that shown for 1925. Operation of the Marion-Wabash interurban line resulted in a deficit of $5,703, which is $962 less than that shown for 1925. Further consideration is being given to the question of the course which should be taken with respect to these three interurban lines and certain non-paying street railway lines.

Some facts are also given on the Traction Light & Power Company, the sales of the Broad Ripple lines, the Broad Ripple Traction Company's bonds and the Traction Land Company, a subsidiary of the Union Traction Company of Indiana.

The segregation of earnings and expenses of the respective lines subject to the liens of the principal mortgages and also of the lines leased to the Union Traction Company of Indiana was undertaken, and the earnings and expenses so segregated for the year are shown, tentatively and subject to revision.

ROUTE MILEAGE OF THE UNION TRACTION COMPANY

Lines owned:	Miles
Muncie-Anderson-Indianapolis	56½
Anderson-Marion-Wabash	53½
Alexandria-Elwood-Tipton	20
Indianapolis-Kokomo-Logansport	80
Kokomo-Peru	19½
Muncie-Union City	33
Anderson-Middletown	9½
Anderson City Lines	10
Marion City Lines	14½
Muncie City Lines	12½
Total	309
Lines Leased:	
Muncie-Hartford City-Bluffton	42
Indianapolis-New Castle-Muncie	62½
Muncie-Portland	32
	136½
Total	445½

Would Abandon Illinois Interurban

The Illinois Power & Light Corporation has filed a petition to abandon its interurban line between Danville and Catlin, Ill. With suspension of its operation traffic between the two terminals will be handled by the Allerton bus line, which up to this time has been forbidden to handle passenger traffic in the territory. The traction line has been a losing proposition for more than a year.

Local Interests Take Over Wichita Property

Passage of control of the transportation business in Wichita, Kan., from the Illinois Power & Light Company to a $3,000,000 Wichita concern is noted in the organization of a new company, details of which were completed on Sept. 14 at a meeting of the Wichita Transportation Company's directors and officers.

The meeting marked completion of negotiations and organization work through which ownership in the Wichita traction systems passes from the Illinois Power & Light Company to a group of Wichita capitalists.

Officers of the company are: H. V. Wheeler, banker, president; R. B. Campbell, president of the Arkansas Valley Interurban Company, vice-president; R. C. Clevenger, banker, secretary-treasurer, and Robert C. Foulston, former city attorney, counselor.

All stock of the new company, formed to operate the transportation facilities of the city, including both bus lines and car lines, is owned by local people in Wichita.

Seeks Receiver for Fitchburg Road

A bill in equity against the Fitchburg & Leominster Street Railway, Fitchburg, Mass., seeking appointment of a receiver was filed in the Suffolk County Superior Court on Sept. 21 by Charles S. Cummings of Boston, who asks to have the company ordered to pay interest on $5,000 in bonds he holds and also to have it restrained from payment on unsecured notes until the bonds are paid in full. E. W. Baker, president, looks upon the action as entirely unwarranted and characterizes Mr. Cummings' statements as not being in accordance with the facts of the case.

Auburn Abandonment Authorized

The Public Service Commission granted on Sept. 15 the petitions of the Auburn & Syracuse Electric Railroad for permission to abandon all of its car lines in the city of Auburn and two lines forming part of its system in the towns of Owasco and Fleming. The abandonment does not affect the interurban lines of the company and these are to be continued in operation. Hearings were held on these applications by Commissioner Lunn in Auburn on Aug. 2 and Aug. 20. In his memorandum accompanying the order he said that the representatives of the city practically conceded that local trolley service could no longer be carried on profitably in Auburn and the Common Council has gone to the extent of soliciting bids for bus service to supplant the trolleys. The order of the commission becomes effective on Oct. 15, 1927.

Binghamton Sale Ordered

The properties of the Binghamton Railway, Binghamton, N. Y., which include a $1,000,000 electric lighting plant at Endicott, will be sold under mortgage foreclosure to the highest bidder on Dec. 1 next, according to an order issued by Federal Judge Frank Cooper at Elmira.

Bidding must start at $2,300,000 "upset price," according to the court order. The properties were appraised some years ago at $3,000,000 and the debts aggregate that sum.

Market Street Railway Deal Rumored

Plans are said to be underway for an offer of exchange of Standard Gas & Electric Company stock for the shares of the Market Street Railway, San Francisco, Cal. It is known that the subject has been discussed more or less officially but it is stated the actual working out of the plan will take some time. The Byllesby organization obtained the privately owned railway in San Francisco when the United Railways Investment Company was acquired some time ago.

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Personal Items

J. F. Egolf with Western United Company

John F. Egolf, former general manager of the Aurora, Elgin & Fox River Electric Company and lately general manager of the Chicago, North Shore & Milwaukee Railroad, has been appointed operating vice-president of the Western United Gas & Electric Company, effective on Nov. 1. At the same time officials of the Western United announced that the agreement between the Western United and the General Engineering & Management Company, under which the latter concern has been operating and managing the properties of the former, would be terminated on Nov. 1.

The General Engineering succeeded Stone & Webster as operator of the Western United property on March 1, 1926, shortly after controlling interest had been acquired by E. H. Rollin & Sons and A. E. Fitkin & Company. Later the Fitkin interests were acquired by the Rollins interests, which now own practically all of the class B common of the Western United Corporation, which in turn owns all the common stock of the Western United Gas & Electric.

B. P. Alschuler, vice-president of the Western United, announced that after Nov. 1 operation of all affairs of the company will be in the hands of its own executives. The change will affect very few men now engaged in the executive offices.

Mr. Egolf will succeed B. E. Waltz, who was elected when the General Engineering came into the property and who was elected through that corporation. Mr. Egolf is well known in the railway field. He began his railroad career as a conductor on the street railway at Columbus, Ohio, in 1902 and from that position rose to assistant superintendent of the Ohio Electric Railway. Later he became general manager of the Springfield & Xenia Railway. He was president of the Illinois Electric Railway Association in 1925.

E. E. Whiting, Trustee at Boston

Edward E. Whiting, who writes the Whiting column in the Boston *Herald*, has been appointed by Governor Fuller to the position of trustee of the Boston Elevated Railway, Boston, Mass., to succeed Andrew Marshall, resigned. Mr. Whiting was born in Springfield, Mass., in 1875. He studied three years at Harvard College. He became interested in journalism through his father, who was editor of the Springfield *Republican*. Edward E. Whiting has been connected with Boston newspapers since 1903. He was at one time editor of the defunct Boston *Evening Record*, and has been on the Boston *Herald* staff since 1921. In recent years he has written much on political matters. He succeeds Edward Marshall, who in turn succeeded James F. Jackson.

Ross Schram with Twin Coach Corporation

Ross Schram, whose name is indelibly written in the annals of transportation history in Detroit, Mich., is now vice-president in charge of sales of the Twin Coach Corporation, Kent, Ohio. He has also been elected a director of the corporation. The announcement of his appointment was made by Frank R. Fageol, president.

In 1925 Mr. Schram resigned from the

©O. M. Hayes & Co., Detroit, Mich.
Ross Schram

Detroit Municipal Railway after many years service. He, with Clarence E. Wilcox, former corporation counsel for the city of Detroit and later head of the claims department of the Department of Street Railways, became asociated with Senator Couzens in the Couzens Ice Machine Company. It was in 1924 that Ross Schram succeeded William B. Mayo as general manager of the Detroit Department of Street Railways. He was well known at the time, having served as secretary to Mayor-elect James Couzens in 1918. Later, when construction was started on the municipal railway system, Mr. Schram was made secretary of the Street Railway Commission. When on Dec. 23, 1921, he was made assistant general manager of the Detroit Municipal Railway he knew the problems confronting the railway management and was a valuable aid to the late Joseph S. Goodwin, then general manager. Upon the death of Mr. Goodwin, Mr. Mayo resigned his place on the Street Railway Commission to become general manager and Mr. Schram continued as assistant general manager. In reality he assumed full responsibility of a 400-mile municipal system whose early history had played a conspicuous part in the making of the present-day Detroit. Further details of Mr. Schram's rôle were given in the ELECTRIC RAILWAY JOURNAL, issue of July 12, 1924, page 71.

Mr. Schram was born in Battle Creek, Mich., in September, 1888. He was graduated from the Detroit University School. At one time he was connected with the Charles H. Fuller Company, the J. Walter Thompson Company and the Packard Motor Car Company.

A. W. Stace Directs Michigan Committee on Utility Information

Arthur W. Stace, Grand Rapids, has been appointed director of the Michigan Committee on Public Utility Information with offices in Ann Arbor, Mich. The committee was formed in 1920 to provide responsible information on utility operation and to promote public understanding. Through its bureau speakers are furnished for clubs and schools.

During the past four years Mr. Stace has been engaged in writing articles concerning Michigan, her resources and possibilities. For many years he was identified with the Grand Rapids *Press*, leaving the post of managing editor there to become special writer for the Booth newspapers, his particular field being constructive editorial research and studies looking to the solving of Michigan problems and the development of Michigan's natural resources.

Mr. Stace was the first president of the Michigan Associated Press Editorial association. He was graduated from Notre Dame University. In his new position he succeeds Alfred Fischer, who resigned on April 1, to become affiliated with the Semet-Solvay Engineering Corporation, New York.

J. R. Blackhall Made North Shore Manager

J. R. Blackhall, vice-president and general manager of the Chicago & Joliet Electric Railway, has been appointed general manager of the Chicago, North Shore & Milwaukee Railroad at Highwood, Ill., succeeding John F. Egolf, who has returned to the Western United Gas and Electric properties as manager. No successor to Mr. Blackhall has been named so that he will divide his time between Joliet and Chicago until the Chicago & Joliet appoints a manager. Mr. Blackhall was born on Nov. 16, 1869, in a little French community named Caraquet, in New Brunswick, Canada. He left home when he was fifteen years old, and after working in several different places in Canada, he went to Portland, Me., in 1889. In the spring of 1891 he entered railway work with the Woodbridge & Turner Engineering Company, New York, which had taken a sub-contract under the Thomson-Houston Company, then engaged in electrifying the Deering branch of the Portland Railroad. A few months after the Woodbridge & Turner Engineering Company com-

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pleted its work at Portland the company employed Mr. Blackhall on the construction of the electric railway extending from Buffalo to Tonawanda along the Lake. He was finally promoted to the position of superintendent of the road.

Subsequently Mr. Blackhall served the Woodbridge & Turner Company in connection with the electrification of the horse car lines in Providence, R. I., the construction of the Westbrook branch of the Portland (Maine) Railway, the building of the Scranton-Moosic line, the electrification of the mule lines in Chester, Pa., the installation of an electric scenic line on Briganteen Island, N. Y., the electrification of the lines in Poughkeepsie, N. Y., and the construction of the independent telephone system at Mount Vernon, N. Y.

After leaving the Woodbridge & Turner Company, Mr. Blackhall constructed an overhead line connecting the new power plant with the old system in Wilkes-Barre, Pa. He next became connected with the Portland (Maine) Railroad in charge of its electrical work and remained in Portland until the spring of 1900. He then secured a position with the American Railways, Philadelphia, on work at Bridgeton, N. J. He was next sent to Joliet by the American Railways in the capacity of electrical superintendent on the rebuilding of the local lines there and the construction of the interurban line to Chicago. Upon the completion of that work he served the American Railways in other places, returning to Joliet in January, 1904, to become manager of the Chicago & Joliet Electric Railway.

George D. Powell at Terre Haute

The appointment of George D. Powell as division engineer at Terre Haute, Ind., of the Terre Haute, Indianapolis & Eastern Traction Company is seen in an official order sent out by G. O. Nicolai of the company. Mr. Powell will be engineer of maintenance of way with supervision of all tracks, buildings and grounds of the division. He was with the Union Traction Company of Indiana before going to Terre Haute in 1926 as assistant to the late W. F. Graves.

G. L. Lederer has been appointed local superintendent of the railway system of the Milwaukee Electric Railway & Light Company in Racine, Wis., succeeding the late A. W. Weyker.

W. J. Carr has been appointed a member of the California Railroad Commission to fill the vacancy caused by the death of Harley W. Brundige. Mr. Carr is a well-known local attorney and former State Senator from Los Angeles.

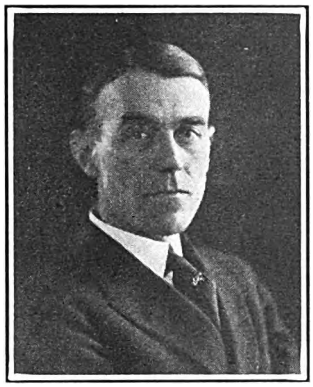
J. L. Billingsley is superintendent of the newly organized Southern Pacific Motor Transport Company, a California corporation with a permit to operate buses in Oregon. Mr. Billingsley has been superintendent of the Southern Pacific city railway lines in Salem and Eugene for the past fifteen years. His headquarters will be in Salem.

OBITUARY

Frank C. Wight

Frank C. Wight, editor of *Engineering News-Record*, one of the McGraw-Hill publications, died at his home in Summit, N. J., Sept. 18. He had been ill for only a week.

Mr. Wight was a man of brilliant attainments and remarkably broad understanding and sympathies. On these qualities and on his great administrative talents was based his success in his chosen vocation. He worked both rapidly and surely, and was incessantly active throughout his career. As an authority on reinforced concrete, Mr. Wight had contributed largely to the advancement of the art. Other subjects had also commanded his major attention during the past years, studies of the Mississippi River flood problem and traffic control among them. He was a member of Secretary Hoover's Committee on Street and Highway Safety when that body was first organized.



Frank C. Wight

Mr. Wight entered technical journalism in December, 1906, as associate editor of *Engineering News*. For six years his main assignments were in the fields of concrete, general construction and river and harbor work. In 1913 he was promoted to the managing editorship of *Engineering News*, a position which he held until *Engineering News* and *Engineering Record* were consolidated in 1917. Four years later he became managing editor of the consolidated journal, and on Jan. 1, 1924, was made editor of *Engineering News-Record*.

Mr. Wight was born in Washington, D. C., Feb. 26, 1882. He studied at Columbian (now George Washington) University and later at Cornell, where he received the degree of civil engineer in 1904. After graduation he spent three years in the office of the engineer of bridges of the District of Columbia, his previous summer vacations having been spent in the district surveyor's office.

He was a member of the American Society of Civil Engineers, the Cornell Society of Engineers, the American Concrete Institute and the Engineers Club. He had for years been active in the work of both the National Conference of Business Paper Editors and the New York Editorial Conference. Of the former organization he was president at the time of his death. He was a former chairman of the New York Editorial Conference.

A. E. Clifford

Arthur E. Clifford, business manager of *Automotive Industries*, published in Philadelphia, died suddenly at Cleveland, Ohio, on Sept. 20. For many years Mr. Clifford was connected with the McGraw Publishing Company and its successor, the McGraw-Hill Publishing Company, Inc., as business manager of the *American Electrician* and the *Electrical World*. In December, 1923, he resigned as assistant to President James H. McGraw to join the business staff of *Automotive Industries*, at that time published in New York.

In speaking of Mr. Clifford's death, Mr. McGraw said:

"Both capacity and courage were conspicuous characteristics of Arthur Clifford, whose earnest and devoted work will long be remembered by those for and with whom he labored. A large circle of friends in the McGraw-Hill Publishing Company and the United Publishers' Corporation, as well as in the other circles where he mingled, will miss him for his sterling personal and business qualities.

Mr. Clifford was born in New Hampshire 59 years ago.

Charles Barrett Attlesey, division superintendent at the Ninth Avenue depot of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died recently. With this property he served in various capacities until in 1918 he was promoted to the position of acting division superintendent. This was made permanent on Feb. 1, 1919. His work in Brooklyn was interrupted by a short period of service with the Public Service Corporation of New Jersey. Mr. Attlesey was 58 years old.

Henry Doerr, director of the Twin City Rapid Transit Company, Minneapolis, Minn., for the term expiring 1930, died Aug. 11 at his country home in Minnetonka. He was president of the Minneapolis Drug Company, director of the Northwestern National Bank and had been affiliated with other banking institutions. He was 74 years old.

G. T. Wiswell, president of the Wiswell Improved Railroad Crossing Company, Chicago, Ill., died on Aug. 8. He was prominent in the construction end of railroad work for more than 40 years. He was the organizer of the Roadmasters Association in Massachusetts and its first secretary. For the past ten years he gave his entire attention to his invention, the Wiswell improved railroad crossing, a noiseless, jarless, grooved flangeway patent. This invention was described in the Electric Railway Journal more than a year ago. One such pattern was recently installed on the Great Northern and Illinois Central crossing at Sioux City, Iowa.

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Manufactures and the Markets

Large Expenditures Planned by Virginia Company

Double-tracking of the Bay Shore Line to Ocean View on the Norfolk Division of the Virginia Electric & Power Company, for which $207,000 has been appropriated, is one of the many large rehabilitation and construction projects announced by officials for completion during the latter part of this year. Most of the right-of-way for the second track of the Bay Shore Line is clear and the company does not expect to have serious difficulty in completing it. With the construction of this second track, Ocean View, one of the most popular seaside resorts near the Virginia coast, will be furnished with a high-speed express service.

The company will spend in addition to the money appropriated for this work $36,000 for reinforcing and replacing in part the primary system of its 2,000-volt distributing lines. In Norfolk it will construct an underground conduit between Bank and Cove Streets to cost $5,300. Extensions of the power distribution system to Fentress and vicinity is estimated to cost $6,000. Plans include the double-tracking of portions of the Church Street line and laying of new track on Church Street between Eighteenth and 26th Streets, for which $60,000 has been allocated.

New business in Norfolk necessitates the extension of the power distribution system in various parts of the city, particularly in the suburbs. This project will cost about $150,000. Storage and garage facilities at Cove Street substation are being improved at a $30,000 expenditure. Sums of $52,000 and $53,000 respectively have been allocated to the construction of new transmission lines from the Reeves Avenue power station to Gilmerton and Newton Park. These lines will serve to strengthen the link between Norfolk and the high-tension line which runs from Gilmerton to Suffolk and permits interchange of power between Norfolk, Richmond, Petersburg and Roanoke Rapids (N. C.) generating stations. The rebuilding of an 11,000-volt transmission line will cost $20,000 and the installation of a transformer bank at the Reeves Avenue power station $15,000.

It is estimated that the company has spent in the territory of eastern Virginia and North Carolina $5,530,000 for extensions and improvements during the first six months of this year and that the program under way will cost $6,652,339. The largest project which the company has undertaken in Norfolk is the addition to the Reeves Avenue station, which has been under way for several months and which in order to put this generating plant in first class condition will absorb $2,500,000 of the construction funds during the last half of the year. The total cost of the Reeves Avenue additions is estimated at approximately $5,000,000. It is understood that plans for the North Carolina extension include the acquisition of property of the independent power companies in one or more of the smaller North Carolina communities. The local plants will be scrapped and their customers supplied by current brought in over the new transmission line. Construction last year of the transmission line through the Dismal Swamp to Edenton, Hartford and other North Carolina communities makes it possible for the company to branch out in that state at a relatively small expense, for the Dismal Swamp line is not used at its full capacity at present. At Richmond the company recently received a shipment of track steel to be used in completing the work on Main Street at Fourteenth, Eighteenth and 21st Streets.

Southern Utility Completes $100,000 Car Program

The last of seven cars built in the company owned plant of the Southern Public Utilities Company, Charlotte, N. C., has been completed. Seven cars were included in the construction program, estimated at $100,000, and all of the units have been placed in operation. Others, it is announced, will be built as needed. In the meantime the car building shop at the company's carhouse on East Boulevard will engage in construction of bodies for cars to be used in Charlotte and Winston-Salem. Each of the new cars recently turned out cost approximately $15,000. They are of the double-truck type, and are for one-man or two-man operation. The frames are of steel and the bodies are constructed of steel and wood. Each unit has a seating capacity of 40 passengers. Over-all length of each car is 38 ft. 3 in. and the width over all is 8 ft. 4 in. The height, from rail to top of car, is 11 ft. 6 in. All units are equipped with air brakes and numerous safety devices. Each car is provided with comfortably upholstered seats. W. B. Osborne, master mechanic, had charge of the building details.

"Babies Mixed in Cleveland"

says news item

They may do that out there, but with the A.E.R.A. Exhibit Committee on deck there'll be

No Mixing of Progeny of the Street Railway and Manufacturers

Every exhibit will be tagged and everything will be in its place in the 115,007 feet of space

Be There on Time, October 1, at 12 Noon

Unless You've Decided to Walk, Call Your Local Ticket Agent

Noiseless One-Man Cars for Minneapolis

The Minneapolis Street Railway, Minneapolis, Minn., contemplates putting one-man noiseless cars on its Bryn Mawr line to reduce the cost of operation as on this line at times only six to eight persons are carried on a trip. T. Julian McGill, vice-president, says under the circumstances there would seem to be no necessity for using two men. If the service proves satisfactory it may be extended to other lines where there is light operation. Similar service is being discussed for some of the St. Paul lines. One-man cars are utilized for local service on the Stillwater city division and some are utilized in Duluth. The 25 new cars are to be equipped with roller bearings, automobile type brakes and herringbone gears. They will cost about $25,000 each and will be turned out from the Snelling shops in St. Paul in three or four months.

R. H. Goodwillie Heads Electrical Manufacturers

R. H. Goodwillie, manager of the Otis Elevator Company, Yonkers, N. Y., was elected treasurer of the National Electrical Manufacturers Association by the executive committee at its meeting on Sept. 16, according to an announcement by Gerard Swope, president. Mr. Goodwillie succeeds J. W. Perry, formerly associated with the Johns-Manville Corporation, who has resigned from active business connections. I. A. Bennett of the National Metal Molding Company, Pittsburgh, Pa., will succeed Mr. Perry on the board of governors.

International G. E. Men Promoted

Loren Emery, merchandise sales manager of the International General Electric Company, has been appointed a member of the executive department and assigned to special duties in Mexico. He is succeeded as merchandise sales manager by R. A. Rowlands. George F. Mosher, assistant to treasurer of the General Electric Company, has been named auditor of disbursements, succeeding C. H. Stull, who becomes treasurer of the Ohio Contract Purchase Corporation, an associated company, with headquarters in Cleveland.

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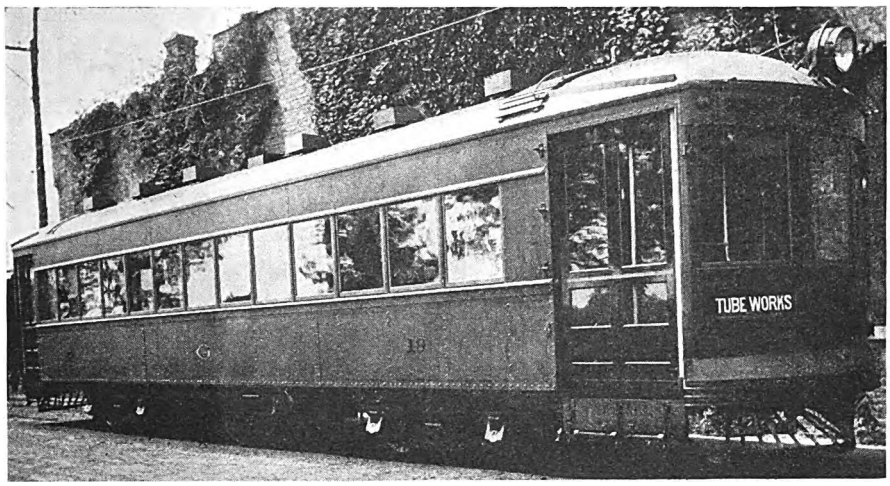
New Gary Cars Embody Utmost in Comfort and Safety

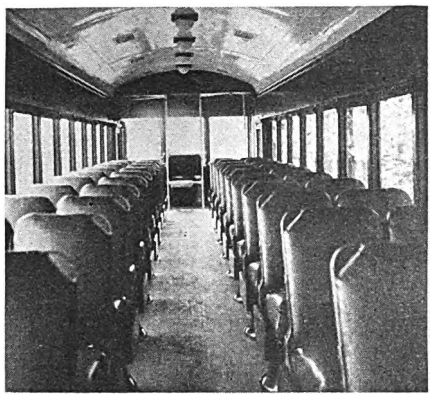
Marking another step in the progressive modernization and improvement of the system, ten new light-weight safety cars for one-man operation have recently been placed in service by the Gary Railways, Gary, Ind. The entire fleet of nine city-type cars and one interurban was built by the Cummings Car & Coach Company, Paris, Ill., and embodies the most modern principles of construction and design. Car dimensions recommended by the committee on "essential features of modern cars" were followed as far as possible, the builders using the same post centers, height, etc.

From the standpoint of comfort and attractiveness to riders the new equipment is unsurpassed by but few, if any, street cars manufactured. The low dash, a feature developed by Gary Railways engineers, gives a becoming streamline appearance to the new cars which is suggestive of speed and smoothness in riding. Equipped with four 40-hp. motors each and automatic safety and control apparatus of every description, the cars are capable of unusually rapid acceleration and retardation, features which are of great importance in operating through the congested streets.

With 52 semi-individual, leather-upholstered seats and ample aisles and vestibules the new city-type cars are designed to handle heavy loads during rush hours with comfort and dispatch. Delays in loading and unloading passengers are minimized by automatic rear door treadle exits, sliding doors and a passenger signal system which not only indicates the proper door to use on boarding or leaving the car but which also warns trailing motorists of an imminent stop. Provision against sudden incapacitation of the operator is made in the "dead man's control." With the inauguration of service with the nine safety cars on the Broadway-45th Avenue line in Gary, the company increased the headway from ten to fifteen minutes.



The low vestibule rail in line with the side belt rail carries out the streamline appearance

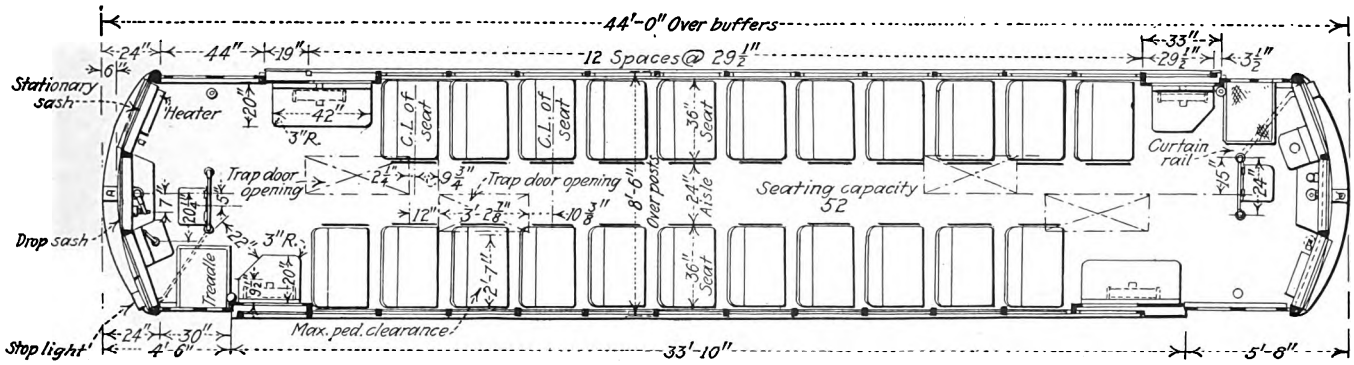


Comfort is the keynote of the interior design, the cars being equipped with semi-individual, leather-upholstered seats and having ample aisle and vestibule

Other specifications of the city-type cars are shown below.

The new interurban car differs from the city-type equipment only in the wider spacing and plush upholstery of its seats. Like the other units for local operation in Gary, this car, which is now being used on the Gary-Indiana Harbor interurban line, is finished on the interior in cherry with an ivory-toned ceiling. The cars are illuminated by standard Pullman fixtures and carpeted with handsome gray linoleum. Windows are properly spaced for clear and easy vision and are framed in brass sash.

The car is of the same type as the seven interurban cars received during January of this year and described in the Jan. 29 issue of ELECTRIC RAILWAY JOURNAL.



Plan of the new city type Gary cars. Although the length is only 44 ft., the cars have a seating capacity of 52 passengers

SPECIFICATIONS FOR GARY CITY UNITS

Type of unit	One-man, motor, passenger, city, double end, double truck
Number of seats	52
Date of order	Jan. 20, 1927
Date of delivery	June 9, 1927
Total weight	37,000 lb.
Bolster centers	21 ft. 6 in.
Length over all	44 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	11 ft. 0½ in.
Window post spacing	29½ in.
Body	All steel
Roof	Arch
Air brakes	General Electric
Axles	A.E.R.A. standard
Car signal system	Faraday high-voltage
Control	General Electric K-75
Curtain fixtures	National Lock Washer Co.
Curtain material	Black Pantasote
Destination signs	Hunter illuminated
Door mechanism	National Pneumatic Co.
Energy-saving device	Economy meters
Finish	Sherwin-Williams lacquer
Gears and pinions	General Electric
Glass	D.S.A.A. plate
Hand brakes	Pittsburgh No. 35
Heaters	Railway Utility Co. (thermostatic control)
Headlights	Golden Glow H.D.B.
Headlining	¼-in. Agasote
Journal boxes	Cummings Car & Coach Co.
Lamp fixtures	Dayton Mfg., Co., Pullman type
Motors	Four GE-265, inside hung
Painting scheme	Orange and maroon
Registers	Ohmer
Roof material	Haskelite
Safety car devices	Safety Car Devices Co.
Sash fixtures	Edwards, brass
Seats	Hale-Kilburn 392 No. A semi-individual
Seat spacing	29½-in.
Step treads	Kass
Trolley retrievers	Ohio Brass Co.
Trolley base	U.S.-20
Trolley wheels	Holland 6 in.
Trucks	Cummings Car & Coach Co., MC. No. 62
Ventilators	Railway Utility Co., Honeycomb type
Wheels, type	26-in. Davis, steel
Wheelguards	Gary Railways standard

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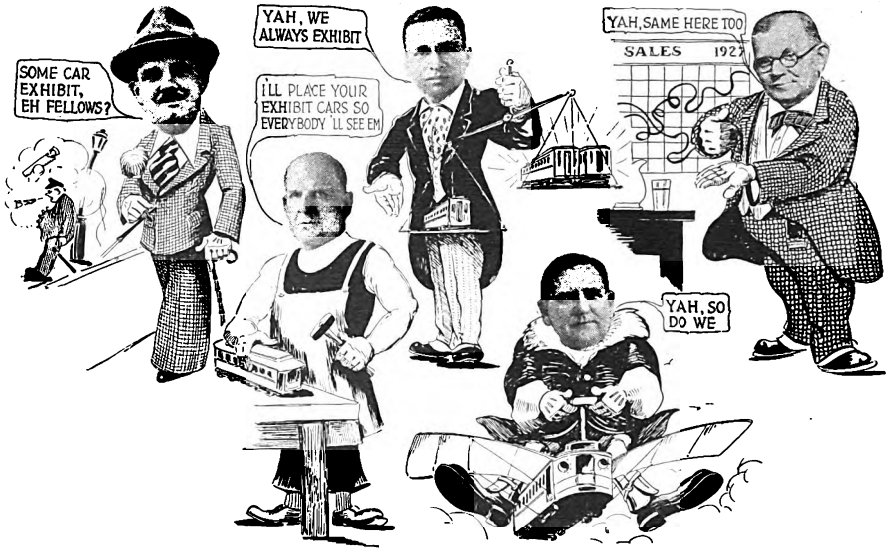
EXHIBITOGRAPHS—No. 5



We might well label this masterpiece "Great Expectations." Here are five gentlemen steeped in the art of no-pushee-no-pullee locomotion. Begin at the left, skyward, A. M. Robinson, P.M. of the Brill-American-Kuhlman-Wason aggregation, known as "Robbie," the A.M. signifying the time of day that he is going to show the buyers some real stuff. To his right is A. P. Jenks, V.-P. of the Cummings Car & Coach Company. Behind his dignified expression lurks a knockout in the matter of the light-weight material. Will the referee raise his hand at the Cleveland bout? "Were you ever in Zinzinnati?" questions the gentleman at the extreme right, A. L. Kasemeir, V.-P. Cincinnati Car Company. What is behind this question will be revealed between Oct. 1 and 7. And he with the wings, G. L. Kippenberger, "the Spirit of St. Louis," has he another world surprise in transportation like unto Lindbergh, which he will bring from the shops of the St. Louis Car Company? Another V.-P. with a royal flush?

But who is the husky Vulcan with the hammer, standing a little to the left of center? Little Charlie Clark, who when not engaged in maintaining a way for the Cleveland Railway, is chairman of the sub-committee on car exhibits. He knows all that the four others know, but won't tell, because at present he's as busy as two bees in a tar bucket.

Copper Market Active

A much larger business in copper, with all sellers participating at 13¼ cents delivered in the East, has been the feature in the non-ferrous metal markets in the week ending Sept. 20. Lead has also sold in improved volume, and the St. Louis price has advanced to 6.075 cents. Zinc and tin, however, have been quiet and slightly lower.

The large producers, who have been holding their copper at 13¼ cents delivered Connecticut, for over a month, finally brought buyers to their way of thinking, and the sales have been the largest for any week since June 1. In the East, 13¼ cents was generally realized, with a fair amount of business in the Middle West at 13⅛ cents. Foreign sales are now about normal for this time in the month, the export association's price continuing at 13½ cents, c.i.f.

The week has witnessed better business in lead, leading to an improved tone in the St. Louis market toward the end of the week. This had the effect of bringing the St. Louis price up to 6.075 cents. The New York sales have also improved, but the market price has not risen to correspond with the St. Louis quotation. In many quarters not only is no rise in price expected, but uncertainty is expressed as to whether 6.25 cents New York is rock bottom.

Galvanizers have shown but little interest in zinc this week. Until Sept. 19 6¼ cents, St. Louis, was generally realized, with an occasional carload at slightly higher prices.

Tin has been declining steadily, and even at the present low prices sales are not being made in any quantity.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Sept. 20, 1927
Copper, electrolytic, cents per lb.	12.95
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.075
Zinc, cents per lb.	6.225
Tin, Straits, cents per lb.	61.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	$4.275
Somerset mine run, Boston, net tons.	1.80
Pittsburgh mine run, Pittsburgh, net tons.	1.95
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings. Kansas City, net tons.	2.70
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$61.0

ROLLING STOCK

SEABOARD AIR LINE RAILWAY, Portsmouth, Va., has placed an order with the J. G. Brill Company, Philadelphia, for ten combination gas-electric passenger cars and nine trailers. The equipment will be used by the railroad in local interurban service. In addition to this four gas-electric cars will be built by the Electromotive Company, East Cleveland, Ohio, according to an announcement recently made by the Timken Roller Bearing Company, Canton, Ohio, which will equip the cars with its bearings.

CLEVELAND RAILWAY, Cleveland, Ohio, has ordered twenty White six-cylinder buses, which brings the company's quota to 100 vehicles, including trucks.

GREAT NORTHERN RAILWAY, St. Paul, Minn., has placed an order with the Westinghouse Electric & Manufacturing Company for six additional locomotives to be used on the Cascade Mountain electrification project. This is part of the $15,000,000 program of improvement which includes line revisions and an 8-mile tunnel through the Cascade Mountain.

TRADE NOTES

ATLAS CONVEYOR COMPANY, Philadelphia, announces the opening of offices at 20 South Fifteenth Street, Philadelphia, and the appointment of Percival K. Reed, L. G. Weygandt and E. A. Thumlert as chief engineer, Eastern sales manager and general manager, respectively.

UNITED STATES RUBBER COMPANY, New York, has announced to the trade an important addition to its line, the Usco Junior.

DELTA-STAR ELECTRIC COMPANY, Chicago, Ill., announces the purchase of the Electric Connector Company, Minneapolis, Minn., manufacturer of compression connectors. The connectors will be made now in the Chicago factory.

MALCOLM S. SIMPSON, Suite 1401 Starks Building, Louisville, Ky., has been appointed as direct sales representative for the Morton Manufacturing Company (railroad division) in the territory surrounding Louisville and including those electric railway systems located in that territory.

GENERAL WHEELBARROW COMPANY, Cleveland, Ohio, announces that the name of the Akron Barrow Company, Cleveland, has been changed to that of General Wheelbarrow Company. The announcement states that the old name is geographically wrong for a Cleveland company; also, that need was felt for a name which would be broader, more inclusive and indicative of the scope of its business. The renamed company will remain under the same management.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, October 1, 1927 *Number* 14

New York Gets Another Transit Report

NEW YORK has another transit report. This time it is Mr. Untermyer, special attorney for the Transit Commission, who presents to that body an elaborate plan which purports to outline a method for unscrambling the transportation mess in the country's metropolis. Of course that is no simple job. It is comparatively easy to stand back and criticise almost any scheme which is suggested for straightening out the tangle of politics, prejudice, physical difficulties, finances, personalities, self-interest and public ignorance involved in the New York transportation problem.

There is no intention here to analyze Mr. Untermyer's report in detail. The electric railway industry generally is little interested in the complicated legal, physical and financial scheme which is proposed. Suffice it to say that the report does not seem to put foremost the most important need, i.e., for more transit and better riding conditions for the millions of people who daily depend on its inadequate and distorted jumble of transportation lines. The word "jumble" is used in preference to "system," for by no stretch of the imagination could the latter term be made descriptive of the conditions which exist.

What the report seems to try to do is to find a way of utilizing the new subway lines to the construction of which the city is committed, and at the same time avoid the necessity of charging a rate of fare that will make these lines self-supporting, in accordance with the provisions of the law authorizing the city to undertake the construction of an independent subway. As a political expedient, this seems to be an astute move. First, the city was committed by its officials to the construction of this subway. They succeeded in inducing the Legislature to authorize it only by writing into the law the provision that the system must charge a rate of fare sufficient to make it self-supporting. If that program were permitted to go into effect, there would be presented to the intelligence of the voters the anomalous situation of privately operated subways required to charge 5 cents, while a city subway charged 8 or 10 cents for a ride. Obviously Tammany can ill afford to permit such a situation to develop. Now that the city system is well under construction, therefore, and before the people shall fully realize the blundering of its officials, Mr. Untermyer starts out to rescramble the situation, so that by dissecting the present transportation systems and taking from them the cream of their routes, the city may obtain a group of lines which will show some possibility of being operated on a 5-cent fare. What is to happen to the remnants of the private companies thus dismembered seems to be of small concern to Mr. Untermyer. In fact, one is led to believe from the report that if he had his way fully their fate would be terrible.

The retention of a 5-cent fare remains the alpha and the omega of New York's transit policy, according to this report. Everything else seems to be secondary; financial stability, efficient operation, increased convenience. Comfort and even decency for passengers do not seem to get so much as a serious thought. An elaborate and complicated plan, with many financial and legal contingencies, is set up, and the report then proceeds with meticulous care to argue that the scheme proposed would make possible the retention of a 5-cent fare. That seems to be the extent of its accomplishment. The slightest consideration does not seem to be given to showing just when the people of that city may expect to be treated less like sardines and more like human beings when they endeavor to ride on its rapid transit system.

Savings Banks Want Public Control to Continue

LEGISLATION has been drawn for introduction in Massachusetts to extend the period of public control of the Eastern Massachusetts Street Railway. This is an act that appears to be well considered. It is favored more particularly by the representatives of the savings banks of that state, who point out that under public control an insolvent railway in the hands of a receiver for a long time and in bad operating condition has been rehabilitated. The savings banks have, of course, in mind the conservation of the more than $5,000,000 of bonds of the system held as part of the assets of their 2,800,000 depositors.

The present special act went into effect in 1919. It pledged the credit of the Commonwealth for the payment of principal of not exceeding $4,000,000 of the road's serial bonds. The proposed new act in no way asks financial aid or credit from the Commonwealth. This is, perhaps, the most important distinction between the existing act and the one which the Savings Banks Association has indorsed. Under the terms of the proposed new act the Eastern Massachusetts property would continue to be operated by a board of five trustees appointed by the governor. They would have the same power as at present to regulate fares and to determine the character and extent of service. One section provides that they shall fix such fares as in their judgment will produce income sufficient to meet all operating and fixed charges, preferred dividends and 6 per cent on the common stock. Another section gives the company the right to sell electricity for light or power to the extent that it shall not be required for the proper operation of the railway, but the department of public utilities must first determine that public necessity and convenience require such sale.

The fact that the savings banks have a self-interest in seeing the present arrangement renewed detracts not a whit from the excellent record made by the railway management. Among the most noteworthy of the commendable things done was the division of the property into operating units, each made to stand on its own basis on the general theory of paying in fares to the extent

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that the service was used. This plan has worked well. So was the provision well made that the cities served might contract within limits definitely fixed to making up any deficit from operation. Fortunately rehabilitation has progressed without the need for assessing any of the cost on the municipalities, but the provision is a wise one. Despite the trials and tribulations with which it has been beset the company has maintained a constant level of net earnings in the face of steadily diminishing gross income during six years. In this achievement the one-man car played a large part. It has, indeed, been hard sledding, but the courage of the management never faltered. After its house had been placed in order the railway went in for an intensive merchandising plan. The officers resorted to every expedient, not indiscriminately but wisely and well. It is none too soon to bring the matter of the renewal of the present arrangement to public attention. The good work should be permitted to go on.

Success in Rapid Transit Involves Co-ordination

PERHAPS no better demonstration of the necessity for co-ordination of transportation facilities to obtain best results has ever been made than that given in the Beeler report on rapid transit for Cincinnati, abstracted in two articles appearing in last week's issue and in this one. Several years ago the city of Cincinnati appropriated a considerable sum for the construction of a rapid transit subway line. The line was built in the rough, but has not yet been carried to completion. Meanwhile conditions have changed so that the need for the line for its original purpose, of furnishing an entrance for a number of interurban lines to a downtown terminal, does not exist. The problem was to find a use for the investment already made, totaling some $6,100,000, so that it would bring some return to the city instead of lying idle.

Many estimates were made by the engineers to determine the best course of procedure. Naturally the simplest and the cheapest plan would be to complete the subway and run it as a separate unit. Used in this way, it was estimated that it would carry only 6,060,000 revenue passengers the first year. But by co-ordinating all the local facilities, and using surface cars, interurbans and bus lines to feed into the rapid transit line, it will carry 37,400,000 passengers the first year. Moreover, it will be possible to reduce the surface transportation mileage where it would duplicate the rapid transit, and so make a saving so great that not only will the combined system pay operating expenses, but from the start there will be almost enough revenue to meet fixed charges on the $10,600,000 additional investment needed to complete the system.

A word of caution is not amiss for those who, for various selfish reasons, desire to modify any plan proposed so as to gain preference for some particular locality. It is shown conclusively that the addition of only three stations to those recommended would destroy the usefulness of the rapid transit line in the outer sections, would involve a serious loss of patronage, and would result in a deficit instead of a profit.

Every city administration that is faced with a need for rapid transit will do well to ponder this report, for it contains the essentials of success or failure for such an enterprise, set forth in no uncertain terms.

Prospects for Federal Income Tax Reduction

CORPORATIONS, as a whole, have been very patient with the federal government for leaving them out when favors in the form of tax reductions were to be handed out. Indeed, they accepted increases with comparative complacence when others were enjoying reductions. And probably little would be done about it now, even though the corporation rate was increased from 13 to 13½ per cent and is now more than 2½ times the maximum normal rate for individuals and partnerships, had not the Treasury piled up an unprecedented surplus of $636,000,000.

Is there anything inherent in the corporation form of business ownership and operation that would justify such high taxation as compared to that of individuals and partnerships? Its main characteristic is that of limitation of liability, but the present rate of taxation imposes a very high rate of premium for this kind of negative insurance. If this unusually high rate of tax is to be continued we may expect to find more and more corporate businesses changing to another and cheaper form, or, where this cannot be done, we may expect profits to decrease and the salaries of those in control to increase. An investigation of the income tax returns of one of our Middle Western states disclosed an alarmingly large number of corporations which were prosperous but were paying no dividends. The paradox of a lower rate of tax bringing in greater returns may be seen if the federal government reduces its rates.

A great part of the Treasury surplus above mentioned has already been paid out in debt retirement, but a huge sum is still available for return to the taxpayers. Whose turn is it to benefit? Under the act of 1926 the number of persons paying income tax to the government was reduced by almost one-half. While 7,369,788 persons made returns in 1925, only 4,171,051 did so in 1926. There are many who feel that the individual exemptions are already low enough and that too many people escape federal taxation. At any rate, there is little argument for further favors to this group while the corporation tax remains so high. For the holders of the shares of corporations represent an enormous group of people—rich, middle class and poor—and either they must pay a high rate of tax for the privilege of investing in this form of business enterprise or pass the tax along—if they can! It is not often they can pass it along and they usually have to pay it.

There are some who feel that the demands for flood relief and control will make tax reduction impossible just now. Secretary Hoover, who may be expected to have clear ideas on this subject, says that reasonable demands for such purposes should not interfere with substantial reduction of the income tax, and that annual appropriations will suffice. If a tax reduction is to be made at this time, corporations should certainly benefit by it. Reductions for them are long overdue. The sentiment in the ways and means committee and among members of both houses of Congress is more favorable to the cause than ever before. This splendid opportunity should be used so that the case may be kept prominently before them. Every corporation executive in every state should bring this matter to the attention of his representative in Congress and the Senate in the interests of his stockholders and in those of the buyers of his goods or services.

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The Special Library a Valuable Adjunct

WITHIN the last few years a new form of activity has been added to the work of the utility corporation. It is that of maintaining a special library for the purpose of keeping on file within ready reach all information available about the subjects in which the various departments are interested. In this way it differs radically from the general library, which is content with the usual catalog, but largely leaves to the reader the work of locating and classifying articles on a particular subject.

Several electric railways have for a number of years devoted considerable effort to the development of libraries of this type. The work they have done has been noteworthy. For this reason the article on the conduct of the library of the Philadelphia Rapid Transit Company, published in this issue, is of particular value. While this library is organized along the same lines as others which were established earlier, in a relatively short time an invaluable set of references have been built up. Then, too, through a co-operative association the information that has been collected by the several libraries of this class is made available to all, and a vast fund of information has been assembled on practically any subject in the field of the industry.

Wood Preservation Progressing

LATEST statistics show that there are in the United States approximately 400,000 miles of steam railroads and about 47,000 miles of electric railways. The total number of ties in steam railroad tracks is approximately 1,100,000,000, of which about 730,000,000 or 66 per cent are treated. At the present time the steam roads are installing about 100,000,000 ties annually, of which approximately 65,000,000 are treated.

There are in electric railway tracks about 124,000,000 ties. According to the records of the United States Department of Commerce and the Department of Agriculture, the electric railways purchased approximately 5,000,000 untreated and 1,120,000 treated ties in 1925. No records are available to show the number of untreated ties which were subsequently given some form of treatment by the purchaser, but it is quite probable that it would not materially affect the comparison.

From the above, it is evident that while the steam railroads are replacing slightly less than 10 per cent of the total number of their ties per year, 65 per cent of new ties have been treated. On the other hand, the electric railways are apparently replacing slightly less than 5 per cent of their total ties per year and treat less than 20 per cent of their new ties. The difference in the proportion of renewals is, of course, partly because the electric railways do not have the same proportion of renewals on account of mechanical wear as do the steam roads, and partly because of the more extensive use by the former of substitutes. No data as to the extent of the use of the latter are available, but they would undoubtedly show up favorably to the electric railways. The situation, however, is one which from the electric railway standpoint leaves considerable room for improvement.

At least two electric railway properties, Boston and Atlanta, own and operate their own treating plants and treat all ties and most of their other timber. One of these companies reports a cost of only 8.7 cents per treated tie per year as compared with 13.3 cents per untreated tie per annum. Pressure treated creosoted ties have been known to give 30 years life in paved electric railway tracks. An extensive test installation on one steam railroad showed over 80 per cent of creosoted tie installations still sound after 17 years of service, and of the remaining 20 per cent more than half were removed for reasons other than decay. In this test it was proved that the average life of untreated ties ranged from 3.1 years for cottonwood to 8.5 years for white oak. The creosote treatment was full cell 10-12 lb. per cubic foot. In European tracks, life of treated ties as high as 40 years has been reported.

Big Returns from a Small Investment

PRESERVATIVE treatment is not limited to ties. The advantage for other timber is well known. Data recently published on a yellow pine pole line on the Bell telephone system between Hurricane, Ala., and New Orleans, La., which was installed in 1899, showed that in 1925 only 13.5 per cent out of a total of 7,644 treated poles in the line had been replaced because of decay. According to these data, the Bell system is now using between 600,000 and 700,000 poles annually, of which 90 per cent are treated. Government statistics show that the total number of poles being used per year is about 3,250,000. It is estimated that the telephone, telegraph, railroad and power companies are now treating about 2,500,000 poles annually, or 80 per cent of the total requirements. This is 6½ times the number treated in 1909.

About 10,000,000 cross arms are now being used per year, of which about 1,000,000 are treated. While this is only 10 per cent of the total, it represents an increase of 1,500 per cent over the number treated in 1909.

While reasonably accurate data are not available for posts, car timbers and mines, it is reasonable to assume that there is at least an equal opportunity for improvement in these fields. The records show that there are now being treated approximately 400,000,000 ft. b.m. of construction timber and miscellaneous material per year, but this represents only about 1 per cent of the total annual production of such timber, and while it represents a gain of 38 per cent over the amount treated in 1909, there is still much left to be desired.

The economies to be effected from preservative treatment of timber are so obvious as hardly to require argument. It is not a matter of first cost, but rather one of average annual cost during the useful life of the material. The experimental stage has been passed, the anticipated life of treated timber upon which installations were originally justified has been exceeded, and the element of uncertainty has been removed. There would appear to be no good reason for hesitation in the matter of choosing between treated and untreated timber. Every dollar spent on treated timber is the same as putting money away in the bank, where it will earn a substantial return to the investor.

The wood preservation committee of the American Electric Railway Engineering Association has been doing excellent work for several years along the lines of educating the electric railway industry as to the benefits to be derived from wood preservation, but "reading the directions on the bottle will never cure the ill." The directions must be followed and the dose taken as prescribed.

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Part of the P.R.T. library staff, which furnishes technical information for the 12,000 employees

12,000 Employees Can Use This Library

P.R.T. librarians are called upon by all departments for information on transportation, economics and related subjects—The 6,000 books and 150 periodicals kept on hand are of vital importance in employee training—Library exhibit to be seen at A.E.R.A. Cleveland convention

IT MAY readily be understood that the important function of a special business library is to correlate and provide information on subjects of pertinent interest to the organization which it serves. Such a library must be more than an imposing row of well-filled bookcases, more than an amply filled periodical rack, more, even, than an efficient filing and clipping bureau. The company library must serve as an effective digestive apparatus, consuming vast quantities of printed words and skimming from that material the trace of nutritive information for which the company's executives and the rank and file of its employees may be seeking.

What the public library, serving persons of every type and interest, cannot do, the special library is created for the explicit purpose of doing. Its chief librarian and assistants are specialists in securing from material already on hand, or from outside sources, the information requested, almost always in a rush, by the personnel of the company and, so far as possible, in anticipating and meeting those requests in advance.

In so far as the company's librarians are able to shoulder a portion of the load of the executives and to carry on at least the preliminary steps of a research along lines desired by the various departments, the special library proves itself as one of the most important functions of the company. Hardly less important is the cooperative part which it may play with the employee training activities, now being carried on by so many of the larger and even the smaller companies in every type of industry.

The Philadelphia Rapid Transit Company perhaps has more diversified fields of activity than any other urban transportation system at the present time. Not only does it embrace every type of public transportation in Philadelphia, high-speed lines, street cars, city and intercity bus service and taxicabs, but its employees and management also embarked some time ago upon the high seas of finance, with the establishment of the Mitten Bank under Mitten auspices.

In a rapidly expanding organization such as this there are, of course, constant calls for specific information on innumerable subjects. The executives and the employees wish to be kept constantly in touch with new developments in the street railway, motor bus and taxicab industries,

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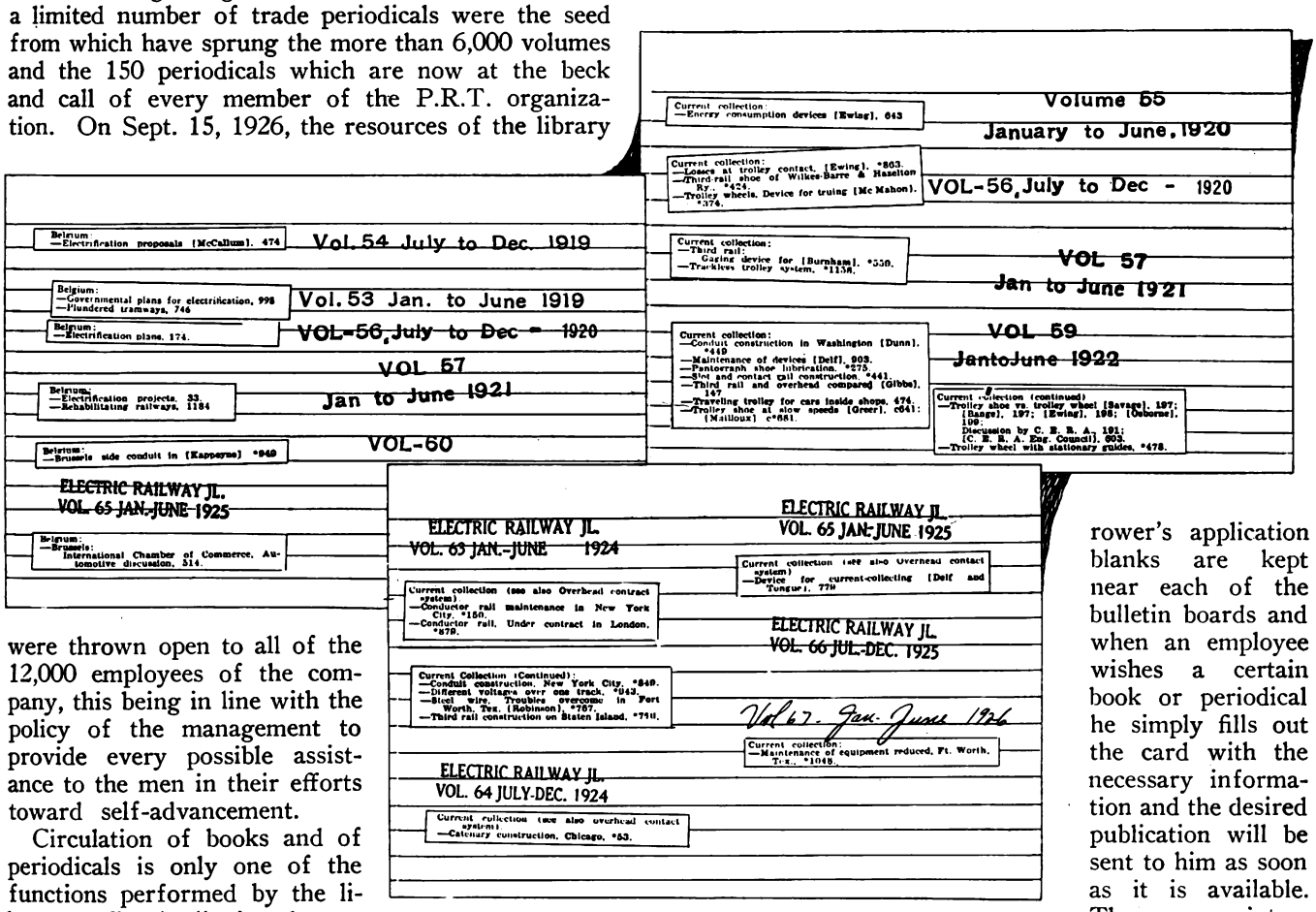
and such related subjects as co-ordinated transportation, accounting practice, customer and public ownership, employee and public relations, benefited property assessments, cost of living, accident prevention, traffic problems, indeterminate permits, employee representation in management, foreman training, fares, wages, investment practice and countleses other matters.

One of the features of the P.R.T. library is to bring these subjects to the attention of the persons directly interested in the various problems—in abstracted form when possible and always so as to reduce the amount of unproductive "digging" which must be done by the individual seeking information.

The library was first established as a central bureau in 1919. Its beginnings were small. One bookcase and a limited number of trade periodicals were the seed from which have sprung the more than 6,000 volumes and the 150 periodicals which are now at the beck and call of every member of the P.R.T. organization. On Sept. 15, 1926, the resources of the library were thrown open to all of the 12,000 employees of the company, this being in line with the policy of the management to provide every possible assistance to the men in their efforts toward self-advancement.



Information on certain subjects is prepared and sent to a list of officials on Lefax cards

Circulation of books and of periodicals is only one of the functions performed by the library staff. A clipping department is maintained which combs the newspapers of Philadelphia and of cities in many other sections of the country, searching out relevant news notes which are pasted into daily clipping books and circulated among the company's officials. To increase the effectiveness of this work a number of outside clipping services are also utilized.

Since the central filing department is a natural corollary of the library, it too comes under the jurisdiction of the librarian. This work includes the classification and filing of all company mail, interoffice communications, reports and other material which must always be at hand for ready reference.

Book Reviews and Library Bulletins

So that the employees may constantly know what new material the library has available for them, considerable use is made of the 100 company bulletin boards, which are located in the carhouses, garages, shops, general offices and other departmental locations. Some form of library publicity is posted at all times, including lists of new books received during the month, with very brief reviews of each; lists of short abstracts of magazine articles, etc. All of these library bulletins are, of course, sent to the various officials.

All of the 150 periodicals subscribed for are carefully reviewed and articles of particular interest are abstracted. These short abstracts are typed on a routing sheet and pasted on the outside of the magazine in which they appear. The magazine is then routed to a regular list of readers and to such individuals as may be interested in special features which appear therein. Pads of borrower's application blanks are kept near each of the bulletin boards and when an employee wishes a certain book or periodical he simply fills out the card with the necessary information and the desired publication will be sent to him as soon as it is available. The company interoffice mail is utilized for this service. No charge is made to the employees for any of the library service, but they, of course, are held responsible for books and periodicals loaned and are expected to return them within a reasonable period.

To determine how extensively the employees are making use of the library and also to ascertain the type of material which is most in demand careful records have been kept of all publications loaned and the locations to which they are sent. It was found, as might be expected, that shop employees were particularly interested in mechanical works and in maintenance articles published in Electric Railway Journal and elsewhere, while trainmen centered their attention on subjects lying more nearly in their field of activity, such as traffic studies, co-ordinated transportation, etc. All employees, however, have in common a very real interest in personal

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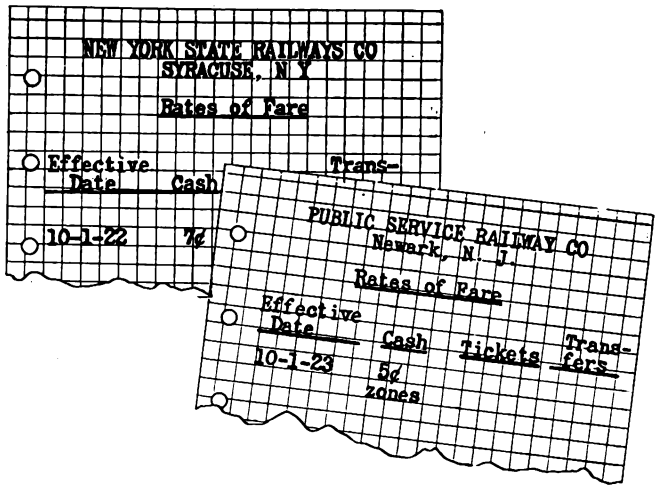


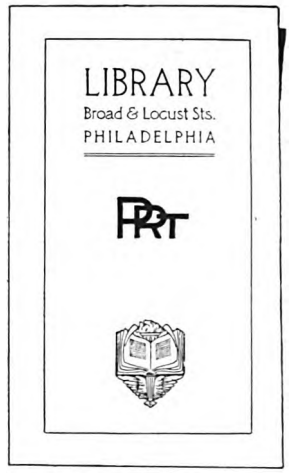
Some of the index cards which make easy the finding of information on special subjects of interest to the library's users

analysis, investment practice, public and employee relations and similar more general subjects. "How to Get Ahead Financially," by William A. Schnedler, and "Financial Independence, How to Win It," by Harvey A. Blodgett, are two of the most popular volumes on the library shelves.

Working with the Training and Educational Division

The company is constantly expanding its educational work among the employees and the facilities of the library are thus being subjected to a corresponding increase in demand. Three correspondence courses, "The Electric Railway Industry," "Handling Men" and "Public Relations," are now being offered to the men and evening classes in public speaking, mathematics, English, blueprint reading and similar subjects will be offered during the fall and winter months. With all of these the library must co-operate by preparing reading lists and suggesting texts which will provide valuable supplementary information for those participating in the courses.

Extra copies of books and magazines which are subjected to the greatest demand are purchased, so that long delays in getting a desired publication may be avoided. An attempt is made to obtain copies of all surveys made in Philadelphia and in other cities on problems which affect coordinated transportation. When a particularly illuminating survey is made extra copies are secured and distributed to employees who request them.



The bookplate by which the volumes owned by the P.R.T. library are identified

The annual reports of the company are exchanged with about 100 other transportation companies and this collection of reports is of great assistance in the compilation of comparative statistics. The company publications, *Service Talks* and *P.R.T. Co-operator*, are also exchanged with a large number of other companies and publications received in return are routed to interested officials and are then filed.

A fare and wage history of street railway and motor bus companies of comparable size has been compiled. A book of fares and wages in effect is made up on $3\frac{3}{4}$x$6\frac{7}{8}$-in. Lefax sheets. Copies of this book are in the hands of the various department heads. As fare and wage changes occur revised sheets are distributed.

Bound volumes of Electric Railway Journal and its predecessors from 1894 to date are maintained by the library. A cumulative index for this publication, from 1916 to date, is prepared to facilitate ready reference. This indexing has been accomplished by clipping and pasting all index references to articles on one subject on one or more cards. The volume number appears above the clipping, as is shown in an accompanying illustration.

Service Talks and *P.R.T. Co-operator* are bound with a carefully prepared index. A frequent query with the library is "Where did we publish this?" and it is thus essential that all company publications be thoroughly indexed.

The A.E.R.A. compilations, which are found to be of great assistance and value, are filed in vertical steel cabinets using the same subject headings which the association publishes in its annual report.

A large collection of legal books is maintained for the benefit of the company's legal staff. This collection includes the various Reporters, Pennsylvania Superior and Supreme Court Reports, U. S. Superior Court Reports, the American Law Reports, U. S. Supreme Court Reports and Pennsylvania Court Reports. An index to all legal opinions emanating from the company's legal staff is prepared.

Other sources of information which are filed over a period of years are: Decisions and reports of the New York Public Service Commission, the New York Transit Commission, Pennsylvania Public Service Commission decisions, Philadelphia ordinances, Mayor's messages, city transit department reports (Board of Supervising Engineers of Chicago Traction report), the *Commercial*

ROUTING SHEET

ARTICLES OF SPECIAL INTEREST IN
ELECTRIC RAILWAY JOURNAL

Date May 14, 1927

SUBJECT	Page
BOSTON ELEVATED RAILWAY Legislation for Boston "L" fails - valuation ordered.	879
BROOKLYN CITY RAILROAD Dividend policy explained. Circumstances connected with passing of Brooklyn City dividend reviewed - $11 000 000 for improvements.	882
BROOKLYN - MANHATTAN TRANSIT CORPORATION Approval of $20 000 000 Brooklyn refunding issue sought.	882
BUFFALO MOTOR BUSES Duplication not the answer in Buffalo. Application has been denied the Buffalo Motor Coach Co. to operate	
Mitten Bank has merged with Brotherhood of Locomotive Engineers Title and Trust Co. merged in Philadelphia.	878
MONORAIL Monorail proposal for Detroit under advisement.	879

Your attention is called to special articles contained herein. When you finish reading, kindly initial and date, and forward to next succeeding name. If you do not contemplate prompt use of magazine please forward, and after routing has been completed it can be secured from library or photostatic copies of desired articles obtained.

Librarian, 1520 Spruce Street.

Messrs: W. K. Myers ✓
C. E. Ebert ✓
W. M. Campbell
H. B. Hutchinson ✓ JUN 3 1927
W. W. Logan ✓

Items of special interest in the leading periodicals are listed by the librarian on the routing sheet which is sent with the magazine

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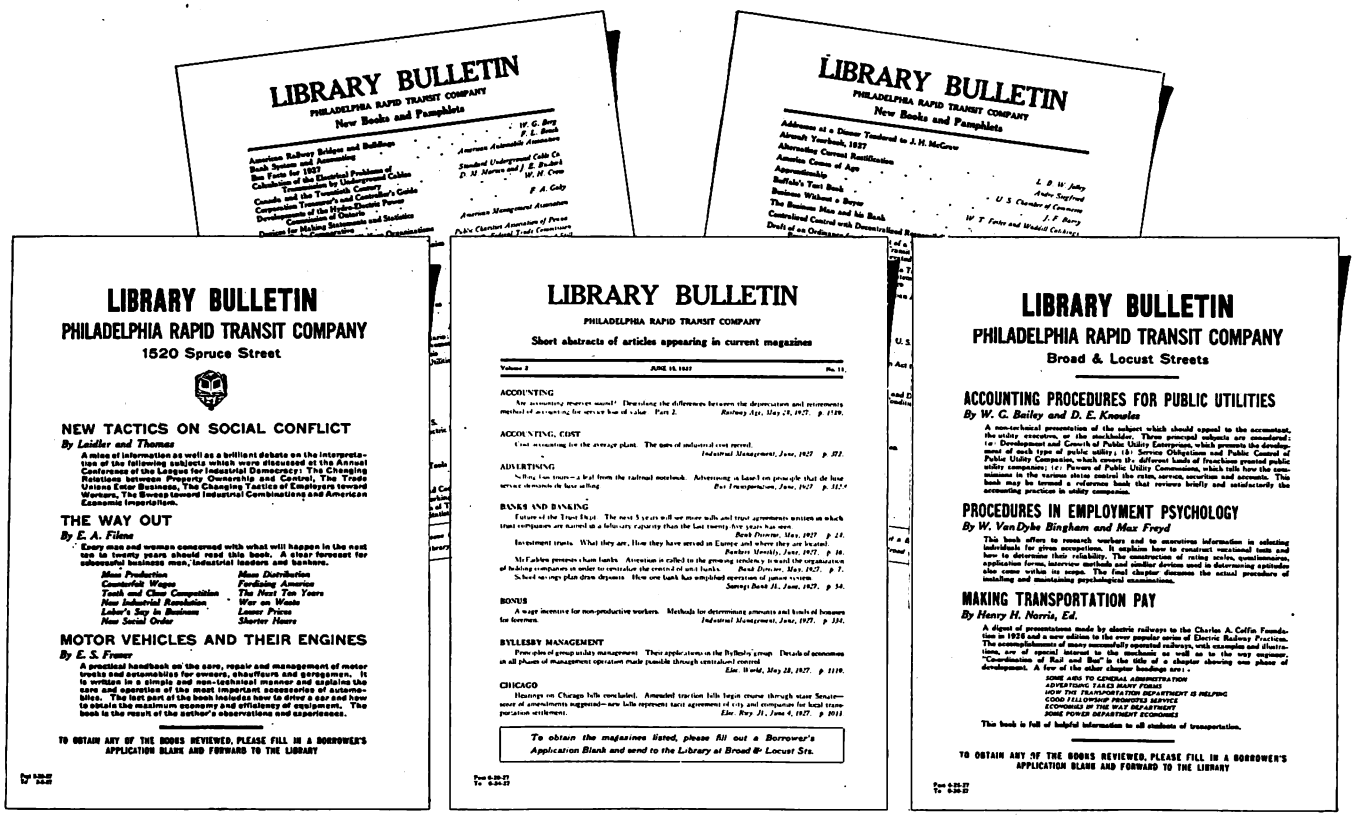


Weekly bulletins issued by the library call attention to the most important books and magazine articles. They are posted on the company bulletin boards

& Financial Chronicle (from 1920 to date), *Aera* (from 1912 to date), A.E.R.A. *Proceedings* (from 1905 to date), *Moody's* and *Poor's Manuals* (from 1911 to date), *Public Utilities Reports,* and reports of the Boston Transit Commission.

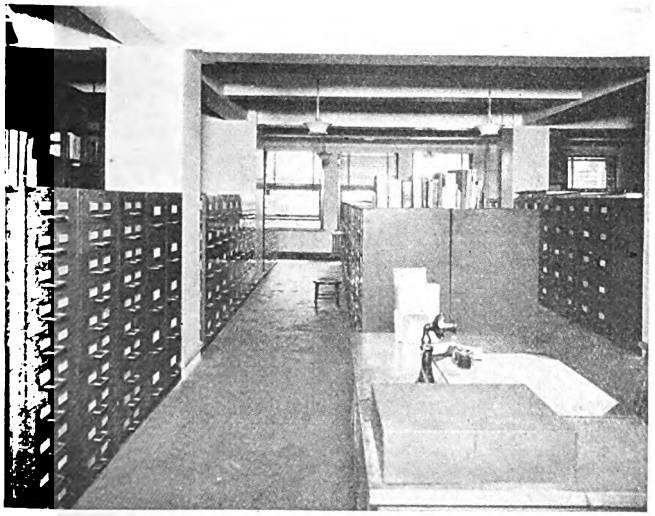
Such services as the *Industrial Arts Index, Reader's Guide, Public Affairs Information Services* and *Commerce Clearing House* are found to be of considerable value. The publications of the American Management Association are used quite extensively and are bound in Strapflex binders by series.

The library uses a slightly modified Dewey decimal classification system and Library of Congress subject headings are followed with variations. Library of Congress cards are used whenever possible.

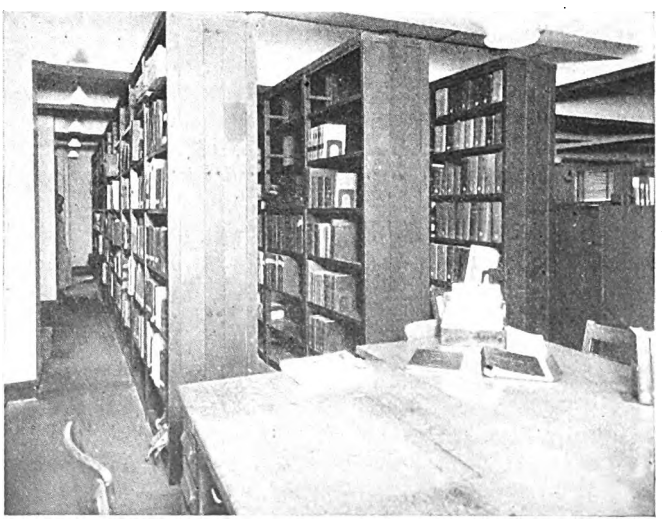
The P.R.T. library is a member of the Special Libraries Association and of the Special Libraries Council. It has established contacts with information sources both locally and nationally and these are of tremendous value when material is desired which is not available in the library's own files.

To Participate in Exhibit at Cleveland Convention

A library exhibit at the Cleveland convention of the A.E.R.A. has been arranged for by the Special Libraries Association. The exhibit will be in charge of Miss Alma C. Mitchill, librarian of the Public Service Corporation of New Jersey, who is chairman of the committee; Mrs. C. S. Faltermayer, librarian of the



The central files of the company are under the librarian's direction



There are more than 6,000 volumes in this library of the Philadelphia Rapid Transit Company

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Here are the "Best Sellers" as indicated by the reading of P.R.T. employees during a recent four-month period.

MOTOR VEHICLES AND THEIR ENGINES, *by Edward Smith Fraser and Ralph B. Jones*

HOW TO GET AHEAD FINANCIALLY, *by William A. Schnedler*

FINANCIAL INDEPENDENCE—HOW TO WIN IT, *by Harvey A. Blodgett*

INCREASING PERSONAL EFFICIENCY, *by Donald A. Laird*

MAKING OF PERSONALITY, *by Bliss Carman*

ELECTRICAL RAILWAY PRACTICES *(edited) by Henry H. Norris*

HANDBOOK OF SAFETY AND ACCIDENT PREVENTION, *by Fred W. Lange*

PRACTICAL FOREMANSHIP, *by Glenn Gardiner*

FOREMAN TRAINING, *by Cyrus McCormick*

TECHNIQUE OF EXECUTIVE CONTROL, *by Irwin H. Schell*

HOW TO MAKE AND USE GRAPHIC CHARTS, *by Allan C. Haskell*

ELECTRIC RAILWAY TRANSPORTATION, *by Henry W. Blake and Walter Jackson*

THE WAY OUT, *by Edward A. Filene*

MAKING TRANSPORTATION PAY, *(edited) by Henry H. Norris*

PRACTICAL RAILWAY MAINTENANCE, *by Charles W. Weiss*

ELECTRIC POWER STATIONS, *by L. W. W. Morrow*

Philadelphia Rapid Transit Company, and Lewis A. Armistead, librarian of the Boston Elevated Railway.

Copies of a specially prepared booklet entitled "The Value of a Company Library" have been prepared by this committee and have been sent to various transportation companies. Copies will be available at the Cleveland convention or may be obtained from any of the committee members.

The purpose of the library exhibit will be to point out the type of service which a company library should be equipped to render and to demonstrate the relative ease with which such a department may be established and built up to be one of the most useful adjuncts of the organization. The point will be made that a small company has quite as much need for a library of its own as have the larger organizations, although, of course, it will not need to be as extensive as those of the metropolitan companies.

Bus Speed on Fifth Avenue

IN THE caption of the illustration appearing on page 486 of ELECTRIC RAILWAY JOURNAL for Sept. 17, it was stated that the speed of buses in the congested section of Fifth Avenue, New York City, in the rush hour was "about 5 m.p.h." The figure should have been "3 m.p.h."

Car Building and Shop Statistics

STATISTICS of the car manufacturing industry are issued by the United States Census Department every two years. Included in them are statistics of electric cars built and electric railway repair shops.

Table I shows the electric railway cars built in 1925, according to figures in the latest census. The data are divided into freight and passenger cars. The table includes not only those manufactured in car building plants but also in railway shops. The value of the 1,798 passenger cars built is given in the report as $19,604,813, and that of the 89 freight and other cars built as $453,479.

Table II gives statistics of the electric railway repair shops in the country for the three years mentioned in the table. These figures, however, do not include data for establishments with products under $5,000 in value. The average number of wage earners during 1925 employed in the shops included in the table was 32,521; during 1923, 34,925, and during 1921, 33,279. The wages paid in these shops during 1925 were $48,357,386.

Table III gives detailed statistics of the work performed in the shops listed in Table II.

TABLE I—ELECTRIC RAILWAY CARS BY CLASSES AND TYPES OF CONSTRUCTION, BUILT IN THE UNITED STATES IN 1925

	Passenger	Freight and Other	Total
All wood	11	5	16
Steel under-frame	424	43	467
Steel body with wood interior	955	..	955
All steel	408	41	449
Total	1,798	89	1,887

TABLE II—OUTPUT OF ELECTRIC RAILWAY REPAIR SHOPS IN THE UNITED STATES, 1925, 1923 AND 1921

	1925	1923	1921
Number of establishments	521	547	560
Wage earners (average number)	32,521	34,925	33,279
Wages paid	$48,357,386	$49,225,583	$47,775,235
Paid for contract work	$121,883	$110,949	$105,862
Cost of materials*	$29,738,148	$31,981,650	$33,560,133
Value of products	$83,812,220	$86,412,645	$87,312,426
Value added by manufacture†	$54,074,072	$54,430,995	$53,752,293
Horsepower	70,479	62,370	‡

*Includes also cost of fuel, electric power and shop supplies.
†Value of products less cost of material.
‡Not called for in schedule.

TABLE III—DETAILED STATISTICS OF WORK PERFORMED IN ELECTRIC RAILWAY REPAIR SHOPS IN THE UNITED STATES, 1925, 1923 AND 1921

	1925	1923	1925
Total value of work or products	$83,812,220	$86,412,645	$87,312,426
Motive power and machinery departments, value	$6,210,757	$7,303,978	$7,715,044
Electric locomotives built—			
Number	14	17	*
Value	$216,078	$198,775	*
Repairs to motors, etc., value	$5,525,622	$6,692,410	$7,226,905
Work for other corporations, value	$117,000	$101,754	$78,472
All other work or products, value	$352,057	$311,039	$409,667
Car departments, value	$73,177,906	$75,070,768	$75,529,519
Cars built, value	$608,988	$3,523,648	$1,248,267
Passenger—			
Number	45	299	127
Value	$574,664	$3,287,447	$822,398
Freight—			
Number	2	47	2
Value	$9,633	$103,738	$7,200
Other—			
Number	6	37	48
Value	$24,691	$132,463	$418,669
Repairs to cars of all kinds, value	$65,392,764	$65,420,854	$69,131,546
Work for other corporations, value	$1,216,247	$1,486,380	$1,249,497
All other work or products, value	$5,959,907	$4,639,886	$3,900,209
Bridge and building departments (shop-work only), value	$639,619	$438,624	$516,942
Repairs and renewals, value	$608,317	$434,590	$420,445
All other work or products, value	$31,302	$4,034	$96,497
All other work or products, not classified, value	$3,783,938	$3,599,275	$3,550,921

*None reported.

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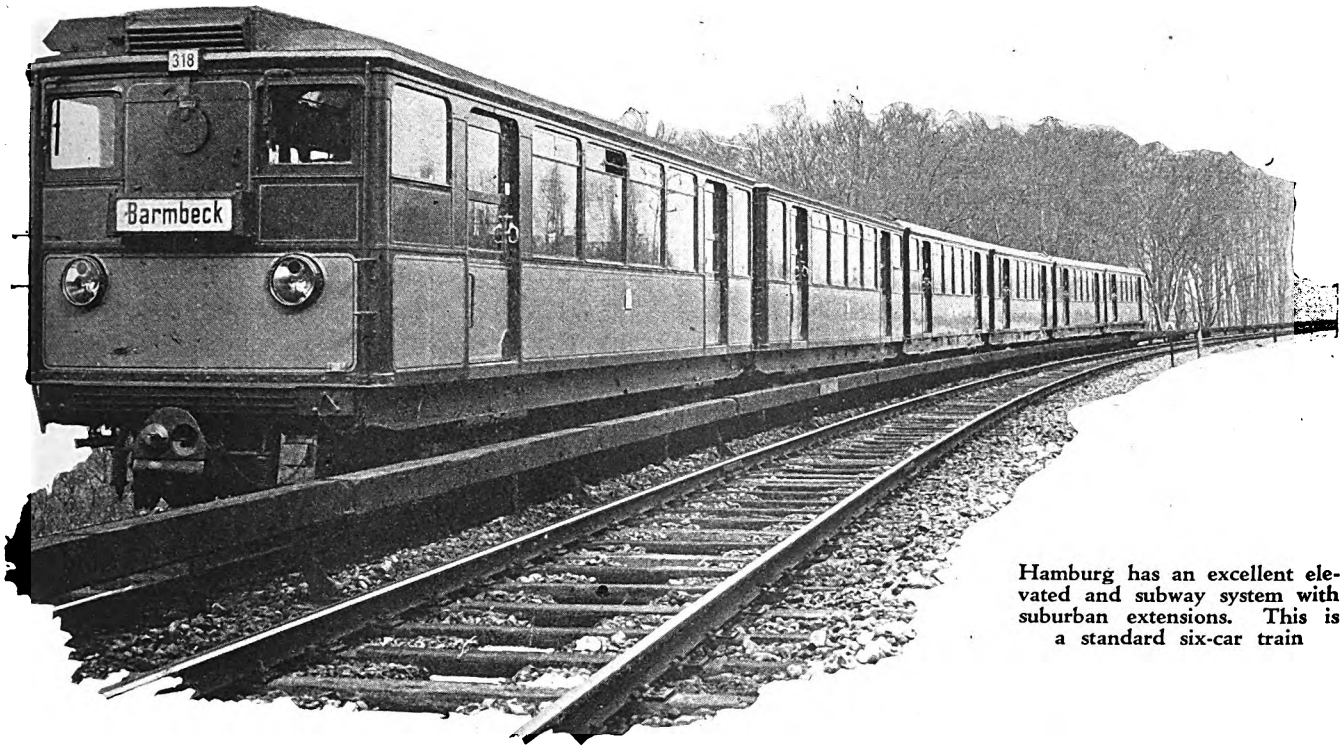

Hamburg has an excellent elevated and subway system with suburban extensions. This is a standard six-car train

Rapid Transit

Car Design and Noise Reduction *in Europe*

European rapid transit cars are developing along American lines. Considerable progress has been made in London in the direction of reducing the noise from car operation. European surface cars are noticeably more quiet in movement than those in the United States

By Henry W. Blake
Senior Editor *Electric Railway Journal*

CARS on the rapid transit lines in Paris, Berlin, Hamburg and London bear a closer resemblance to those used in America than do the street cars. The bodies generally are of steel throughout, with multiple side doors, and the arrangement of seats gives large standing capacity. Sometimes these seats are entirely longitudinal, sometimes there are two or more pairs of cross seats on each side of the aisle.

All of the lines mentioned use sliding doors that are closed while the train is in motion, but otherwise the door arrangements differ greatly. The latest cars in London, those for the Hampstead Tube, have an arrangement similar to the Interborough system of door control. The Hampstead Tube is running two trains, one of six cars and one of seven cars, with only one guard per train and electro-pneumatic door control with bell signal interlocked with the doors. The guard is near the rear end of the train and can communicate with the motorman by a telephone with a loud speaker in the latter's cab. This line will introduce automatic doors as rapidly as possible because of the saving in labor, and it is expected that they will be on all tube cars within three years.

On the rapid transit lines in Paris, Berlin and Hamburg the general practice is for the passengers to open the doors at stations, but for a member of the train crew to close them, usually by electrically controlled air engines. The Berlin elevated and underground railway, however, is putting on three sample trains, each with multiple-unit door control of different types. One will be of the Paris type, one a modified National Pneumatic type, and one the Kunz-Knorr type. In the National Pneumatic type one door engine operates both halves of each door, the power being transmitted to each half independently so that the work is equally distributed on both sides of the engine crosshead. If the door is obstructed while being closed the engine automatically adjusts its pressures so that the door will not slam when the obstruction is removed. The engine also has an automatic cushioning feature which eliminates the possibility of the door slamming at any time. Although

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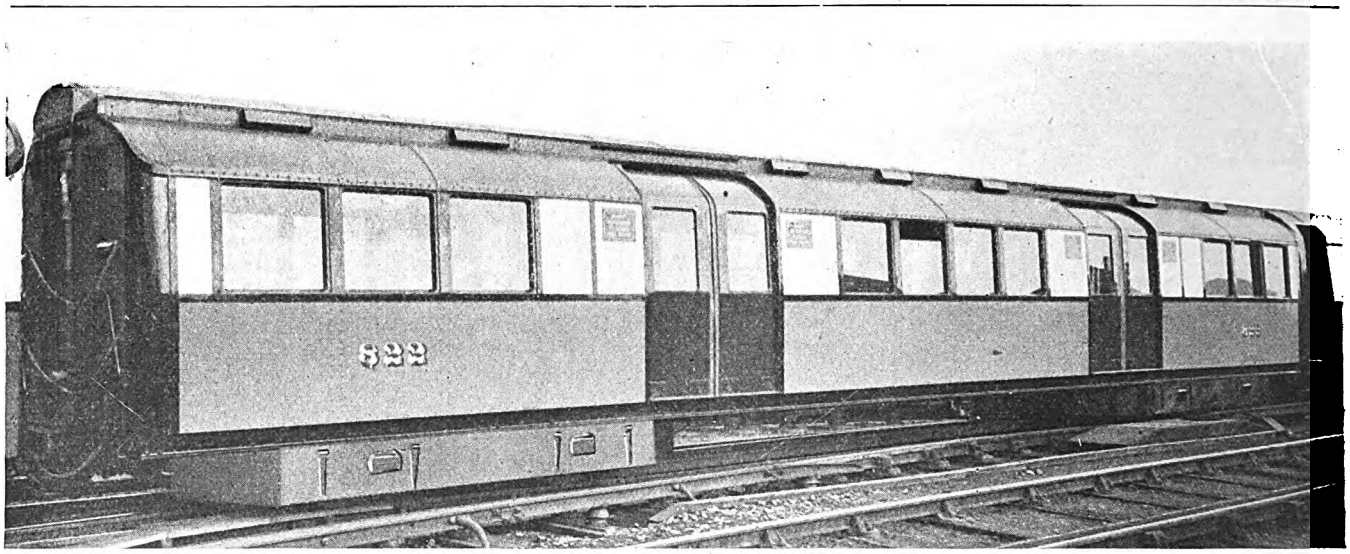
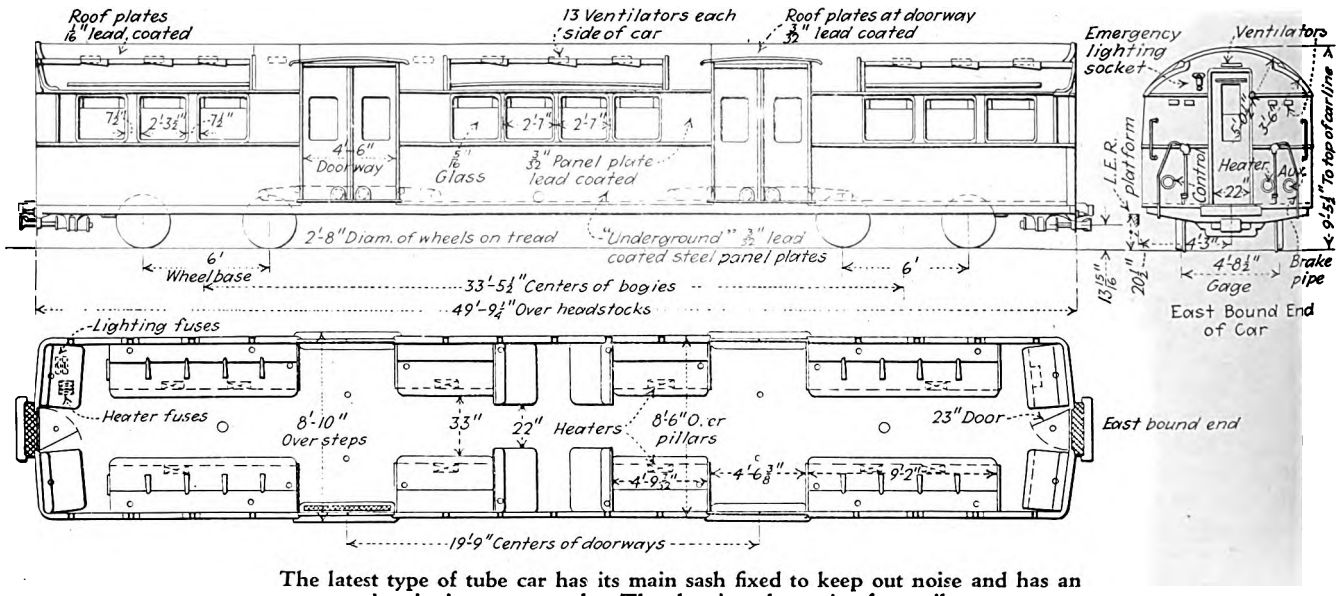


A "skirt" of ferrodo was built around the trucks of the London tube cars to confine the noise

Table Showing Weight of Cars on London Tube Railways in Tons of 2,240 Lb. Each

Type of Car	Weight of Car, Tons (2,240 Lb.) Total	Car Body	Motor End	Trailing End	Control End	Motor Truck	Motor Trailer Truck	Trailer Truck	Seating Capacity
Piccadilly standard (motor car)	27.62	14.03	19.45	8.17	.....	10.52	3.06	....	42
Piccadilly converted (motor car)	29.59	16.00	19.67	9.91	.....	10.52	3.06	....	32
Bakerloo standard (motor car)	28.91	15.32	19.16	9.74	.....	10.52	3.06	....	42
Bakerloo Brush (motor car)	29.82	16.15	19.43	10.40	.....	10.52	3.15	....	36
Bakerloo converted (motor car) (*a*)	27.60	14.01	19.25	8.35	.....	10.52	3.06	....	34
Bakerloo joint stock (motor car)	32.49	17.43	21.95	10.54	.....	11.86	3.20	....	36
Hampstead standard (motor car)	27.53	13.94	19.39	8.13	.....	10.52	3.06	....	42
Hampstead Metro (1923) (motor car)	31.52	15.80	22.23	9.29	.....	12.29	3.43	....	30
Hampstead Cammell (1923) (motor car)	31.99	16.29	22.31	9.67	.....	12.21	3.48	....	30
Hampstead Metro (1924) (motor car)	32.65	16.96	23.10	9.55	.....	12.21	3.48	....	30
Hampstead Cammell (1925) (motor car)	33.11	17.42	23.04	10.07	.....	12.21	3.48	....	30
Piccadilly standard (trail car)	16.89	10.86	.....	.....	.....	.....	....	3.01	52
Piccadilly Cammell (1919) (trail car)	18.25	12.52	.....	.....	.....	.....	....	2.86	44
Bakerloo standard (trail car)	18.14	12.11	.....	.....	.....	.....	....	3.01	52
Bakerloo joint stock (trail car)	21.20	14.80	.....	.....	.....	.....	....	3.20	48
Hampstead standard (trail car)	16.63	10.61	.....	.....	.....	.....	....	3.01	52
Hampstead Cammell (1923) (trail car)	18.45	11.69	.....	.....	.....	.....	....	3.38	48
Hampstead B'ham (1923) (trail car)	17.75	11.15	.....	.....	.....	.....	....	3.30	48
Hampstead B'ham (1924) (trail car)	18.25	11.65	.....	.....	.....	.....	....	3.30	48
Hampstead Metro (1925) (trail car)	.....	.....	.....	.....	.....	.....	....	....	48
Piccadilly standard (control trailer)	17.35	11.32	.....	8.44	8.91	.....	3.01	3.01	52
Piccadilly Cammell (1920) (control trailer)	18.75	13.02	.....	9.14	9.61	.....	2.86	2.86	44
Bakerloo standard (control trailer)	18.60	12.57	.....	9.07	9.53	.....	3.01	3.01	52
Bakerloo joint stock (control trailer)	21.85	15.45	.....	10.54	11.31	.....	3.20	3.20	48
Hampstead standard (control trailer)	17.10	11.08	.....	8.32	8.78	.....	3.01	3.01	52
Hampstead Metro (1923) (control trailer)	18.92	12.21	.....	9.14	9.79	.....	3.38	3.34	44
Hampstead Cammell (1924) (control trailer)	19.54	12.74	.....	9.21	10.32	.....	3.42	3.38	44
Hampstead Metro (1925) (control trailer)	19.76	13.05	.....	9.38	10.38	.....	3.38	3.34	44

(*a*) Trail car converted to motor car.



The latest type of tube car has its main sash fixed to keep out noise and has an inswinging upper sash. The drawing shown is of a trail car

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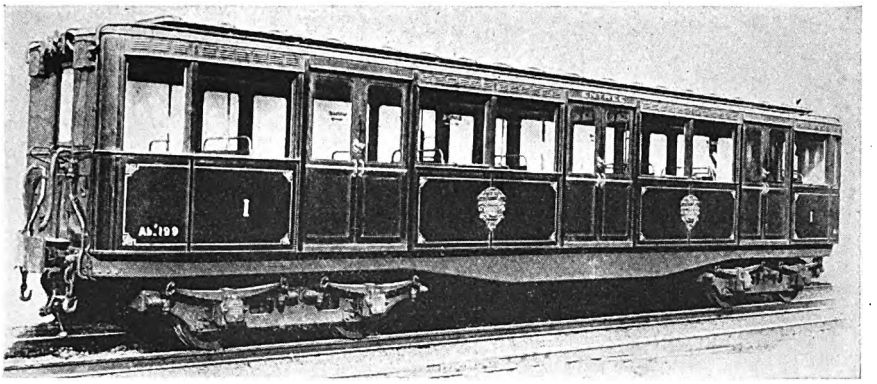
passengers are provided with handles inside and outside for opening the doors, they can do so only when the train guard has set his control switch to the door-unlocked position. This he does in normal operation only when the train has entered a station. Once the doors are open they remain so until closed by the guard.

The operation of these inside and outside door handles are independent of each other because passengers at a crowded station were accustomed to hold the doors closed to prevent passengers on the platform from entering the car. While the handles are at the usual height, the latch is at the top of the door and is connected to the handles by levers. The purpose of this arrangement is to remove from the side of the door any sharp projection which might tear the clothing of passengers during entrance or exit.



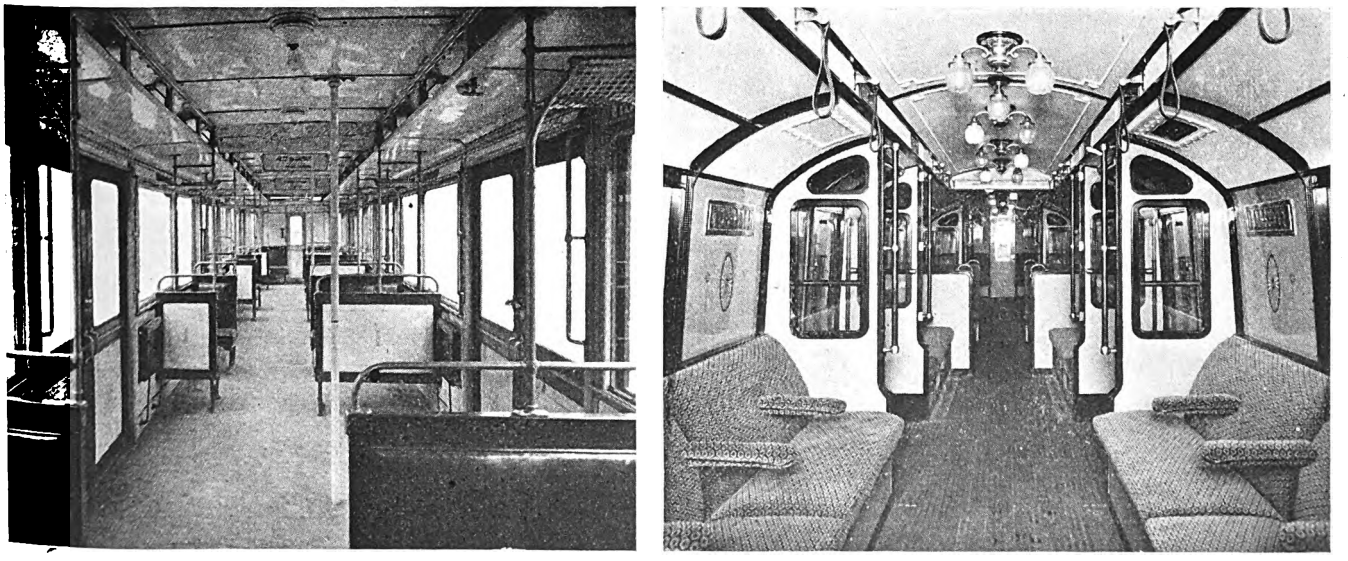
The Paris subway cars have three side doors and passengers are expected to enter by the center door. This is a first-class trailer. The class is indicated by the color (red) and also the numeral "I" on the side

In the Paris type, the doors are opened by the passengers but are closed by the motorman after a train leaves the station, through electrically controlled air cylinders. The doors are equipped with an ordinary latch, and when they come together with considerable force, under the action of this air cylinder, the latch drops into place through impact. On some of the new cars the doors are interlocked with the control so that the train will not start until all the doors are closed. On the older cars there is no interlock and passengers can open the doors from the inside or outside without any warning to the motorman.

Two-Fare Cars in London and Paris

The tube or deep underground railways in London operate only one class of car, but on the shallow London underground lines, the Metropolitan and Metropolitan District, there are two classes. They are marked respectively first and third. The retention of these names is in line with the practice on most of the steam railroads in England, which originally operated three classes of cars, first, second and third, with different rates of fare. The second class was abolished on most of the steam railroads years ago, and the Metropolitan and Metropolitan District Railways, being old steam roads, have adhered to the "first" and "third" arrangement. The seats in the first-class cars are upholstered somewhat more luxuriously than those in the third class, and the outside is painted a different color so that the first-class cars can be recognized readily as they enter a station. On a six-car train on these two London lines the standard arrangement is to run two first-class and four third-class cars, the first-class cars being the second and fifth in the train, counting from either end. In a seven-car train there are three first-class cars, and they are placed in the second, fourth and sixth positions, counting from either end. The policy of the London company is to use moquette upholstery for all cars.

In Paris two classes of cars, first and second, are operated in all trains. They are of different exterior coloring so passengers can readily distinguish them when they arrive at a station and they are always in the same positions in the trains. The number of passengers paying first-class fares in Paris last year were 11.19 per cent of the total, though they contributed 16.29 per cent of the receipts. The standard trail car on the Paris Metropolitan line weighs 43,120 lb. and has a rated carrying capacity of 38 seated and 69 standing when used as first class and 38 seated and 72 standing when used as second class. An interior view of one of these cars is published. The motor car has slightly fewer seats because of the space occupied by the motorman's compartment. The



European rapid transit cars provide plenty of standing space. At left, Paris Metropolitan car; at right, latest type of London tube car

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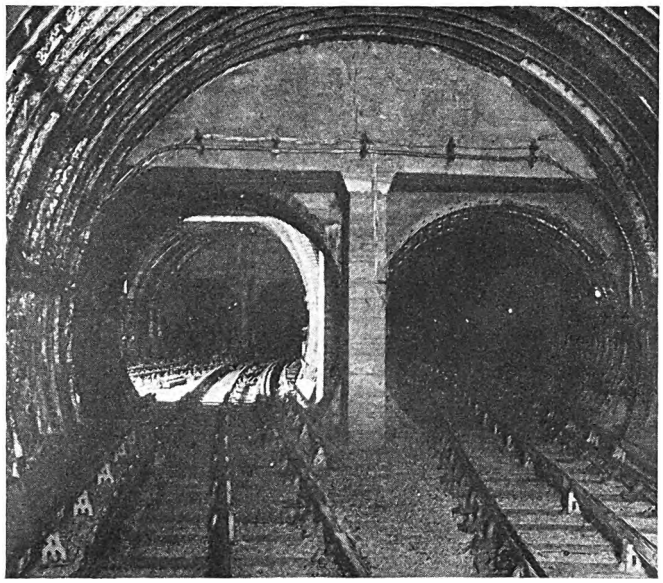


The London tubes are tubes in fact as well as in name. Larger diameters are used at junction and stations

proportion of higher-fare cars in a Paris train is always less than 50 and may be only 25.

In Hamburg and Berlin the rapid transit lines have only one class of fare. In Berlin it was the practice until recently to operate two classes of cars, but now those which formerly were the higher fare cars are used for smoking while the former lower fare cars are for non-smokers. Interior fittings are alike and all seats are being upholstered in imitation leather. Further particulars of these cars were given in last week's issue.

Noise Reduction Experiments in London

Of all the rapid transit lines abroad a greater study of the causes of noise reduction has been made by the London Underground Electric Railways than by any other. These studies were begun five or six years ago. Special attention was given to the conditions on the company's tube railways as, owing to their constricted section, only slightly larger than the car, it was thought the noise in them was somewhat greater than in the larger tunnels of the company, like the Metropolitan District Railway. The results of these early tests were published in this paper during 1924, particularly in the issues of Jan. 26, March 29 and Sept. 20.

Since the conclusions then reached were made public the company has had an experience of more than three years with various remedial measures. As some of the arrangements have been materially altered a review of the situation will be given, together with some particulars of the latest type of tube car, and comments on the relative amount of noise in operation of European surface cars as compared with those in the United States.

It is believed by the management of the London Underground Electric Railways that the principal noise produced by its trains comes from the motors, gears and wheels. The company's first efforts were to reduce the volume of noise. Later efforts, which have been directed to keeping the noise out of the cars, may be divided into two parts, namely (1) to retain the noise in the place where it is generated and (2) to keep it from entering the car.

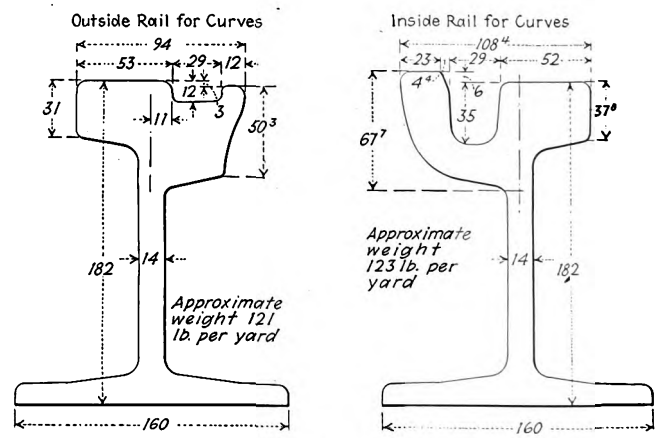
To gain the first mentioned object, i.e., to retain the noise at the point where it is generated, a sort of skirt was built around the truck. This skirt consisted of a screen made of ferrodo or composition board, carried as near the live rail as possible. While this gave fair results, it was looked upon as being somewhat of a fire risk. It was also inconvenient when an examination had to be made of the equipment. Moreover, it was found that much of the noise from beneath the car could be eliminated by better truck design. Hence, special attention has been given in the later types of trucks to see that they have fewer parts and better springs. The decision in regard to springs was reached after a moving picture had been taken of a truck while it was running at high speed. This picture showed that the truck proceeded by leaps and bounds. The more resilient springs in the present trucks are designed to reduce the length of these leaps and the reduction in parts to reduce the number of them which would rattle. It was found that even in the open a truck would be noisy if the springs were stiff.

A great deal of noise in trucks was found to come also from the gears, and some from the motor brushes. The remedy here, in the opinion of the engineers of the company, is better design and maintenance, particularly better maintenance.

The efforts made to reduce noise in car bodies were similar to those made with trucks, namely (1) to reduce the noise, (2) to keep it where it was generated and (3) to prevent it from entering the inside of the car.

In damping the noises on the car frame use was first made of air-cell or sheet asbestos. This was installed to a thickness of $\frac{3}{8}$ to $\frac{1}{2}$ in. between the inside and the outside car panels. Some of it was also put under the floor and some in the roof. In the form in which it was used, however, it was found to be hydroscopic, i.e., it absorbed moisture and tended to rust the metal parts against which it was placed.

An effort was then made to cover these parts, particularly the inside of the outer panel, with a film of lead to prevent rusting, but finally the use of sheet asbestos was abandoned for open mesh cotton scrim. It is believed that the use of this material, well cemented on the noise-producing or reflecting parts like the sash, panels, floor and ceiling, will stop their tendency to drum. This material also helps to hold the paint. It is attached with marine glue. In the flooring the scrim is placed under the wooden flooring and the wood is treated for fireproofing. In the latest cars the ceilings are non-metallic, so that it is not considered necessary to use this material there.



The Paris surface lines use a shallow groove for the outside rail of all curves up to 90-ft. radius. It reduces friction and noise from cars passing around curves

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All cars built since 1923 up to last June, 444 in number, have been constructed in this way. The same protective measures have also been adopted for 100 cars of the District Railway, owned by the same company. In these cars the scrim is attached to the side sheathing. The company has also tried strips of asbestos fabric boiled in oil, so as not to be frictional, and attached to the foundation and hand brake rigging and a few other places where there might be a chatter.

Cutting off Entrance of Noise into Car

So much for noise reduction. The other recourse in the company's policy is to prevent the noise generated from getting into the car. If the passengers could be sealed within a car they would probably hear very little noise. This is impracticable. The next best plan is to reduce the amount of noise that gets in at the windows and elsewhere.

Originally the windows were arranged to drop, but it was found that passengers would keep them open unnecessarily. Now the sash is fixed, but above the main sash is a narrow sash, the width of the lower window, and hinged so as to swing inward. This sash is normally kept open and is found sufficient to give air as well as to keep out the rain when the car is outside the tunnel, but it is not large enough to admit as much noise as if the entire window was open. Another step to keep out the noise has been to make the window areas smaller and the glass in them thicker. A change was also made in the ventilators by arranging their passageways to be tortuous.

The company has constructed instruments for measuring noise, but while these instruments determine the volume of the noise produced, they cannot measure the irritating effect of the noise on the passengers, the degree of which, it is believed, depends not only on the volume, but to a considerable extent on the musical pitch of the noise. Thus, a note which compels persons to raise their voices while talking with others is tiresome, whereas a noise which does not require this would probably be less irksome to most persons. It has been found that in small tunnels there is more vibration and consequently more noise than in larger tunnels, like the District tunnel.

Little Noise from Surface Car Operation

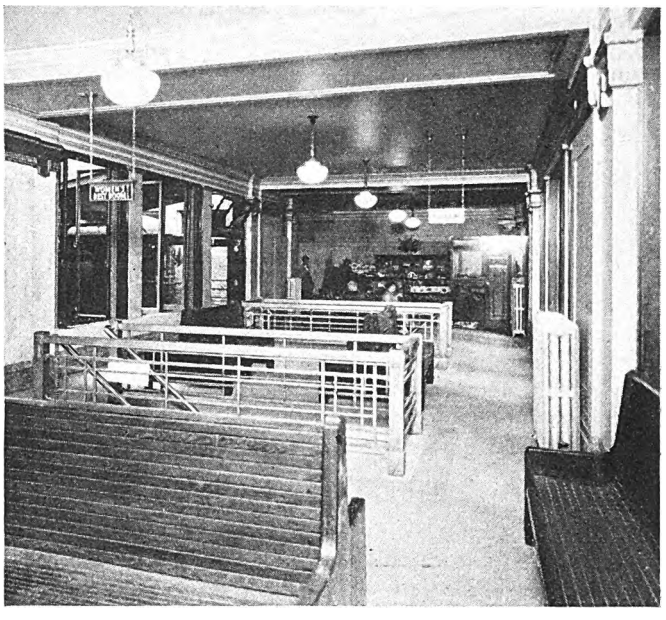
Outside of these experiments in London the European electric railways do not seem to have given any special attention to noise reduction. Nevertheless, the surface cars in Europe are noticeably less noisy in operation than those in the United States. This fact was noticed and commented on by the 1924 Committee on Foreign Operation of the American Electric Railway Association, whose report was published in the Electric Railway Journal for Sept. 20, 1924.

Among the reasons given by that committee for this condition are better maintenance of cars and track, slower speed of cars, use of wood in car construction, extended employment of fixed window sash and lower weight of cars. To these might be added the more common use in Europe of manganese flange-bearing special work, and in some cities the use of manganese flange-bearing rails for outsides of all curves up to 90 ft. This is the practice in Paris. Where such rails are not used a great deal of attention is usually given to greasing the sides of the rails in curves to prevent squealing and friction. This is the practice in Berlin.

Chicago's Wells Street Terminal Opened

WORK on the new $250,000 Wells Street terminal of the Chicago Rapid Transit Company was completed in time so that the station was officially opened on Aug. 1. It is now serving the thousands of west side and west suburban residents who daily enter and leave the Chicago Loop at that point. The new structure also provides a modern and spacious Loop terminal for the Chicago, Aurora & Elgin Railroad, serving the Fox River valley and other points west of Chicago.

On the first floor of the terminal is the main lobby, containing the Chicago, Aurora & Elgin Railroad ticket offices and baggage checking room, twenty telephone booths, rest rooms, a restaurant and a soda fountain



Entrance to station platforms and trains is from the third floor waiting room in the new Wells Street terminal of the Chicago Rapid Transit Company

concession. The second and third floors are "L" shaped, being constructed around the Chicago Rapid Transit Lines elevated structure. The north wing of the second floor includes a trainmen's room, with connection to the platform. Half of the east wing provides offices for the Chicago, Aurora & Elgin Railroad, while the other half contains a women's rest room and men's smoking room. On the third floor, which is reached either by elevator or stairway from the first floor, is a large waiting room. This room, located at platform level, gives access to all trains. Direct connections with the Rapid Transit Lines are made at the Quincy and Wells station of the Loop, which is reached by a glass-inclosed bridge extending over the sidewalk.

Walls and columns of the new station are of pink Tennessee art marble, with bronze capitals and old ivory cornices and ceiling. The floors are of terrazzo. Ticket booths are finished in bronze. A feature of the station is a system of electric amplifiers through which trains are announced throughout all parts of the building. The front of the building is designed in terra cotta and the rear of the structure adjacent to the tracks and platforms is of old English mission brick. Architect A. U. Gerber designed the new terminal.

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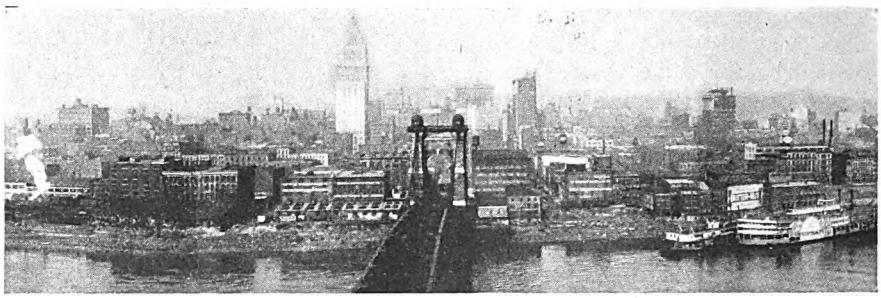

Cincinnati's business district as it is today

Co-ordination Essential for Rapid Transit in Cincinnati

ARTICLE II

This, the second and concluding article on the Beeler report to the city of Cincinnati, shows the traffic that can be developed by the rapid transit line with various plans for operation. Only if the line is co-ordinated with the existing transportation can a profit be obtained

LAST week's article on the report of the Beeler Organization on rapid transit facilities for Cincinnati showed that the unfinished line should be completed with minor modifications, but that it should be extended to Fountain Square on the downtown end and to Oakley on the outer end. Following this discussion the report continues to show how the traffic was estimated and the financial results calculated. The following article, largely an abstract of the report, completes the presentation of the plan recommended.

A number of interesting methods were used to determine the probable rapid transit traffic and the loading at the various stations. Based on the riding on the street railway and the local bus lines, 5,045,379 rides would be made annually directly on the rapid transit line, 18,868,442 with one transfer and 11,532,230 with two transfers, making a total of 35,446,051 annual riders. The daily loading is shown in the traffic charts.

Standard gage track, laid with 100-lb. rail on treated ties in ballast, was recommended, with a third rail at 600 volts d.c. for power supply. A complete signal system was considered essential, including interlocking switches and signal towers

The car recommended is 49 ft. 11 in. long and 10 ft. wide. The locations of the doors are such as to facilitate rapid interchange of passengers. The car should weigh about 26 tons. It will seat 50 or 52 passengers, have a comfortable loading capacity of 162 and a maximum capacity of 200. Each car will be equipped with two 100-hp. motors. The manufacturers state that

Recommendations for Cincinnati Transit Summarized

1. Merge all street railway and bus lines with rapid transit system.
2. Extend existing subway to Fountain Square.
3. Extend outer end to Oakley.
4. Construct street car line between Madisonville, Mariemont and Oakley station.
4. Relocate Ludlow station in vicinity of Knowlton's Corner.
6. Construct and operate nine stations only on rapid transit line, as designated.
7. Provide prepayment areas for transfer between surface and rapid transit at five stations designated.
8. Adhere to recommendations in report as to schedules, running time and headways to secure fast, frequent and regular service.
9. Secure C., H. & D. Railway as tenant to serve College Hill territory.
10. Follow the changes recommended for street car and bus lines to co-ordinate with rapid transit and obtain minimum fare.

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this motor capacity is capable of hauling a maximum load of 40 tons at a maximum speed of 45 m.p.h. with an accelerating rate of 1½ m.p.h.p.s. under the conditions pertaining to this line.

The choice of car for Cincinnati lies between the single car with automatic couplers and the two-car articulated unit, since the density of traffic does not justify employing units of more than two-car capacity. The advantage of the articulated unit is chiefly that a given carrying capacity can be secured at lower first cost and the cost of operation is about 9 per cent less than that of equal capacity provided by single units. Its disadvantage is that the articulated unit, having twice the capacity of a single car unit, cannot be adjusted to fit traffic demands so closely as the single car. Because of the greater flexibility and the comparatively low requirements it was recommended that single cars operated in trains be used, although further developments and greater experience with the articulated unit between now and the time the cars will be needed in Cincinnati may justify its adoption at that time.

Eastern water level entrance to the Basin, the central district of Cincinnati

Determining Service Characteristics

Considerable attention was given to determining probable schedules. Intermediate running times were calculated between stations, with sufficient allowance for stops and for coasting to insure efficient operation. For the entire distance of 11.86 miles between Fountain Square and Oakley the total time estimated is 28 minutes. This includes 20-second stops at all stations except Fountain Square, giving an average speed between terminals of 25.4 m.p.h. A 30-second stop is allowed at Fountain Square and a layover of 6½ minutes at Oakley to take care of any unforeseen delays, afford time for changing ends, etc. On this basis each train will complete a round trip in 63 minutes.

A three-minute headway was decided on as meeting the demands for frequency of service. This headway would be maintained all day, except between midnight and 1 a.m. and between 5 and 6 a.m. No service is provided between 1 a.m. and 5 a.m., although it might later be found desirable to keep one train operating on a 60-minute headway during the owl hours. Saturday service is assumed to be the same as that for the other weekdays but it necessarily would have to be distributed somewhat differently.

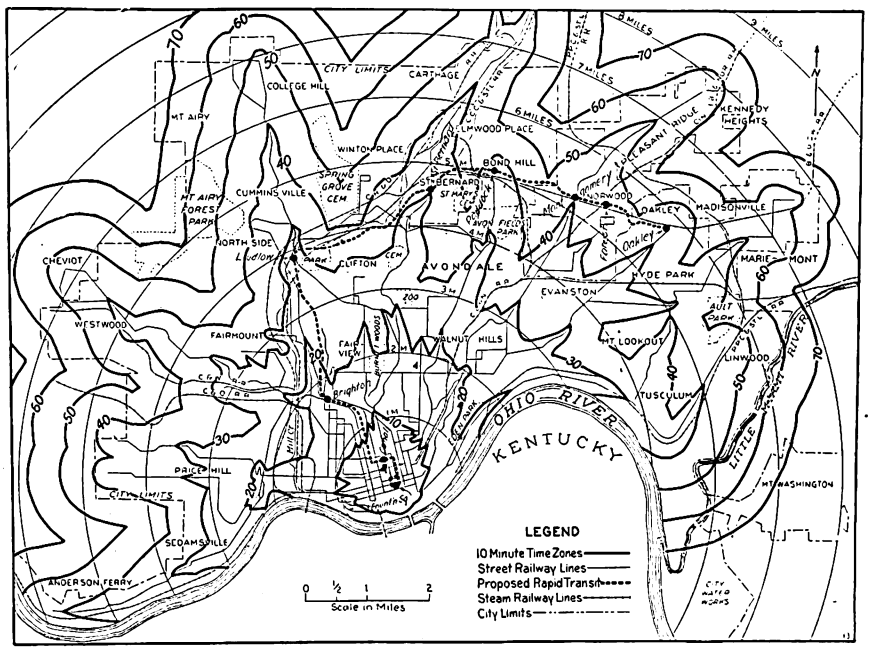
The same number of trips will be operated on Sundays as on weekdays, but it is assumed that single cars will be operated until noon and two-car trains for the remainder of the day. With the proposed schedule it was found that a total of 7,445,684 car-miles will be operated annually, of which 6.3 per cent will be operated with one car, 56.9 per cent with two-car trains, 13.2 per cent with three-car trains and 23.6 per cent with four-car trains. The total car-hours corresponding to this would be 330,886 annually, allowing for pull-outs and pull-ins.

The number of train-hours shows that 390 hours 9 minutes would be operated on weekdays and 388 hours 9 minutes on Sundays and holidays, making a total of 142,286 train-hours annually. This figure represents the number of hours that a motorman and a conductor will actually be on duty on a train. Adding time for reporting and for pull-outs and pull-ins made by the regular

TABLE I—SURFACE EQUIPMENT ON LINES AFFECTED BY RAPID TRANSIT PLAN

	Present	Proposed	Reduction
Street railway cars:			
A. M. rush period	290	260	30
Base	126	114	12
P. M. Rush period	312	280	32
Street railway buses:			
A. M. rush	49	38	
Base	28	26	
Base	51	38	
Independent buses:			
A. M. rush	84	0 (*a*)	95 (*b*)
Base	79	0 (*a*)	81 (*b*)
P. M. rush	84	0 (*a*)	97 (*b*)
Total cars and buses:			
A. M. rush	423	298	125
Base	233	140	99
P. M. rush	447	318	129

(*a*) None shown because merged with unified system.
(*b*) Includes reduction in street railway buses.



Time zones from Fountain Square using present street car lines

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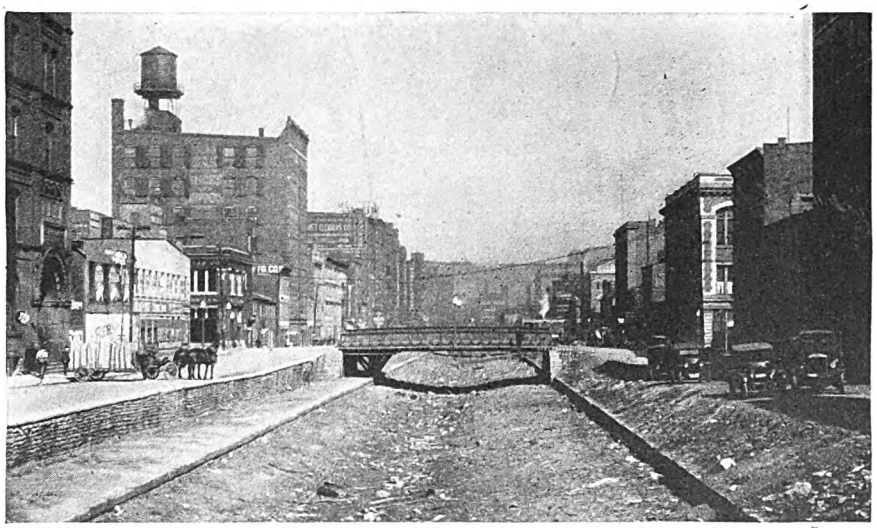


Old canal bed at Race Street bridge, before construction of rapid transit line began

crews brings this up to 148,686 hours. This is practically the pay hours for motormen and conductors required to operate the system because with no extra trainmen required for rush-hour trips, this service being cared for by operating more cars in a train without added men, there should be little time to be paid for which does not represent active duty.

The maximum car requirements occur in the evening rush hours, when 21 four-car trains, or 84 cars, will be in service. As cars will be out of service at certain periods for repairing and general overhauling purposes it has been estimated that 90 single-car units should be purchased.

Time Saving Essential

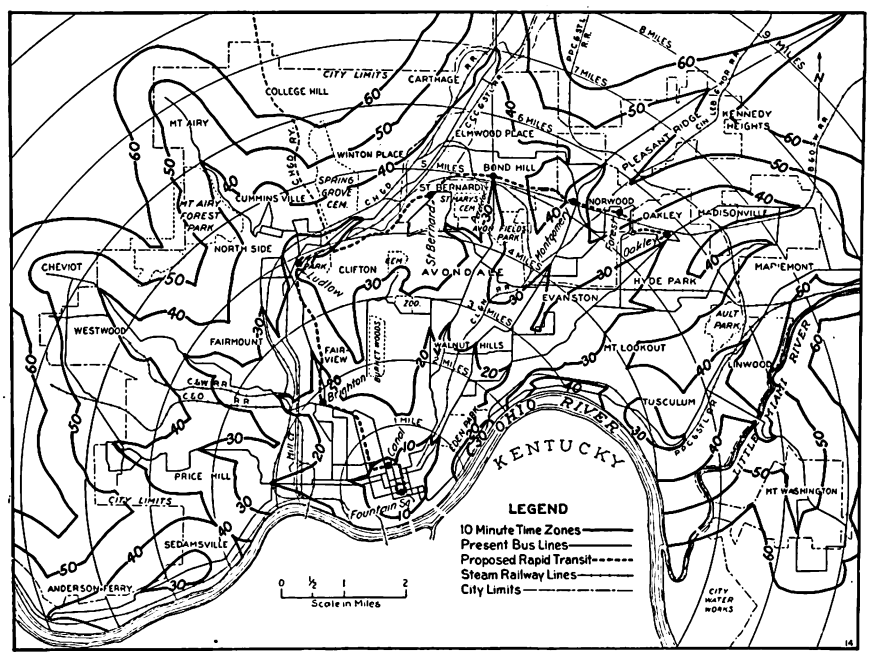
Since time saving is one of the essential benefits of rapid transit, three time maps were prepared to show the time from Fountain Square to all other parts of the city. Similar information is given in Table II. A very appreciable saving will be made in the time to reach all rapid transit stations as compared with existing facilities. Where a transfer to surface transportation lines must be made, the saving varies. The time for a trip by street car or bus now is little different until a point between the 20 and 30-minute zones is reached. Beyond the 30-minute zone the bus shows an appreciable saving if topographical conditions are favorable, although it should be remembered that the buses accomplish most of their time saving by running express and not accommodating local business.

The value of the time saved to riders who may use the rapid transit line is perhaps intangible. On an average each rider will save approximately 11.7 minutes each trip. This means that the rapid transit will save its patrons about 7,400,000 hours annually which they may use for work, rest or play. If time is worth 50 cents an hour the saving would mean some $3,700,000 per year to the citizens of Cincinnati.

Operation of the rapid transit system will be possible only provided all local transportation facilities are unified into one comprehensive system, and if there is a retention by the unified system of all riders now using cars and buses. Practically all lines, both street car and bus, will be affected. On some lines it will mean a slight change in load only, brought about by transfer of riders to the new high-speed line. In territory served directly by the rapid transit line 26 out of 40 car lines will be affected. Six of the nine company bus lines and twelve of the sixteen independent bus lines are likewise affected.

An analysis of the present service was made to determine the demand for transportation under the changed conditions. Three-fourths of the independent bus lines are now operating in what will be rapid transit territory. With the advent of rapid transit the field for these bus lines will be filled by it, as patrons will find it quicker than other means. An analysis of the business shows that 49.1 per cent are potential riders on the new line. The losses sustained by the bus lines will vary from 31 per cent to 100 per cent. With half of the bus business going to the rapid transit, operation of independent bus lines will no longer be justified or sufficiently remunerative to be continued. Some of the routes could be shortened and in that way continue to compete with the railway lines for the short-haul business. This would result either in wasteful duplication of service or drastic curtailment, either of which would be undesirable. Even if the independents could continue to operate, most of them would be of little value to the community served because they could not give their patrons the privilege of transferring to the rapid transit line, for at the outer ends of the lines their present traffic would find quicker service by the rapid transit line, while patrons along the inner sections of these lines would find little or no saving in time over street cars.

The present lines that will be affected by rapid transit and the pro-



Time zones from Fountain Square using present bus lines

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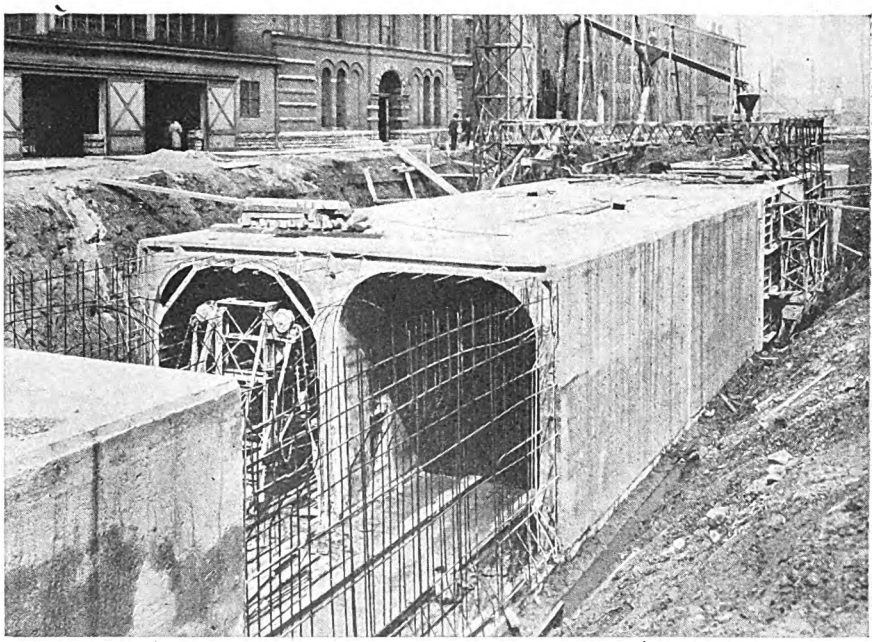
posed rearrangement are shown in two maps on page 596. Three car routes should be discontinued and two new ones added. Seven present car routes should be revised to fit in with the new conditions. Three railway bus routes should be discontinued. Two independent bus routes should be continued but modified, and five new bus routes should be established to feed into the rapid transit stations. Two other bus routes should be revised. Eleven independent bus routes should be discontinued entirely and the passengers cared for by new lines feeding into the rapid transit stations and by the present street railway lines. Two suburban bus lines should be shortened, their city terminals to be at rapid transit stations. The report devotes considerable space to the details of the various routes, and indicates the exact changes that should be made in each. A summary of the cars and buses required under the present and proposed arrangements is shown in Table I. There will be a maximum reduction of 32 street cars and 97 buses, while the rapid transit system will require a maximum of 84 cars, none of which will be on the street surface or in any way interfere with or be interfered with by street traffic. The result of this should be a marked improvement in street traffic conditions in which the balance of street railway system, its patrons and the public generally will participate. The saving in car and bus-miles, and the additional rapid transit car-miles, will be considerable. There will be a direct saving of 1,300,000 street car-miles and nearly 6,000,000 bus-miles with the addition of approximately 7,500,000 rapid transit miles. Some 300 fewer round trips by street cars into and out of the Basin, as well as some 1,300 fewer motor coach trips, will be made daily.

Under the rearrangement, operation will be discontinued over 11.37 miles of surface track. The cost of rehabilitation of this track would be from a minimum of about $166,000 to possibly twice that amount, which would have to be expended immediately. The value of the track must no doubt be amortized during the life of the franchise. It is estimated that the amortization charge would be approximately $14,000 annually.

Approximately 3.19 miles of new track must be built at a cost of $200,000. Assuming a 20-year life the annual amount required for renewal and retirement would be $10,000.



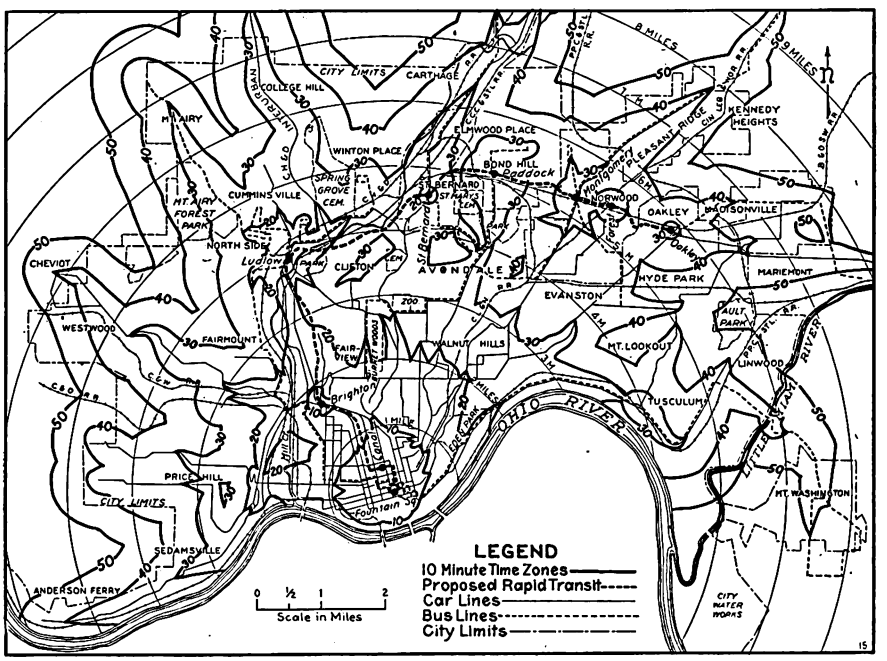
Central Parkway near Odeon Street. This shows a typical section of the subway line as constructed in the canal bed

TABLE II—COMPARATIVE RUNNING TIME AND DISTANCES VIA STREET CAR, MOTOR BUS AND RAPID TRANSIT LINE

	Running Time, Via				Distance, Miles		
Station	Street Car Min.	Motor Coach Min.	Rapid Transit Min.	Rapid Transit Sec.	Street Car	Motor Coach	Rapid Transit
Brighton	15	15	6	00	2.15	2.44	2.22
Ludlow	28	25	11	40	4.75	5.15	4.80
St. Bernard	30	..	17	21	5.15	....	7.33
Paddock	36	30	20	05	5.80	5.80	8.56
Montgomery	40	36	23	31	6.15	5.94	10.11
Forest	43	40	25	19	6.70	6.50	10.65
Oakley	42	35	28	00	6.62	6.55	11.86

TABLE III—SAVINGS IN OPERATING STREET RAILWAYS ALONE

		Annual Costs
Saving in surface railway operation if unified system can divert traffic to rapid transit line		$312,250
Saving in bus operation		120,012
Total saving		$432,262
Amortization of abandoned track	$14,000	
Renewal and retirement of new track	10,000	
Deduct total added charges		24,000
Net annual saving		$408,262



Time zones from Fountain Square using rapid transit and co-ordinated surface transportation facilities

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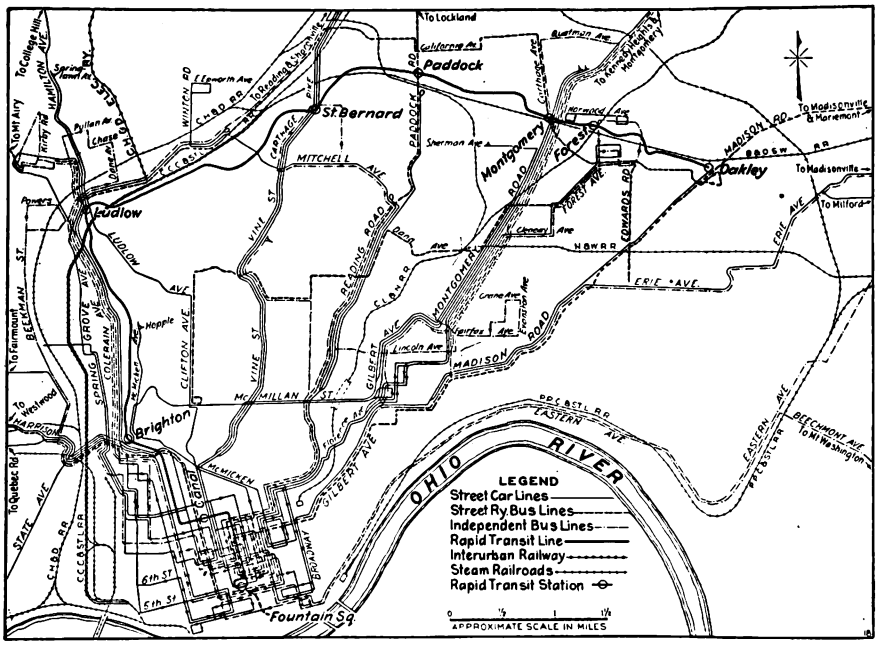


Present street car and bus lines affected by rapid transit line

Analyses of the savings to the street railway alone in surface operation according to the proposed plan show the summarized annual figures as given in Table III.

The net annual saving is applicable toward the payment of the operating expenses of the rapid transit line.

TABLE IV—ANNUAL OPERATING COST OF RAPID TRANSIT LINE ALONE

Maintenance of way and structures	$83,500
Maintenance of equipment	162,000
Power	247,500
Trainmen's wages	200,714
Other transportation	123,000
Injuries and damages	55,843
General and miscellaneous	40,000
Depreciation reserve	149,945
Total	$1,062,504

With the unified system and a discontinuance of excess competitive service 5,311,433 less miles would be operated annually by the independent buses, and this would be an additional economic saving to the community under the service-at-cost plan.

With the characteristics of the proposed rapid transit line determined, the estimate of the cost of operation given in Table IV was made.

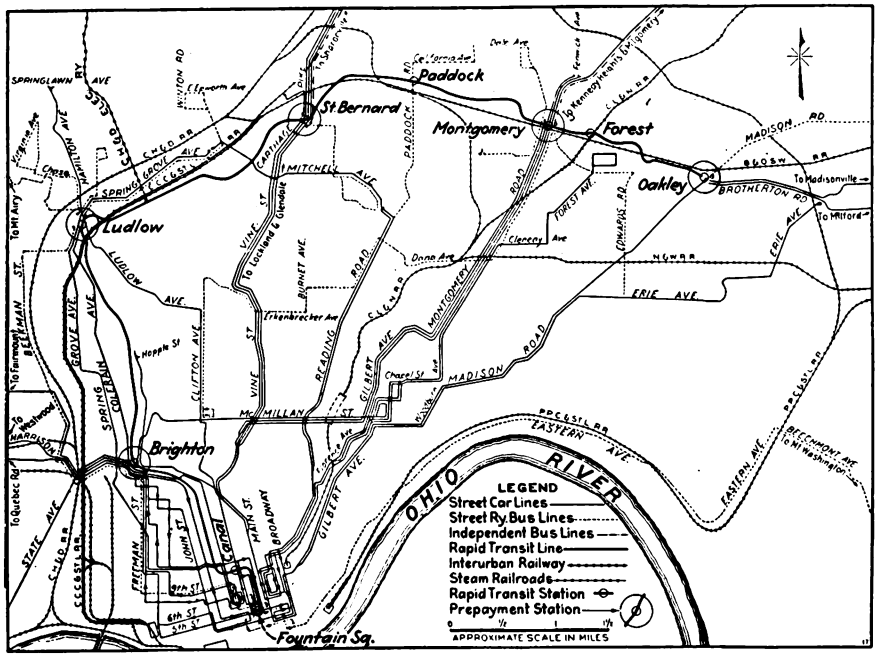
This estimate includes operating the rapid transit line, including train, station and signal service and a sufficient allowance to cover depreciation on all depreciable property. Taxes and fixed charges are not included.

The total estimated cost of completing the rapid transit line, including the extension to Fountain Square, the equipment, real estate and construction for prepayment stations, necessary track changes in connection with the prepayment areas, construction of surface feeder track, together with interest, insurance and contingencies during the construction period, is $10,606,960. Details are given in Table V on page 597.

Under any feasible plan of operation a rapid transit line cannot be made to pay from the start; neither can the true value of such an enterprise be determined solely from the financial results. To operate the rapid transit line independently would scarcely pay its operating expenses, to say nothing of interest and sinking fund charges. The number of passengers to be carried under present conditions would be but about 6,060,000 annually. The plan for unification of all the local facilities, street cars and buses, into one comprehensive system is the only practicable solution. Were this plan effective now some 38,000,000 riders would use the rapid transit line to advantage as they would save time in making at least a portion of the trip via the rapid transit line. These results can be expected only by adopting the unification plan in full. The service must be fast, frequent and regular.

Strong pressure will undoubtedly be brought to bear for the operation of the rapid transit stations which it is specified should be eliminated. Requests for other stations undoubtedly will be made. To make stops at the four stations eliminated would mean an increase of 4½ minutes in the running time from Fountain Square to Oakley, reducing the schedule speed between terminals from 25.4 to 21.9 m.p.h. Three extra trains would be added, the extra equipment alone costing $270,000. The time lost would destroy the usefulness of the line beyond Norwood and make the extension to Oakley impracticable. In addition there would be a loss of about 4,500,000 passengers annually who would not be attracted to the line.

Were it possible to make the rapid transit plan effective immediately, but with the independent buses continuing in operation, the operation of the unified system would result in a deficit of $845,723 annually, if financed



Proposed routing of street car and bus lines in conjunction with rapid transit line

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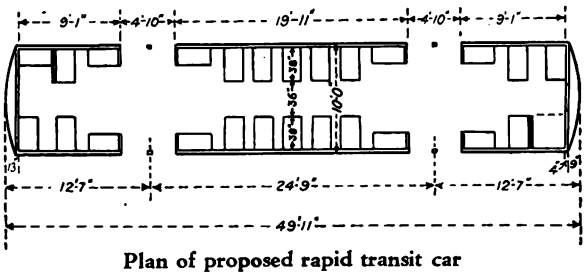
by 50-year serial bonds. On the other hand, could the independent bus lines be merged with the unified system immediately $839,800 additional net revenue would accrue, exclusive of charges on the old rapid transit bonds. If it were possible to secure the new capital requirement under 50-year sinking fund bonds instead of 50-year serial bonds, the deficit of $5,923 would be transformed into a balance of $12,361.

The rapid transit line, however, cannot be put in service before 1930. In the meanwhile, the most important question to be answered is what will result from discontinunig independent bus operation. There is a large investment in the 84 buses of the several independent lines affected by rapid transit, which must be paid for by somebody, and instead of loading up the subway and surface systems with the cost of buying them it might be sounder economics to allow them to be operated for a reasonable time with a definite understanding between the city and the operators that the old equipment must not be replaced when it is worn out. On the basis of completely merging them in 1932, the estimate of Table VI on page 598 was prepared. It will be noted that while the revnue in 1930 is greater than now, operating expenses, taxes and fixed charges will have increased, the latter from $2,171,184 to $2,527,935, this change being due to the increase in the capital charges in the new financing of the street railway and restoring on

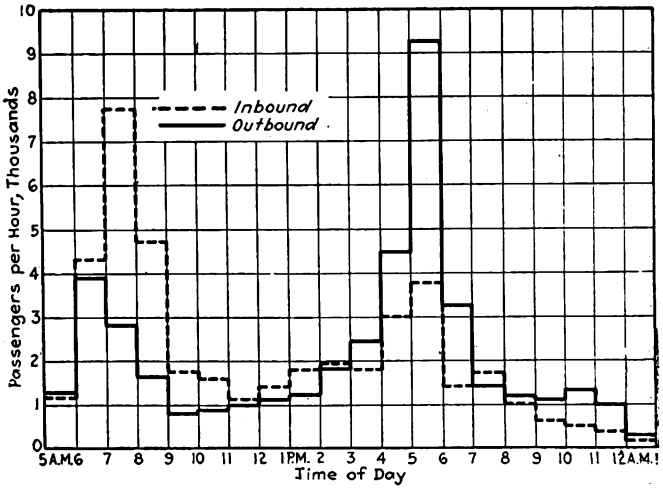


Plan of proposed rapid transit car

Nov. 1, 1928, the dividend rate on the capital stock which for three years was reduced from 6 to 5 per cent under the terms of the ordinance. Because of these factors and on account of the independent buses being yet in

TABLE V—COST OF COMPLETING RAPID TRANSIT PLAN

1.	Construction work, including station, of downtown extension from Central Parkway and Walnut to Fountain Square	$2,600,000
2.	Completing construction work exclusive of track and equipment between Central Parkway and Walnut and Oakley. This includes constructing stations at St. Bernard, Paddock Road, Montgomery Road, Forest Avenue and Madison Road, and completing and finishing stations exclusive of equipment at Race Street, Brighton and Ludlow	720,000
3.	Lighting system for stations and tunnels	125,000
4.	Complete equipment of all stations including heating system	275,000
5.	Complete fire protection for tunnels and stations	90,000
6.	Ventilating system for tunnels and stations	50,000
7.	Fencing right-of-way	10,000
8.	Construction of track with 100-lb. rail, creosoted ties and the necessary special work including cross-overs, yard and shop tracks	600,000
9.	Construction of third rail and bonding of track and third rail	330,000
10.	Complete signal system including interlock track switches, signal towers and automatic block signals	300,000
11.	Distribution systems	285,000
12.	Expense necessary to provide for car storage, yards, shop facilities, etc., on property of the Cincinnati Street Railway at Mitchell Avenue	100,000
13.	Passenger car equipment	2,025,000
14.	Service and work car equipment	100,000
15.	Real estate for prepayment stations	750,000
16.	Construction of prepayment stations including fixtures and track changes	500,000
17.	Relocating line at Knowlton's Corner including construction of roadway and station, right-of-way and damages	716,000
18.	Construction of surface line connection between Madisonville and Oakley	125,000
19.	Construction of surface track additions and changes recommended at Ivorydale and on Freeman Avenue	75,000
	Total	$9,776,000
20.	Interest, insurance and contingencies during construction at 8½ per cent	830,960
	Grand total	$10,606,960



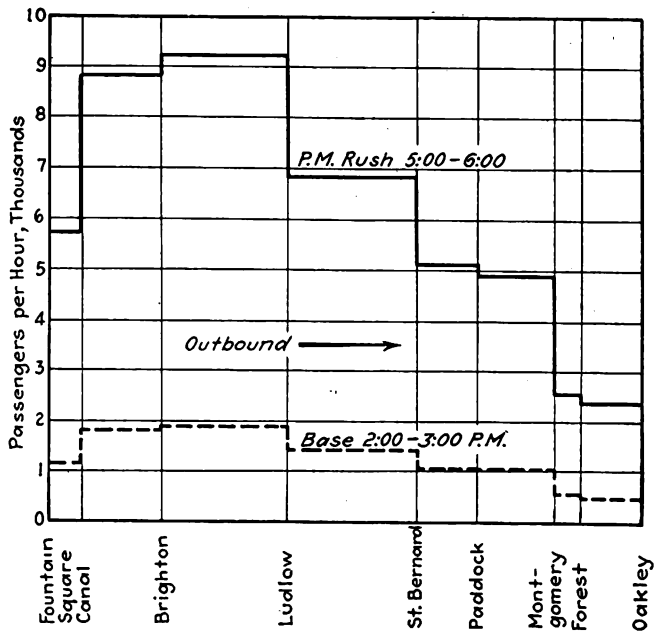
Hourly load demand at point of maximum traffic, rapid transit line

partial operation, a net deficit of $246,111 will result for the year 1930. In the future, as traffic expands more will be added to plant and equipment account, which will still further increase these charges.

As operations continue, more and more business will gravitate to the rapid transit line. The year 1932 at least should witness a complete cessation of independent bus operations. In that year there should be a balance of $136,704 from operation, which would be applicable to payment on the principal of the rapid transit debt. During 1933 a balance of $243,824 is shown, and this increases at the rate of approximately $120,000 per annum.

Alternate Plans Considered

Several alternative plans were considered. These include the operation of the rapid transit line independently and also with its own system of bus feeders, but without any connection with the street railways. Operation of the present subway without the extensions proposed was figured for each of the test combinations. In all six plans were prepared. The comparative results for 1930 are given in Table VII, page 598. Plan No. 1



Maximum load demands in afternoon rush outbound, rapid transit line. The inbound morning loads are quite similar

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TABLE VI—ESTIMATED RESULTS OF FUTURE OPERATIONS UNIFIED SYSTEM SURFACE AND RAPID TRANSIT

	1930 (*b*)	1931 (*c*)	1932	1933	1934	1935
Revenue						
Combined surface and rapid transit	$9,544,185	$10,297,425	$10,844,000	$11,178,000	$11,511,000	$11,845,000
Operating expenses	6,666,000	7,160,000	7,480,000	7,666,000	7,827,000	7,995,000
Taxes	808,500	826,600	843,100	856,100	870,100	884,100
Net after taxes	2,069,685	2,310,825	2,520,900	2,661,900	2,813,900	2,965,900
Fixed charges						
Street railway	1,865,000	1,897,000	1,929,000	1,961,000	1,993,000	2,025,000
Net for rapid transit	204,685	413,825	591,900	700,900	820,900	940,900
Fixed charges						
Rapid transit (*a*)	662,935	670,858	678,003	685,202	692,186	698,932
Net after all charges (*a*)	(*d*)458,250	( )257,033	( )86,103	15,683	128,714	241,968
Deduct payment on principal of rapid transit bonds	212,139	217,473	222,807	228,141	233,475	238,809
Net after all charges exclusive of money applied to purchase of rapid transit system (*a*)	(*d*)246,111	( )39,560	136,704	243,824	362,189	480,777

(*a*) Includes interest and payment on principal under 50-year serial bonds to cover new capital necessary to complete rapid transit plan, but does not include fixed charges on old rapid transit investment of $6,100,000. (*b*) Assumed that independent buses will carry 7,500,000 passengers during year.
(*c*) Assumed that independent buses will carry 2,500,000 passengers during year. (*d*) Deficit.

is the one adopted, and which has been discussed in detail in the report.

While requiring the greatest amount to complete, Plan No. 1, the one recommended, is in reality the cheapest. Its net deficit is less and it furnishes the most comprehensive and economical solution of the city's transit problem. Plan No. 2, without the extensions, but with unified operation, would show nearly twice the net deficit. If considering only the amount of money to complete the rapid transit line, Plan 3, which calls for independent operation without the extensions, requires only $4,386,330 additional capital. The cheapness is only apparent, as its operating expenses alone would exceed the revenue by 27 per cent. The net deficit would be even greater than that of Plan No. 1, which would carry ten times as many riders.

The deficits under plans No. 4 and No. 6 indicate clearly that if the rapid transit were to be operated as an independent line it would not support its own system of feeder lines to bring patrons to it under the present rate of car fare. A comparison of plans No. 1 and No. 2 with the others shows that the construction of the rapid transit extension to Fountain Square is well justified from a purely financial standpoint. It should also be remembered that the plan carrying most passengers will tend to improve its earning ability faster. The plan recommended, No. 1, will serve 66 per cent more people than any of the remaining five plans.

Since the Cincinnati Street Railway is operating under a service-at-cost franchise the people of the community have a direct interest in any matter influencing the business. For this reason the estimated results of operation of the various plans were carried out to determine the effect of each on the operations of the street railway. Any of the plans for independent operation of the subway would throw additional burdens on the street railway.

Some attention is given in the report to methods of financing the rapid transit project other than the issue by the city of bonds under its present financing arrangement. It is pointed out that property values in uptown Manhattan increased more than 100 per cent in seven years, due largely to the installation of a rapid transit line. More recent lines have caused even greater increases. For this reason attention is called to the plan recommended in Pittsburgh and approved at a referendum by the voters of Detroit.

Briefly, the plan approved in Detroit divides the cost for financing the project into (a) the cost of what is termed permanent way, which in general includes construction cost, and (b) the cost of equipping the systems, which, as the name implied, includes the cost of all equipment necessary to operate the system. The cost of the latter is the car rider's proportion of the total cost, and is collected by charging a fare that will pay the cost of operating the service and of fixed charges on the equipment. The cost of the former, i.e., construction cost, is apportioned between the benefited property owners and the general taxpayer, the former paying 75 per cent and the latter 25 per cent. As worked out in Detroit, the benefited property owners pay 51 per cent of the total cost, the car riders 32 per cent and the general taxpayer 17 per cent. Since in Cincinnati charges on the old rapid transit bonds are all being paid for by the general taxpayer, it is believed to be only fair and just to all concerned that at least a part of the new capital requirements be secured by a direct assessment on the benefited property owners, and it is suggested that careful consideration be given this method as a means of partially financing the rapid transit line.

TABLE VII—COMPARATIVE RESULTS—VARIOUS RAPID TRANSIT PLANS—ESTIMATES FOR THE FIRST YEAR OF OPERATION—1930

	Unified Operations		Independent Operations			
	Fountain Square to Oakley Plan No. 1	Central Pkwy Walnut to Oakley Plan No. 2	Central Parkway and Walnut to Oakley Rapid Transit No Feeders Plan No. 3	Central Parkway and Walnut to Oakley Rapid Transit Bus Feeders Plan No. 4	Fountain Square to Oakley Rapid Transit No Feeders Plan No. 5	Fountain Square to Oakley Rapid Transit Bus Feeder Plan No. 6
Total revenue passengers	110,350,000	105,490,000	3,636,227	8,355,043	6,060,379	13,925,072
Using rapid transit	37,400,000	22,460,000	3,636,227	8,355,043	6,060,379	13,925,072
Cost of completing plan	$10,606,960	$6,946,930	$4,386,330	$6,350,180	$7,582,523	$9,708,580
Revenue from operation	9,544,185	9,121,155	354,630	756,830	569,330	1,239,400
Operating expenses	6,666,000	6,572,860	449,967	962,666	495,058	1,068,703
Taxes	808,500	803,424	4,256	9,082	6,832	14,873
Net after taxes	2,069,685	1,744,871	(*d*)99,593	(*d*)214,918	67,440	155,824
Fixed charges						
Street railway	1,865,000	1,865,000	.....	.....	.....	.....
Net for rapid transit	204,685	(*d*)120,129	(*d*)99,593	(*d*)214,918	67,440	155,824
Fixed charges						
Rapid transit (*a*)	662,935	434,183	274,146	396,886	473,908	606,786
Net after all charges (*a*)	(*d*)458,250	(*d*)554,312	(*d*)373,739	(*d*)611,804	(*d*)406,468	(*d*)450,962
Deduct payment on principal of rapid transit bonds	212,139	138,939	87,727	127,004	151,650	194,172
Net after all charges exclusive of money applied to purchase of rapid transit system (*a*)	(*d*)246,111	(*d*)415,375	(*d*)286,012	(*d*)484,800	(*d*)254,818	(*d*)256,790

(*a*) Includes interest and payment on principal under 50-year serial bonds to cover new capital necessary to complete rapid transit plan, but does not include fixed charges on old rapid transit investment of $6,100,000. (*d*) Deficit.

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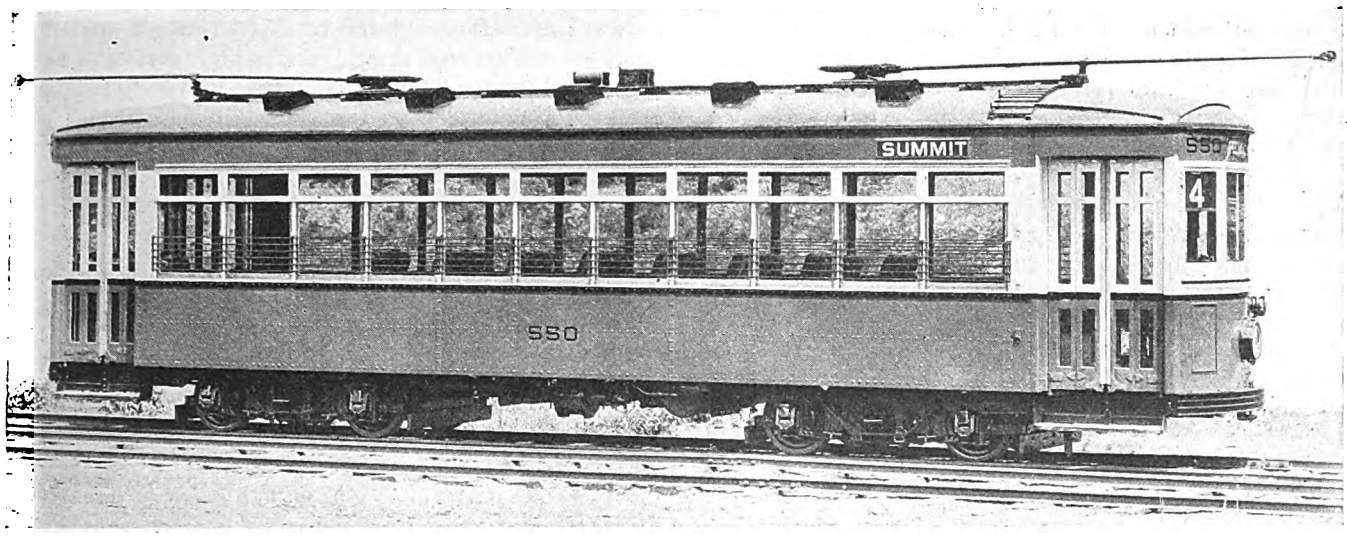


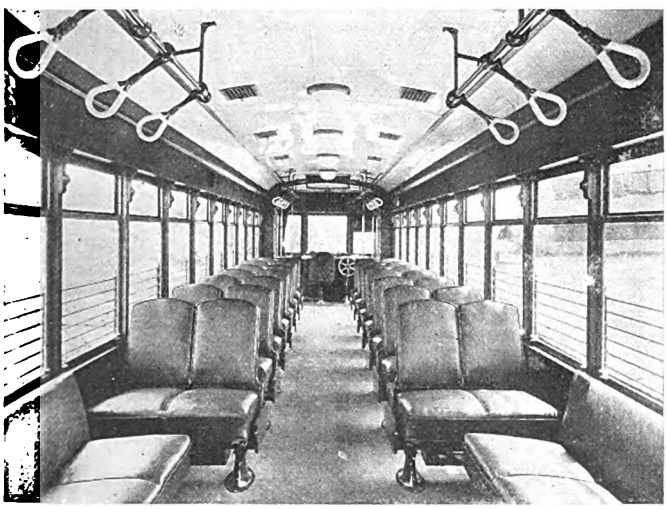
Exterior view of new light-weight city-type cars which were placed in service by Worcester, Mass., Railway Aug. 9. These are almost identical with the Springfield cars

Springfield and Worcester Companies

Introduce Latest Light-Weight City-Type Car

MARKED by special ceremonies in which civic and business organizations participated, an official demonstration trip was made in Springfield, Mass., Sept. 16, on two of the new one-man, two-man, double-end, light-weight, double-truck city-type cars which were part of the order of 50 cars placed by the Springfield Street Railway with the Wason Manufacturing Company last spring, as announced in the JOURNAL for March 26. A similar demonstration for the first of the 50 units ordered at the same time for service on the Worcester Consolidated Street Railway, at Worcester, Mass., was made on Aug. 9. As previously noted in the JOURNAL, the Osgood-Bradley Car Company furnished these units.

In Springfield C. V. Wood, president; W. L. Harwood, engineer of power and equipment; H. M. Flanders, general manager, and other officers of the company had as their guests the Mayor of Springfield and other city authorities, presidents of business clubs and representatives of business organizations. They boarded the cars at the starting point, Vernon and Broadway, shortly after 10 a.m. A trip was made on some of the railway lines, including a portion of the system where an extensive piece of track reconstruction work rapidly nearing com-



Spacious interior of the Worcester cars which reveals some of the passenger comforts

Interior view of one of the Springfield units, showing roomy and attractive features

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pletion. President Wood and some of the members of the party made a brief inspection of the work. From this point the cars returned to the center of the city, where the picture reproduced in this article was taken. The trip occupied approximately an hour and a half. There was every indication of the enjoyment and appreciation of the party of this progressive addition to Springfield transportation facilities. An hour after the trip one of the new cars was in operation on one of the principal streets in Springfield.

Twelve of the new cars had been delivered by Sept. 16. It is understood eighteen will have been turned over by the car builders by the end of last week and that the rate of delivery will be five a week until completion of the order. The car company is up to its schedule on delivery.

Worcester Also Staged Celebration

Prior to putting the first cars into service in Worcester the company took 30 invited guests, representing heads of city departments, the Mayor and Councilmen and business men of the city, for an hour's ride over the several routes. After the trip every one was enthusiastic and commented favorably on the riding qualities of the new car and the attention that the company and car builders had given to the minute details to make the units indicative of the attitude hoped for from the riding public. It is hoped that before the early part of October the entire order of 50 will have been completed. This, together with plans for rehabilitation of 100 of the latest type cars of the present fleet, will give Worcester nearly enough cars in good up-to-date condition to fill all wants, including rush-hour needs.

With the exception of certain details of equipment, which may be seen from the accompanying specification, the units for Worcester and Springfield are alike. The outward appearance of the cars is strikingly attractive. They are constructed along graceful and serviceable lines, and afford the public high visibility, a decidedly favorable feature brought out by the color scheme. Truck and platform supports are black, the body is light yellow, the belt rail red. Above the belt and body posts is cream, over windows and vestibule light yellow, and the roof is red. The cars are of the low-level type, easy to board, and have rear treadle-door exits. They have commodious aisles and comfortable upholstered leather seats.

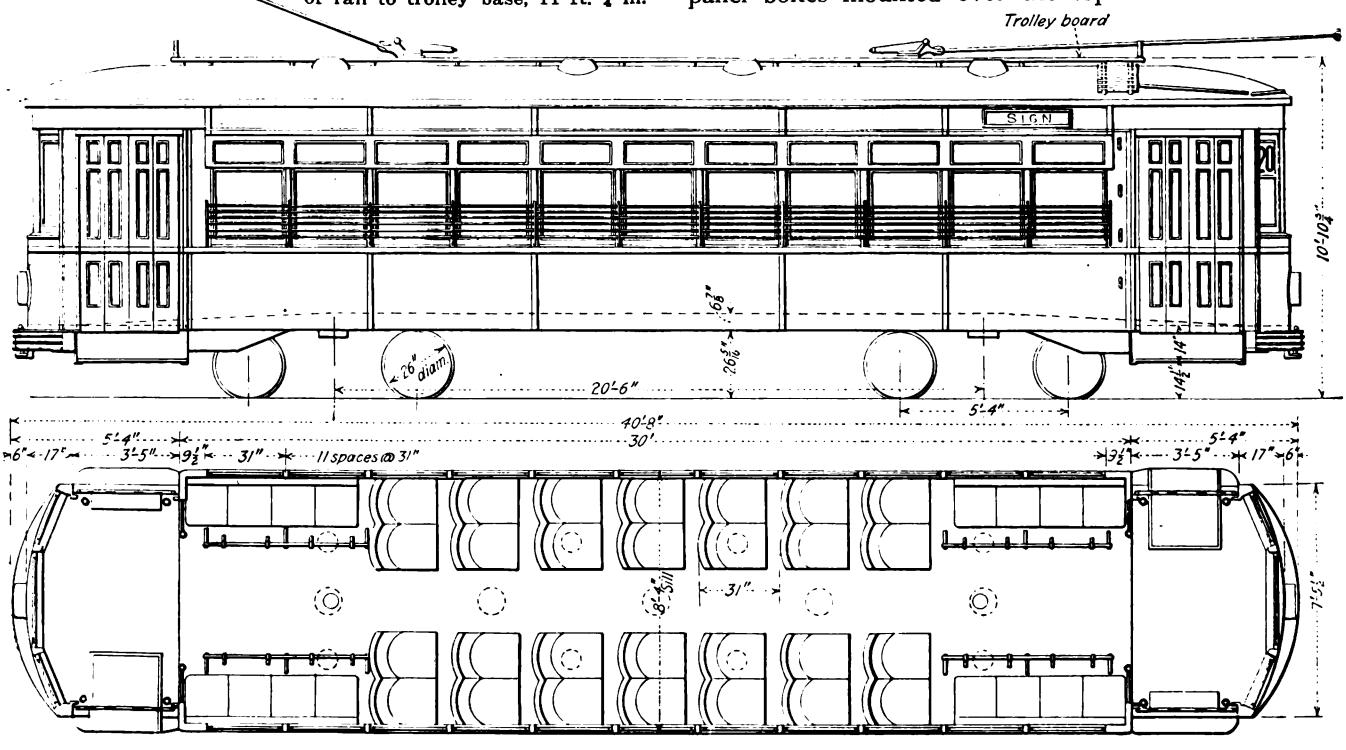
At first glance of the interior, from the standpoint of the public, an impression is given of roominess, abundant light, both artificial and daylight, and good ventilating equipment. There are four Druid glass 94-watt dome lights placed along the center line of the arch roof. Metal sash windows that can be raised so as not to obstruct the passenger's vision are one of the notable features. Ventilators are arranged on each side of the center of the roof, and the flooring is of linoleum. The units have 44 seats each, including sixteen longitudinal, four on each side at the front and back of the car. The motorman's seat in the rear can be reversed to give an additional place for a patron in the rush hour. The electric heaters under car seats are thermostatically controlled, and the interior trim of the units is African mahogany. There are no handles on seat backs, nor are there curtains on the car body windows. Rico retrieving hand straps are installed over the longitudinal seats at the ends of the car for standees. All piping for door engines and switch boxes is concealed.

New Features in Door Control

Both units are equipped with treadle control doors and stationary steps; windows in front of the motorman are arranged to open out, and the top of the equipment cabinet on the motorman's platform is of aluminum. The four doors are of the two-panel folding type. Those at the right-hand front and left-hand rear corners are pneumatically controlled by engineer's valves operating light-weight door engines. Door engines are in flush-type panel boxes mounted over the top of the door. The

Seating plan and general dimensions of the Springfield, Mass., fifty units

The 50 units for Worcester are similar with the exception of a few major differences, among which are truck wheelbase, 5 ft. 6 in.; width over all, 8 ft. 5½ in.; height of rail to trolley base, 11 ft. 2 in.



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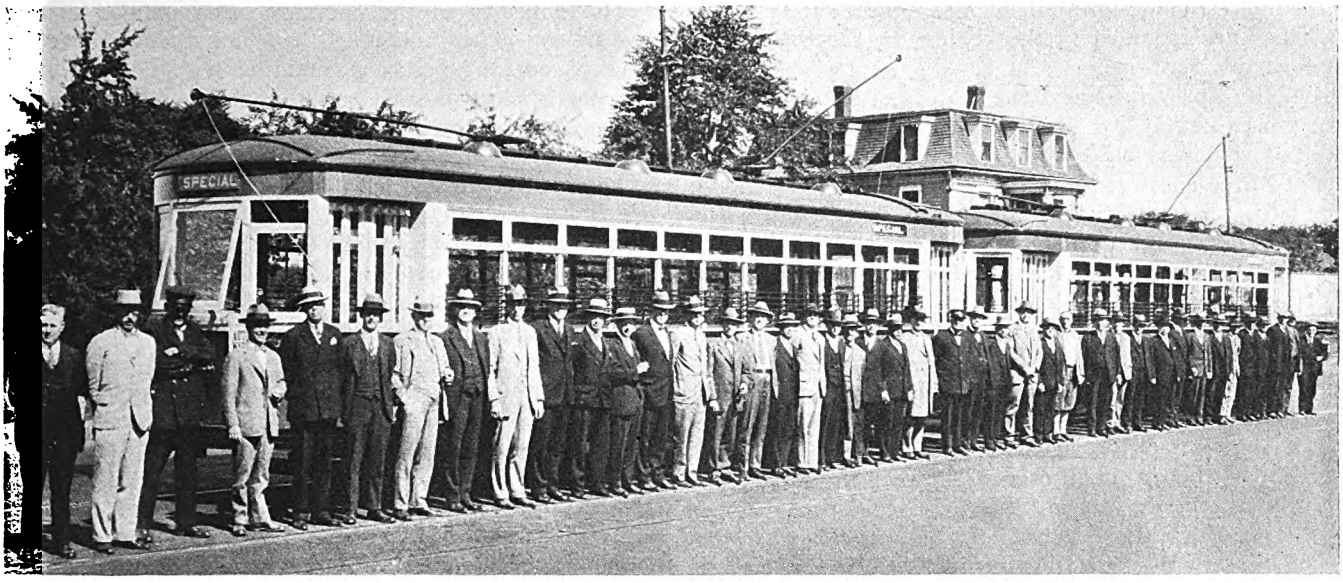

Official party on Springfield demonstration trip with two of the new light-weight city-type cars in the background. These cars are part of a 50-car order placed with the Wason Manufacturing Company

other two doors, although under the direct supervision of the motorman, are treadle-operated by means of an electro-pneumatic controlling and interlocking arrangement. In operation it is as follows: When used as a one-man car the right-hand rear door is hooked up so it can be treadle-operated after the brakes have been applied and the car operator has pressed the button on the top of the equipment cabinet. This is a new and unique feature of the treadle-operated doors. Pressing the button accomplishes two things—it draws the attention of the car operator to the rear door and it closes a circuit that interlocks the brakes with the rear door so that car cannot be moved until after the doors are closed. The seating of the brake interlocks in turn causes pneumatic switches to operate and to energize the treadle mechanism and hold the circuit on the brake interlock magnet. This circuit is not broken until the doors are closed, when the brakes can be released by means of the engineer's valve.

When the car becomes a two-man car, there is a separate switch or door control handle that permits the conductor to open the treadle door from the rear platform. Likewise, by the insertion of a key from the street, the door can be opened from outside and the rear entrance used for loading purposes by a street fare collector. The same thing can be done when operating pay-leave on outbound trips.

The company has issued an illustrated leaflet for distribution to the public in which the operation is described in a simple manner. The method of display followed for destination signs is worthy of mention. At the car end a side sign is cut into the letterboard over the window and the 10-in. route number sign displayed in the right-hand vestibule window presents

DETAIL SPECIFICATIONS OF THE SPRINGFIELD AND WORCESTER CARS

	Worcester	Springfield
Type of unit	One-man, two-man, city, double-end, double truck	Same
Number of seats	44	Same
Builder of car body	Osgood-Bradley Car Co.	Wason Mfg. Co.
Date of order	April, 1927	Same
Date of delivery	August, 1927	Same
Weight car body	35,300 lb.	36,000 lb.
Bolster centers	20 ft. 6 in.	Same
Length over all	40 ft. 8 in.	Same
Length over body post	30 ft.	Same
Truck wheelbase	5 ft. 6 in.	5 ft. 4 in.
Width over all	8 ft. 5 11/16 in.	8 ft. 6 in.
Height of rail to trolley base	11 ft. 2 in.	10 ft. 10 1/4 in.
Window post spacing	31 ft.	Same
Body	Semi-steel	Same
Roof	Arch	Same
Door	End	Same
Air brake	G. E.	Westinghouse full safety
Armature bearing	Plain	Plain Westinghouse
Axle	Carnegie	Std. Steel Wks. A.E.R.A.
Car signal system	Faraday	Same
Compressor	G.E.C.P. 27 B	D.E. H16 Westinghouse
Conduits	Flexible	Same
Control	G. E. K-35 KK	Westinghouse
Couplers	Metropolitan type	Same
Destination signs	Hunter Keystone	Same
Door mechanism	National Pneumatic	Same
Doors	Folding	Same
Energy saving devices	Arthur power saving recorder	Same
Fare boxes	Johnson Type JT	Cleveland Lock Corp.
Floor covering	Linoleum	Same
Gears and pinions	G. E. Grade M heat-treated	Nuttall
Glass	1/4 Crystal	U. S. Gov. spec. 123
Hand brakes	Peacock staffless	Same
Hand strap	Rico No. 12	Same
Heater	Consolidated Car Heater	Railway Utility Co.
Headlights	Crouse-Hinds Type 5 D.F.	C. H. Ohio Brass
Headlining	Never split	Same
Interior trim	African mahogany	Same
Journal bearing	Plain	Same
Journal boxes	Symington	Brill
Lamp fixtures	Elec. Serv. Sup. No. 23409	Same
Motors	4 G. E. No. 265 inside hung	4 Westinghouse inside hung
Painting scheme	Yellow cream, red band	Same
Register	International	None
Roof material	Wood and canvas	Same
Safety car devices	Safety Car Devices Co.	Same
Sash fixtures	Rex Curtain Supply Co.	Same
Seats	Hale-Kilburn No. 392A	Brill
Seat spacing	31 in.	Same
Seating material	Brown leather	Same
Slack adjusters	American Brake Co., Type J	Westinghouse piston traveler
Steps	Stationary	Same
Step treads	Kass	Same
Trolley catchers	Ohio Brass	Same
Trolley base	U. S. No. 20 Nuttall	Nuttall Roller Bearing No. 20
Trolley wheels	U. S.	Nuttall Westinghouse
Trucks	Osgood-Bradley, Type O.B. C 45-66-J	Brill
Ventilators	Osgood-Bradley Car Co. exhaust	Brill
Wheel type	Standard Steel Works 26-in.	Same
Wheel guards	Wood	Same
Special devices	Variable hand brake device, Folberth windshield wipers, door treadles	Door treadles

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some interesting design refinements. Kranz safety device switches are included in the cabinet in the top of the motorman's platform.

On the Springfield cars the main motor resistance in the power circuit for operating the motors is the new type of ribbon wound on edge, cutting down the weight about three-quarters and space for locating it about one-half. Safety switches for the auxiliary control circuits, as lighting, heating, compressor control and buzzer circuits, have been installed, and are an innovation in Springfield cars. It is believed this is the first time a switch of this type has ever been put on any street car. It was made especially for these cars and is a development of a switch used on the experimental car that was conceived by President Wood and designed by W. L. Harwood, as stated in the JOURNAL of March 26.

Some of the major differences between the Springfield and the Worcester cars are that the former are equipped with Westinghouse motors, control, and air brakes, whereas the Worcester units have General Electric; trucks for Springfield are Brill and for Worcester Osgood-Bradley. For the purpose of comparison and to show the difference between the two units, the specifications released by the Osgood-Bradley company and the Wason company respectively are tabulated herewith.

The Readers' Forum

Experience with One-Man Cars Satisfactory

GENERAL ENGINEERING & MANAGEMENT CORPORATION

NEW YORK CITY, Sept. 22, 1927.

To the Editor:

We note on page 445 of your Sept. 10 issue an article reciting the objections that the Los Angeles Railway has to operating its system with one-man cars. This article is of particular interest to us in view of a story sent you recently reciting the experience of the Scranton Railway.

The interest charges mentioned in the Los Angeles story probably include interest on the conversion of the entire equipment, plus charges for installation of signals, etc., and is considered reasonable.

However, several points mentioned in objection to the proposed operation are of interest to the entire street railway industry, as they may, if not rebutted, work a hardship on many companies who may be confronted with them by commissions or governing bodies before which they appear in an effort to reduce their operating expenses by one-man operation.

It is not our intention to criticise any street railway company, as we know there are often peculiarities of operation of which the outsider has no knowledge, but we wish to go on record from our experience, as follows:

Cost of breaking in men has been negligible with us. We have usually figured an average of five days.

If only 5 per cent of the present force cannot qualify as one-man operators it still leaves a tremendous balance in favor of one-man operation.

The additional supervisory force may be needed in a large railway, but this has not been the case in any of the companies under our management.

The difficulty of the operator being obliged to stop and pull switches and plug them and then remove the plugs is not an operating condition with which we are familiar. Electric switches at important points relieve the operator of such an adventure, and in outlying sections spring switches can usually be relied upon.

The additional hazard at railroad crossings is one which we emphatically deny. The hazard is not so great as that encountered by the operator of a bus.

The delays in case of accidents are present owing to time lost getting names of witnesses, but blockades can be more expeditiously handled with one man in control.

The increased possibility of hold-ups may be serious in some sections of the country, but the probability of a hold-up man assaulting a conductor has not been one of our major problems.

The city ordinances in regard to fenders is probably a serious handicap. We have found, however, that most city officials are glad to co-operate with us and permit the use of an improved type of life guard, and about 450 railway companies are now using them.

The speed of operation, in our experience, has not been influenced by the number of men on the car. Traffic conditions have everywhere affected speeds where cars must travel through the heavily congested parts of a town, and there often is a decrease in speed when the one-man car is in no wise to blame. The Wisconsin Railroad Commission, after extended observation in the Milwaukee Electric Railway & Light Company case, states:

> We are convinced that the difference in actual running time between one-man cars and two-man cars is negligible and that the substitution of one-man cars for two-man cars will have no appreciable effect upon street traffic.
>
> We are satisfied that the one-man cars can be operated as safely as two-man cars. We have discussed this feature many times in other decisions and will not enlarge upon it here.

Similar decisions have been rendered by various other commissions.

C. G. KEEN,
Railway Engineer.

A Correction on Paris Wages

CORRECTION should be made in the table of wages paid motormen and conductors on the Paris Surface Lines, as published on page 354 of the issue of this paper for Aug. 27. The correct figures follow:

Period	Monthly Wages in Francs	American Equivalent Monthly	American Equivalent Yearly
First year	757	$30.28	$363.36
Next 1½ years	787	31.48	377.76
Next three years	807	32.28	387.36
Next three years	827	33.08	396.96
Next three years	857	34.28	411.36
Next three years	887	35.48	425.76

Note—Basis of exchange 1 franc = 4 cents.

Indiana Freight Business Expanding

THAT freight service on electric lines in Indiana is increasing is shown in the business being done by the Indiana Service Corporation at Fort Wayne. The depot is handling nearly 15,000 shipments a month. One month recently 997 cars were handled, 202 of which were through-bound cars. This depot is operated 24 hours a day except Sunday, with 32 men employed. The new station is located on High Street and was constructed at an approximate cost of $400,000.

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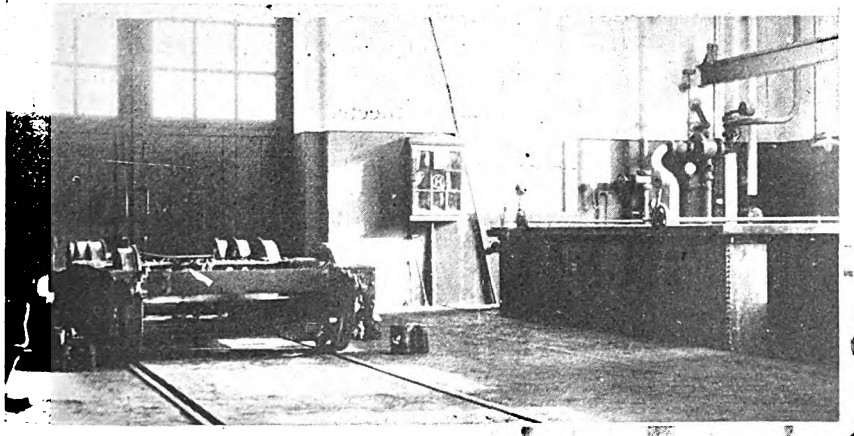
Maintenance Methods *and* Devices

Protecting Field Coil Leads from Iron Dust

CONSIDERABLE trouble was experienced at one time with short circuits in the field coils of the ventilated motors on some of the lines of the London Underground Electric Railway. The trouble occurred because iron dust from the brake shoes, rails and wheels would be drawn into the motors by the ventilating fans and would collect on the coils, where it was naturally very destructive to their insulation, particularly of the leads. Shellac was tried to overcome the difficulty, but did not prove very satisfactory as it would crack and flake, then the dust would get in. Short circuits of the kind described did not occur on the lines operating in the open or with the non-ventilated motors in tunnel service, but with the subway ventilated motors it presented a real problem.



Some of these pickling tanks are large enough to accommodate a complete side frame

Finally, the method was devised of protecting the exposed parts, like the field leads, with a paste made up of two parts of asbestos powder and one part of mica powder, which are mixed to the consistency of a paste by the use of gray enamel Megalac. This enamel is the material used in the Underground shops for coating the armatures. The paste is mixed with these three ingredients until it has about the consistency and appearance of putty. It is then held in by Empire cloth. Then tape is wound around the joint. This practice is not necessary with unventilated motors, where Empire cloth alone is enough protection.

The advantage of this insulating paste or putty is that it can go into service in a plastic condition.

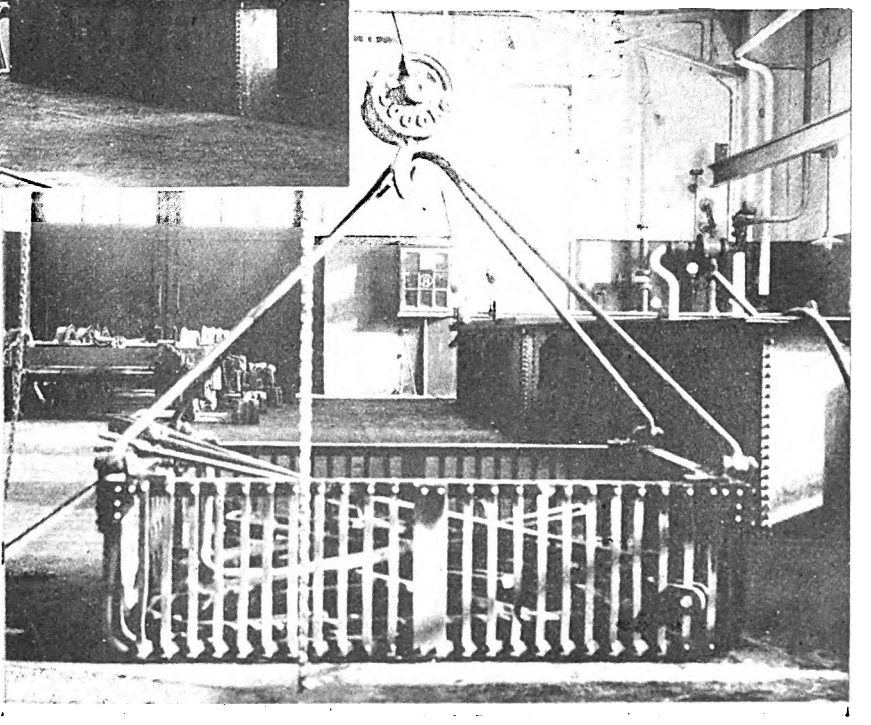
Cleansing Is Thorough in European Repair Shops

VERY thorough cleansing which truck and other parts receive when a car goes through overhauling at one of the repair shops is a feature of the repair shop practice of most of the European electric railways. It is not uncommon in this cleaning process to let these parts "pickle" in vats of soda or other chemical solutions or to be steamed to remove all paint, grease and other dirt before the car is put into service again.

Two of the accompanying illustrations show the tanks used for this purpose in the shops of the Hamburg Elevated Railway, Hamburg, Germany. The illustration at the left shows one of these tanks and the end of another. Each tank is large enough to take in an entire truck frame. These tanks are filled with a solution, kept warm by means of steam pipes, of which soda is the principal ingredient. In the lower part of this tank is a grating on which the truck frame rests, while the cleaning process is going on. This grating is given a rocking motion to agitate the liquid and so free the truck from grease and dirt more easily. The truck frames are left in this tank for a sufficient length of time so that they come out quite clean.

Small parts are put in the metal basket shown in the second illustration and are cleansed in the same way. Similar practice is followed in Berlin and other cities, and various cleansing fluids for this purpose are sold by dealers in chemicals. In Dortmund, Germany, where such a chemical cleaning tank is used, a pipe connection has been fitted near the bottom of the tank by which compressed air can be admitted to agitate the liquid.

In the repair shops of the London General Omnibus Company, prefer-



All metal parts of trucks receive a soda bath during overhauling at Hamburg

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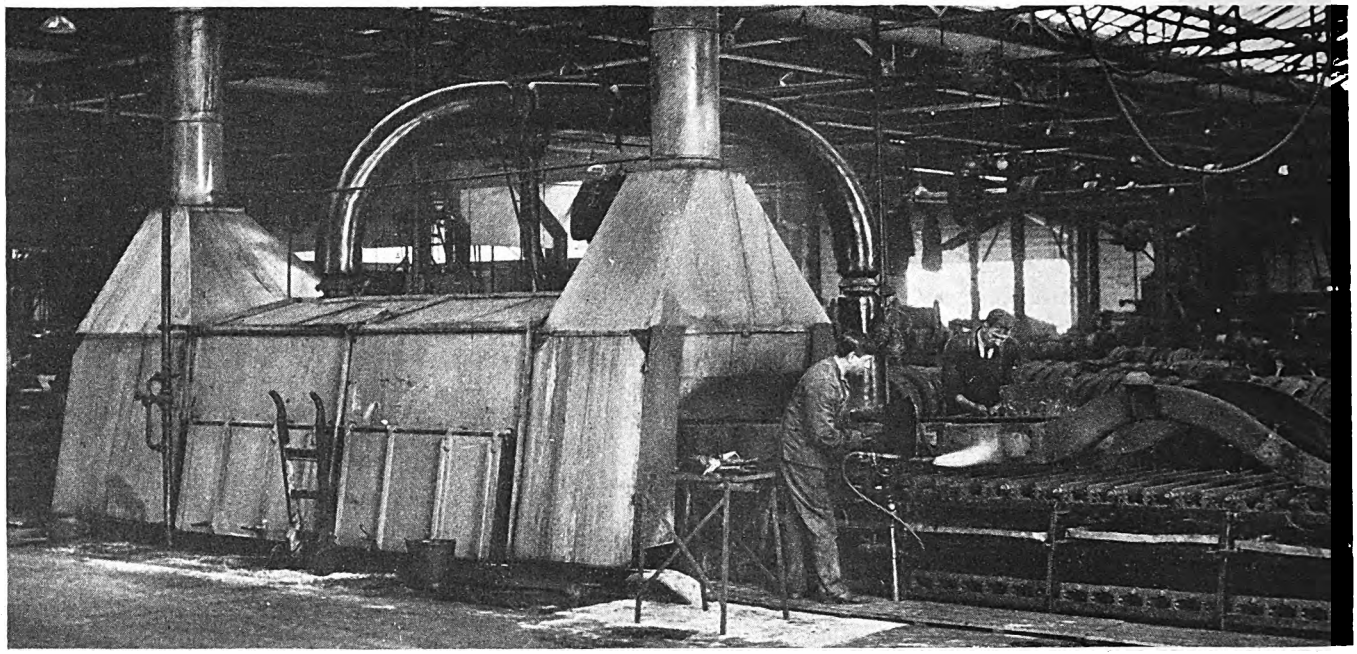


In London steaming is used for cleaning many of the large car and bus parts in the overhaul shop

ence is given to steaming. The third illustration shows the system used. The steam chamber shown is large enough to hold a pair of bus side frames. In this particular view a workman is welding the side frame before it enters its Turkish bath. Incidentally this process, like most others in the Chiswick repair shops of the London General Omnibus Company, is carried out on a moving belt conveyor. The motion is a continuous though a slow motion, and while the part, in this instance a bus frame, is on this conveyor the various necessary repairs are made by the workmen, who remain in the same place. The welding and steaming, shown in this particular illustration, are but two of the processes which this bus frame undergoes while it is on this moving platform.

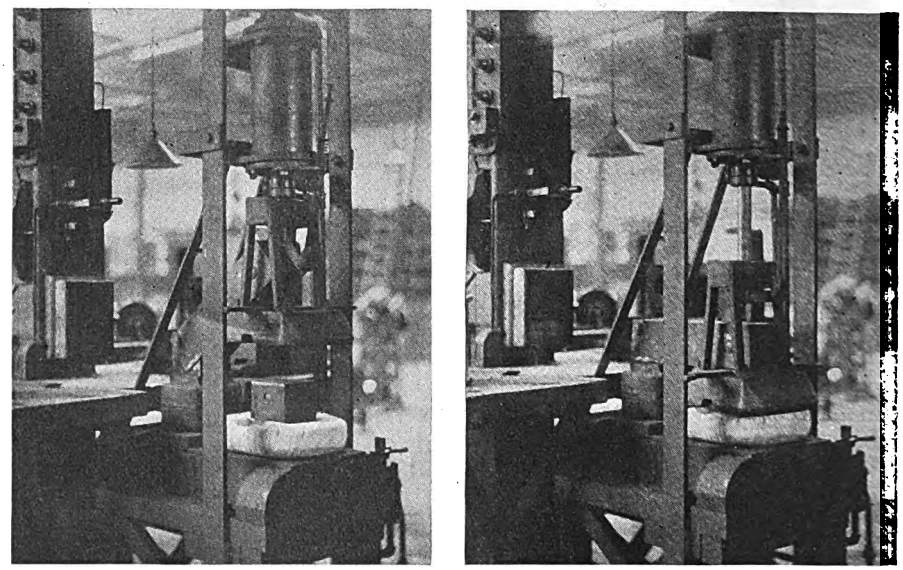
A bolt in the axle caps of the motor is worth two in the bushes along the roadbed.

Field Coils Tested Under Pressure

USE is made in the shops of the Portland Electric Power Company of an apparatus to test field coils for short and open circuits while they are subjected to a pressure similar to that which exists when the coil is bolted in position in the shell. An air cylinder and shoe compress the field coil while it is being subjected to the customary alternating current electrical test in an open transformer. The simplicity with which the apparatus operates is the outstanding feature.

The frame which carries the air cylinder is built up from the ground and supports, in addition to the air cylinder, the base and laminated section of the transformer. The top of the transformer core is hinged so that it may be raised by air pressure to permit the coil under test being slipped over the vertical leg. Also, connected to the piston of the cylinder is the ram, cut away to slip over the core of the transformer and exert pressure on the coil that is under test.

In operation, the coil is slipped over the exposed leg of the transformer core. Then air is admitted to the cylinder, lowering the head to the coil and at the same time bringing the top portion of the core in contact with the leg. This closes the magnetic circuit. With the coil under a pressure of approximately 2,000 lb., the primary coil of the transformer is connected to the a.c. circuit. The current is indicated on an ammeter. Shorts or open circuits in the coil under test result in abnormal or subnormal rating on the ammeter.



Testing field coils under pressure in Portland, Ore.

Apparatus used in Portland, Ore., to test field coils under service conditions. The air cylinder applies a pressure of approximately 2,000 lb. to the coil while it is in the magnetic field of an alternating current transformer. Variation in the current flowing through the primary coil of the transformer indicates shorts or open circuit in the coil under test. At left, open position. At right, closed position.

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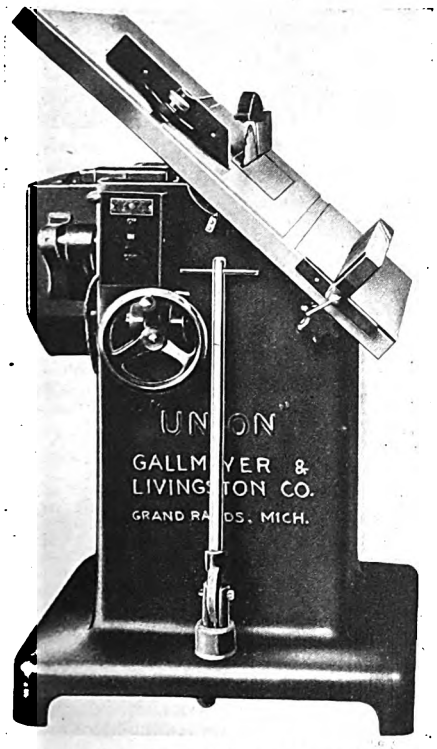
New Equipment Available

Electrically Driven Arbor Saw

GEARS and belts are eliminated in a new type direct-driven arbor saw placed on the market by the Gallmeyer & Livingstone Company, Grand Rapids, Mich. The machine has a 30-in.x3-in. table, machined and fitted with a removable throat plate to allow for the use of a dado head, grooving saws, etc. The table tilts up to 45 deg. and may be locked at any desired setting.

A dial with graduations and a pointer indicates the position of the table. A stop facilitates a quick and accurate return to the horizontal position. A cross-cut gage can be used on either side of the saw, two slots in



Portable direct-driven arbor saw

the table being arranged for this purpose. The gage can be set at any angle and clamped rigidly. Holes are provided for mounting an auxiliary wood face piece when such action is desirable.

The ripping gage is machined on both sides and can also be used on either side of the saw. Tightening of the lever head screw locks the ripping gage in position and lines it up automatically with the saw. A guard to protect the operator is placed over the saw and can be set for any thickness of stock. A splitter guard also keeps the stock from pinching the saw. The saw may be raised and lowered from flush with the table to high enough to cut 2½-in. stock.

The pedestal is a heavy one-piece casting fitted with two rollers at the back and two stationary feet at the front to give a firm foundation when in operation. When the handle is pulled forward in a position for moving the machine a cam lifts the feet from the floor automatically and brings the weight of the front of the machine on to a third roller, which is carried on a swivel bearing moving with the handle. This makes the machine portable.

Correct pressure on a brush holder spring hammer will avoid many a flashy and costly repair.

Extension for Spray Painting

FOR painting cars, ceilings and high, inaccessible places an extension for a spray painting gun has been developed by the Alexander Milburn Company, Baltimore, Md. It grips the standard Milburn gun, which while in use can be swiveled to any desired angle. The section is 8 ft. long and with the operator's reach will spray the paint to an approximate height of 14 ft. Other lengths of extensions will be furnished if desired.

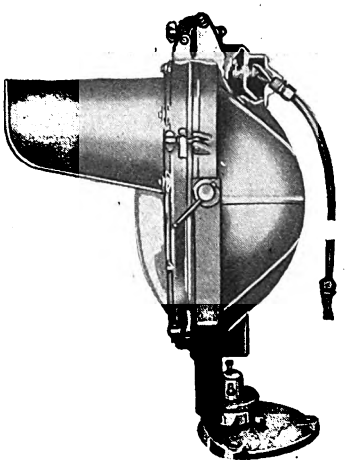
For painting within arms' length the gun is immediately detachable and can be used. A slight pull on the operating handle of the extension operates both the air and the levers on the spray gun simultaneously. The paint under pressure flows to the atomizing chamber, is expanded and driven into the pores of the surface to be covered.

Extension arm applied to paint spraying gun

The extension unit consists of the extension and standard type gun, pressure feed tank with the regulators, etc., 25 ft. of air hose, 25 ft. of paint hose and hose with connections to the compressor or pressure container. The extension is constructed ruggedly of strong tubing and has the gun and angle control close to the bottom for easy manipulation. It is light in weight, well balanced and can be handled easily.

Increased Efficiency in Floodlight Projector

BY IMPROVED design greater efficiency is obtained in a parabolic shaped reflector of 24 in. diameter just announced by the Crouse-Hines Company, Syracuse, N. Y. The reflector intercepts and redirects into the beam a greater portion of the lamp rays than has here-



Type LCE-24 floodlight projector with hood recommended for railway yard lighting

tofore been obtained. The case is made of special cast aluminum alloy to resist corrosive gases. It is practically airtight, the large radiating surface making the usual ventilators unnecessary. This feature prevents dust and dirt from getting into the case and collecting on the reflector. The door and the case are ground to fit so that no gasket is necessary.

By means of two simple adjustable stops the projecting case can be released from its position, tipped completely over or turned around for cleaning and lamp renewal and then returned to its original position. This makes it unnecessary to refocus the projector every time a lamp is renewed or the lens cleaned. This is especially convenient when the projectors are mounted on the edge of a tower, ledge or roof.

When used for railway yard lighting, the floodlight projector can be supplied with a 15-in. hood to throw the stray light beneath the tower. This also prevents soot from falling on the lens.

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News of the Industry

Union Men Advertise Service at Their Own Expense

An appeal from the trainmen of the Tide Water Power Company at Wilmington, N. C., addressed to the general public in behalf of their employer's business, appeared recently in the Wilmington *Star* in the form of a large advertisement which accentuates the peaceful revolution taking place in the relation of employer and employee in the industry. The advertisement was written and paid for by the members of the Amalgamated Association, and occupied a space three columns wide by eight inches deep. It was as follows:

REQUEST

An Appeal from the City Lodge No. 708

The Members of the Amalgamated Association of Street and Electric Railway Employees of America, Division No. 708, of Wilmington, N. C., employed on the city and suburban cars of the Tide Water Power Company, is paying out to its employees in Wilmington

Every month more than $36,000. Every twelve months more than $432,000.

This money is largely spent in Wilmington as a big factor in keeping Wilmington going.

OUR APPEAL

Is to ride the cars which we are operating so as to enable the company to maintain schedules and operate more cars, thereby giving more men work and making a larger payroll for Wilmington.

We, the members of the Amalgamated Association, earnestly solicit your patronage as passengers on the cars which we operate and shipment of freight and express over our line. We are endeavoring to carry you safely and on schedule to and from your work or to your destination. We have an interest in our work and in serving you and we trust that you will help us and help Wilmington by riding the cars which we operate. This will increase the number of employees, therefore making the payroll in Wilmington larger by patronizing the transportation system of the Tide Water Power Company.

This advertisement is written and paid for by the members of the Amalgamated Association of Street and Electric Railway Employees of America, Division No. 708.

Safety-Conscious School Children in Atlanta

At the request of the superintendent of the Atlanta, Ga., public schools, the Georgia Power Company will this year detail several men to visit every school in the city and tell the children about safety methods.

Last year an official of the company conceived the idea of reducing accidents, particularly among children, by having two trainmen visit the different city schools and talk for a few minutes on safety. After a considerable argument the Board of Education was finally sold on the proposition and two trainmen, themselves the fathers of several children, were taken from their cars and detailed to the work of talking to the children in the city schools.

The two men visited the different schools and were given a few minutes at chapel exercises. So good an impression did these men make and so important did the school board consider the work that the superintendent wrote President Arkwright asking that he detail speakers to talk to the children every year.

In addition to lowering the number of accidents to children, which was the main object of the speaking campaign, the plan accomplished other and scarcely less important things. It showed the children and their parents that the street car company was something more than a "soul-less corporation" as had been pictured. It demonstrated that the company really had the safety of the children at heart. It got the attention of the children themselves and built up a kindly feeling for the company. And it taught them valuable safety habits for every-day use in riding on the street cars and crossing the streets of the city.

Officials of the company consider the expense of taking the speakers from the cars and filling their places with substitutes negligible compared with the splendid results obtained.

Recapture Advocated in New York City

Unification of transit lines with non-political control advocated by special counsel for Transit Commission—Cost put at $196,000,000—Surface lines ignored—Not all rapid transit lines involved

SAMUEL UNTERMYER, special counsel for the Transit Commission in its investigation of the New York transit situation, has rendered a report to that body in which a summary of the recent hearings is given and recommendations are made for a plan of transit unification. Many interesting exhibits are included to support the text and recommendations. The summary was made public on Sept. 26. It is not expected that the plan in detail, a book of several hundred pages, will be ready for distribution for another week or ten days.

Mr. Untermyer recommends the recapture of the lines of the New York Rapid Transit Company, subsidiary of the Brooklyn-Manhattan Transit Corporation, and the termination of the lease under Contract 4 between the city and the New York Rapid Transit Company on Dec. 31, 1928, and that notice should be served on the company by the city to that effect.

A similar notice of recapture and the termination of the lease between the Interborough Rapid Transit Company and the city and the termination of Contract 3 between that company and the city is recommended. But simultaneously with such notice to the Interborough Rapid Transit it is recommended that an offer be made to buy the Interborough Rapid Transit and its leased Manhattan Elevated property by the exchange of New York City bonds, aggregating $245,594,000, for the securities of the companies. The exchange of securities recommended is on the following basis:

$148,762,000	3½ per cent city bonds for I.R.T. outstanding 5 per cent mortgage bonds.
33,832,000	3½ per cent city bonds for I.R.T. outstanding 7 per cent notes.
10,500,000	3 per cent bonds for I.R.T. outstanding 6 per cent notes.
10,500,000	3½ per cent city bonds for I.R.T. stock at $30 a share (350,000).
42,000,000	3 per cent city bonds for Manhattan Railway Company's stock at $70 a share (600,000).

The city bonds would have a sinking fund attached which would retire them at maturity. In event such an exchange of securities materializes, it is recommended that at least that portion of the city bonds exchanged for company bonds and notes be exempted from the debt limit by securing an order of the Appellate Division of the Supreme Court of New York.

Legislation should be sought, according to Mr. Untermyer, granting to the commission and the city the right through the courts to condemn by the power of eminent domain such company property as may be required by the city to carry out a unification plan. Presumably this power might be used in connection with condemning the Sea Beach and Brighton lines of the Brooklyn-Manhattan Transit in case the city could not secure trackage rights over those lines.

In event the New York Rapid Transit Company does not notify the city 30

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days after notice of recapture that it is willing to accept the terms of such recapture, it is recommended that the city begin a suit for a declaratory judgment to determine the right of the city to terminate Contract 4 and the amount payable by it to the company.

If the Interborough Rapid Transit does not accept the offer of purchase made by the city within two months after it has been authorized by the city, the latter should then continue its proceedings for the recapture of the recapturable portions of that property.

Board of Transit Control

Formation of a corporation with authority to lease from the city such transit lines as it may own or acquire is recommended. The corporation would have a nominal share capital, if any, and the right to issue bonds and other obligations. The board of directors would consist of nine members. The chairman of the Board of Transportation would be chairman of the board and a director. The comptroller of New York City would be a director and a third would be named by the mayor. The Real Estate Board of New York, Merchants Association of New York, Brooklyn Chamber of Commerce, Queensboro Chamber of Commerce and the Bronx Board of Trade and Bronx Chamber of Commerce, acting together, would each submit a nominee to the Transit Commission, which would in turn name such nominees as directors. The Borough of Richmond will have a representative on the board when the subways are extended there. The terms of directors will be from four to six years. Eight directors selected as above shall elect the ninth member. The mayor will be an ex officio member of the board without voting power. The ninth director elected as above described will be president of the corporation and must be an operating man of not less than ten years' experience. Directors will serve without compensation, excepting that $450 will be apportioned among them at each meeting of the board to the exclusion of the chairman, president and comptroller. Salaried officials will include the president, one or more vice-presidents and other minor officials.

This plan of control does not look toward municipal operation, says Mr. Untermyer. He recommends that the lease from the city of its constructed or acquired subways to the new corporation be for 25 years and that such subways be operated on a 5-cent fare "until and unless otherwise required by law."

Referendum Proposed

Mr. Untermyer suggests that the following proposal be submitted to a referendum vote:

> Do you favor the repeal of the existing law so as to assure the continued maintenance of a 5-cent fare on the city-owned and operated transit lines as between the car riders, the taxpayers and the owners of the properties benefited, after all private interests in the properties have been eliminated, if it should hereafter appear that the maintenance of such fare yields and may continue to yield less than the cost of service, and that it will or may involve annual deficits that must be met by taxation.

The law referred to in the above-proposed referendum is that of 1924, which requires that the fare be readjusted upward if during the third year of municipal operation of a road the gross revenues are not sufficient to cover operating expenses, fixed charges and amortization costs.

Mr. Untermyer's report contains various exhibits tending to show that the new city system now being constructed when joined with the recapturable portions of the existing privately operated properties will make a self-supporting system on a 5-cent fare within a comparatively short time. He says:

> If the new city subways are compelled to increase the fare to, say, 7 cents, will the existing rapid transit lines be likewise permitted to increase their fare and thus penalize 79 per cent of the car riders and incidentally add the huge sum of $44,000,000 a year to the revenues of the present privately owned companies? If not, how can the new city subways hope to get their share of the traffic or to relieve the existing congestion? . . . I do not for a moment admit that the new city subways when joined with the recapturable properties will not make a self-supporting system on a 5-cent fare within a comparatively few years. The proofs are to the contrary.

Surface Lines Would Not Be Included

Mr. Untermyer would exclude surface lines from the proposed unification of rapid transit lines because, among other reasons, they are losing money and "it would involve the impossible task of separate negotiations with each of the 43 companies included in the seventeen separate operating systems."

Representatives of the Brooklyn-Manhattan Transit Corporation are expected to contend in court that the city cannot recapture until ten years after the completion of the Nassau Street subway, construction of which has not yet been started, on the ground that its contract with the city gives it trackage rights which the city cannot furnish until the Nassau Street subway is built.

The B.-M. T. also will oppose condemnation of its Sea Beach and Brighton elevated lines, on the ground that such condemnation would be unconstitutional. It also will oppose legislation for condemnation, which Mr Untermyer has suggested.

The officials of the company also intend to appeal to popular sentiment, particularly in Brooklyn, against recapture of the B.-M. T. subway system, which they assert would result in a disruption of the present Brooklyn rapid transit service and leave many sections without transportation to midtown or uptown Manhattan without payment of an additional fare. Another argument which spokesmen of the B.-M. T. intend to use in an appeal for popular support against the plan is that the city cannot find the $196,600,000 needed for the recapture plan.

James L. Quackenbush, general counsel of the Interborough, said he did not care to discuss Mr. Untermyer's report.

John H. Delaney, chairman of the Board of Transportation, who is Mayor Walker's chief adviser on transit matters, approved the Untermyer report in principle, but said that there undoubtedly would be changes in minor details, as the plan suggested by Mr. Untermyer in his report was only tentative. In the presence of Daniel L. Ryan and Frank X. Sullivan, the other members of the board, who gave general acquiescence to his views, Mr. Delaney said:

> There are three big points about the plan. It preserves the 5-cent fare, it assures public control and it eliminates stock speculation. The entire Board of Transportation is heartily in accord with the report in principle.
>
> The city has not money enough within its debt limit right now to pay $196,000,000 for recapture, but it will take a year to work out the proposals and before they can be put into effect.
>
> If the city decides to put the money into recapture of the lines, this will affect the debt limit only temporarily. The entire investment which private capital now has in the lines which it is sought to recapture is self-supporting. The returns which the railroads are securing are sufficient to carry the investments by the companies. We would be changing the form merely and it would throw no additional burden on the city.
>
> We know that the B.-M.T. subway system is showing a profit to the company. So far as the Interborough is concerned, the earnings of its East Side and West Side subway lines are all thrown into one pot at present. If we decide to recapture the Interborough East Side subway, it would take a year to allocate the earnings of that system before we could go to the court to have the city's investment in that line exempted from the debt limit and demonstrate what its earnings were.
>
> I am pretty well satisfied with the whole idea of the plan. I suggested this idea of a quasi-public service corporation a year ago in an address before the Municipal Club of Brooklyn. It is very gratifying to find that Mr. Untermyer has found a way out and has reached a solution without municipal operation.
>
> We are not so much concerned with municipal operation as we are with getting away from private exploitation.

Chairman Recommends Careful Study of Report

Dwight W. Morrow, chairman of the committee formed to represent the bondholders at the time the financial structure of the Interborough Rapid Transit Company was readjusted, issued this statement on Sept. 28:

> An informal meeting of the committee of Interborough bondholders was held today and there was discussed the report and recommendations of Mr. Untermyer, the special counsel to the Transit Commission, on the proposed plan of readjustment. It recognized that this report is preliminary in character, but the committee is of the opinion that the plan should be given careful consideration and that everything should be done by the representatives of the bondholders to aid the Transit Commission and its counsel in its efforts to work out the complicated task imposed upon the commission by the Legislature.

Mr. Morrow's statement was issued late in the day at the offices of J. P. Morgan & Company. J. P. Morgan is

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the nominal head of the committee, but Mr. Morrow has acted as its chairman since the readjustment in the Interborough's affairs on May 1, 1922. The committee was formed to further the interests of owners of first and refunding 5 per cent bonds, of which $150,000,000 are outstanding, and of three-year secured convertible 7 per cent notes.

Meanwhile the Citizens Union has opened an attack on the proposed constitutional amendment, to be voted on in November, by which $300,000,000 of city bonds would be released from debt limit consideration and the money used for subway construction. The union utilized Mr. Untermyer's report as a basis for its attack. In part the statement read:

> The report of Mr. Samuel Untermyer to the Transit Commission throws a flood of light upon the real purpose of the constitutional amendment to increase the city's borrowing capacity, which is to be voted upon at the coming election.

The statement then quoted Mr. Untermyer's fifteenth recommendation, which was to the effect that everything possible should be done in order that public approval of the proposed amendment could be obtained.

Thrift Conspicuous in St. Louis

After the stockholders of the United Railways Savings & Loan Association, controlled by employees of the United Railways, St. Louis, Mo., had voted to increase the capital stock from $11,000,000 to $12,000,000 the board of directors declared a six months dividend of $114,000.

The association, formed twelve years ago with 126 members to encourage thrift and home owning, was authorized at the outset to issue capital stock for a gross value of $1,000,000. Today the association has 6,000 members and assets of $4,500,000. In August, 1927, the receipts of the association were $200,000 and loans $165,000.

Railway Exhibit in Rochester Includes Instructive Scenario

A film which features the New York State Railways exhibit at the annual Rochester, N. Y., Exposition shows how the present electric railway lines in the city follow the old Indian trails. This scenario was written by Leon R. Brown, editor of the *Transportation News*, house organ of the Rochester lines of the railways. The picture is part of the industrial course for public school pupils.

The railway's exhibit also graphically shows the toll in street accidents through carelessness of motorists and pedestrians by means of a film, in a trolley car, which is entitled "What the Motorman Sees." This depicts the many close calls the man at the controller experiences during the course of the day's work.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Oct. 3-7*—American Electric Railway Association, annual convention, and exhibit, Public Auditorium, Cleveland, Ohio. Exhibits open at noon of Oct. 1.**

***Oct. 4* — American Automobile Association, Motor Bus Division, Cleveland, Ohio.**

***Oct. 18-21*—National Association of Railroad and Utilities Commissioners, thirty-ninth annual meeting, Baker Hotel, Dallas, Tex.**

***Oct. 26-27*—Public Utilities Association of West Virginia, annual convention, Parkersburg, W. Va.**

***Oct. 26-27*—Society Automotive Engineers, Transportation Section meeting, Hotel Sherman, Chicago, Ill.**

Ohio Safety Councils Will Hold Monster Meeting

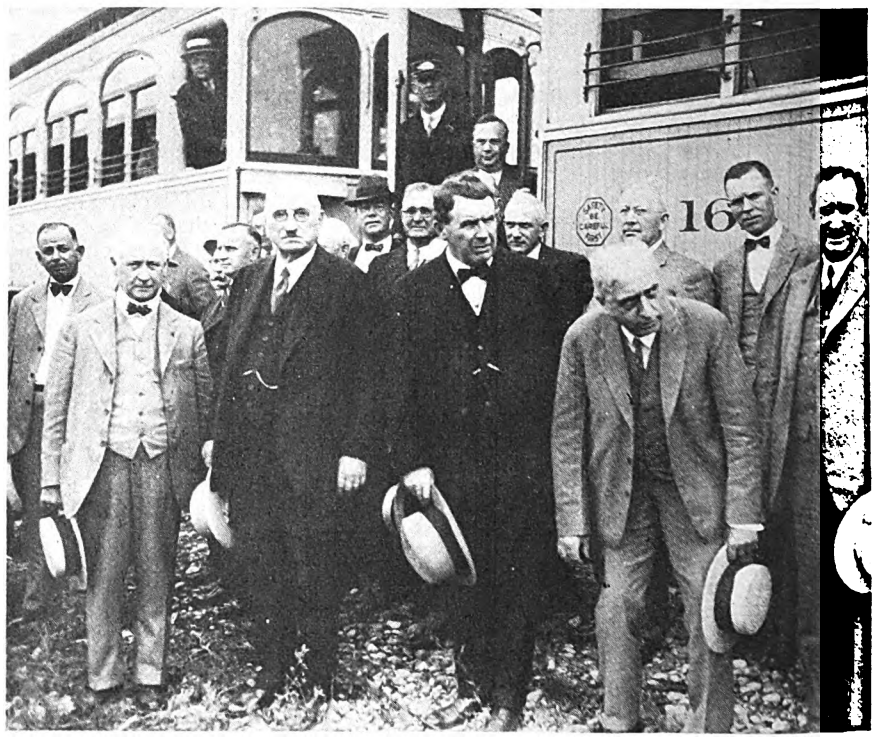
Representatives of utility companies, industrial plants and safety councils from all over Ohio will hold a two-day safety congress and exhibition in Columbus on Nov. 10 and 11.

There are about 200 plants and other companies in Ohio now doing safety work, with the result of a reduced rate to employers for claims amounting to $1,250,000. The congress and exhibition will show how this great saving was accomplished and the methods used in prevention of accidents.

Sick Employees of Pacific Electric to Have Added Comforts

The New California Lutheran Hospital of Los Angeles, Cal., is to be the official headquarters for afflicted employees of the Pacific Electric Railway. This new hospital to care for the sick and injured will have many improvements over the previous hospital facilities. Through negotiations concluded by Dr. Weber, chief surgeon of the medical department, and approved by Vice-President and General Manager Pontius, the $1,500,000 edifice will become available to all of those whose names appear on the official payrolls. It was announced that dependent family members of employees are to be granted a special rate in the two and four-bed wards at the low rate of $3.75 per day for hospitalization.

Dr. Weber's staff has been augmented in many ways so that at the present time practically every disease or injury can be cared for in an efficient and thorough manner. The scope of the medical department has been extended not only to the very numerous disorders and injuries to which human flesh is heir, but also to dental service.



Officials of New York State Railways and city of Rochester on inspection trip over new subway railroad in bed of abandoned Erie Canal. The cars were the first operated by electricity over the new line

Front row, left to right: Charles E. Ogden, secretary to the Mayor; Charles R. Barnes, City Commissioner of Railways; Mayor Martin B. O'Neil, John P. Morse, chairman of the Citizens' Committee on Subway Operation, and James F. Hamilton, president of the New York State Railways.

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New Orleans Has 100 Per Cent Safety Day

For the first time in its history the New Orleans Public Service, Inc., New Orleans, La., established a 100 per cent transportation safety record on Sept. 20. During the 24 hours ending at midnight not a single accident was reported. In that period 399 cars were operated over 38,966 miles of tracks, 22 buses over a mileage of 2,866 and approximately 395,000 passengers were carried. New Orleans has a population of 425,000.

The nearest approach to the perfect record was made on several occasions when only two accidents were reported during an entire day. The term "accident" does not necessarily mean bodily injury, but covers all forms of complaints, where a report is required to the company.

New Services Planned in Maine Sections

The York Utilities Company, Sanford, Me., operating between Biddeford and Sanford via Kennebunk, discontinued service on Sept. 15. Service in Sanford over York tracks will be confined to a 5-mile route between Sanford and Springvale. The bus line from Sanford to Biddeford via Alfred will continue to operate, and also the Sanford-Springvale bus line. The company is also seeking approval of a petition to operate buses between Biddeford and Kennebunkport. Citizens of Sanford wish to have the electric railway operate between Sanford Square and Lion Hill for the benefit of mill employees. The Biddeford & Saco Street Railway is planning to use York Utilities rails in Biddeford between City Square and Proctor Road. It is the intention of the Biddeford & Saco company to lease the route from month to month. If the line proves profitable, a long-time lease will probably be negotiated.

Safety Work Expanding in West Virginia

The Monongahela West Penn Public Service Company, Fairmount, W. Va., which is extending its safety work throughout its territory, will hereafter devote at least one page of *Courtesy and Service*, its magazine, to news of the safety and accident prevention work. President Alexander and others are giving valuable suggestions and assistance to the safety director in co-ordinating the safety program with other activities of the company. At various places on the properties, such as carhouses, garages, power plants, substations, linemen's rooms, trainmen's rooms and shops, safety suggestion boxes have been installed. With these boxes will be provided pads for safety suggestions. This is an invitation to all employees of every department to submit suggestions which, in their opinion, will make for greater safety or eliminate hazardous conditions or practices now existing. Employees are urged to submit suggestions, every one of which, according to the statement of the company, will receive attention and, if worthy, will be put into effect. If it cannot be carried out the reasons why will be given to the one making the suggestion.

Hearings Begun on North Shore Rate Increase

Hearing of evidence on the application of the Chicago, North Shore & Milwaukee Railroad to the Interstate Commerce Commission for permission to increase rates for intrastate travel in Illinois and Wisconsin on a par with its interstate rates began in Chicago Sept. 21 before Examiner Hoy. L. E. Butler, assistant to the vice-president, testified that interstate rates on the North Shore line were recently increased to 3.6 cents a mile, while intrastate fares in Illinois and Wisconsin still remained at the 3-cent level. The proposed increase in rates, he explained, would not affect commutation tickets and was made necessary by the strong competition under which the road operated with steam lines.

Baltimore Riders Read About Iron Horse

In the Sept. 22 issue of *Trolley News*, the car pamphlet of the United Railways & Electric Company, Baltimore, Md., an interesting story is told entitled "The Fair of the Iron Horse," the pageant and exhibition of the Baltimore & Ohio Railroad, in commemoration of its hundredth birthday. When spread out the folder on one side is a map showing the car and bus line connections to the Fair Grounds.

Utility Subjects to Be Discussed Before Florida Students

Lecture courses in all of Florida's higher institutions of learning will be conducted this fall by speakers to be furnished by the Florida Public Utilities Information Bureau. The lectures delivered at the University of Florida were made following special invitations sent to the experts by the executives of the school. Lectures as planned by the committee, it was stated will be of much assistance to the students.

Col. Peter O. Knight, Tampa attorney, and John P. Ingle, manager of the Jacksonville Traction Company, recently lectured at the University of Florida. Robert J. Holly of Sanford is director of the bureau, Mr. Ingle is chairman of the executive committee.

For the past several years many lectures have been delivered by public utility experts in Florida before classes at the University of Florida, at Gainesville, and with the announcement of the committee's lecturing program, invitations for the speakers are expected to come from all the state institutions.

Further Efforts to Make Safety a Reality

White lines indicating how far the rear end of a street car will swing while making a curve are being painted on all downtown street intersections in Atlanta, Ga., by the Georgia Power Company. Motorists and pedestrians who stay clear of the line are out of the danger zone. Safety experts say that the lines will prevent a number of yearly street car accidents as well as speed up the cars, often delayed by traffic in turning corners.

New Franchise for Omaha to Be Submitted

Preliminary conferences between the members of the City Council of Omaha, Neb., and representatives of the bondholders and stockholders of the Omaha & Council Bluffs Street Railway have resulted in an agreement to submit a new franchise at a special election to be held on Jan. 10, 1928. As tentatively agreed upon the franchise will have a life of 30 years; it shall not be exclusive, but will give the Council the right to license buses and other forms of city transportation; it shall be subject to the exercise by the city of all future powers conferred upon it. It provides that the right to the use of the streets shall cease whenever the franchise terminates, and that city firemen and policemen and mail carriers in uniform and on duty be carried free. A proposal to retire half the bonds in twenty years was voted down.

Freight Service in Utah Authorized

The Bamberger Electric Railroad has been authorized by the Public Utilities Commission of Utah to operate a pickup and delivery freight service in less than carload lots at its terminals, Salt Lake City and Ogden. The application was protested by the Salt Lake-Ogden Transportation Company, an auto truck line, but the commission held that there was no good reason why such permission should not be granted if shippers desired this service.

Lower Fare Sought on Atlanta Line

A petition of patrons of the Oglethorpe University car line asking for a unit fare of 7 cents between Oglethorpe and Atlanta, Ga., instead of the present two-unit fare of 13 cents is being considered by the Georgia Public Service Commission. Attorney Charles M. Hutchinson, representing the petitioners, stated that the present fare of 7 cents from Atlanta to Buckhead and of 6 cents from Buckhead to Oglethorpe was exorbitant, discriminatory and out of line with prices charged on other systems. Preston S. Arkwright, president of the Georgia Power Company, appeared in opposition to the petition.

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Recent Bus Developments

Rules in Favor of Indiana Buses

Interurban buses in Terre Haute, Ind., now may take on and discharge passengers on any street traversed by a railway despite the city ordinance against the practice. The judge in Superior Court recently granted a restraining order to that effect on application of Joseph H. Gregg and Andrew Carl, owners of the Blue & Gray Bus Line and the Hoosier Transportation Company. The Mayor and chief of police are especially directed not to enforce the city ordinance. This will, until further order of the court, stop arrests of bus drivers for picking up and discharging passengers along railway lines. Legality of the ordinance has been questioned in a petition filed with the Indiana Public Service Commission.

In this instance, both the car lines and the buses are being operated under certificates of convenience and necessity issued by the Indiana Public Service Commission. The avenues by which the buses reach the heart of the business district in Terre Haute and which are the nearest routes to this point are traversed by car lines. A similar situation prevails in several other Indiana cities. The order issued by the court is a temporary one, but will hold good until a final order on the petition for permanent injunction is issued. The court named no date for a further hearing of the case.

Line in Missouri Continued

The United Railways, St. Louis, Mo., has been granted a certificate of convenience and necessity for the continued operation of its bus line between Wellston and St. Charles, Mo., via Federal Highway No. 40. A permit was issued by the Missouri Public Service Commission, which now has jurisdiction over Missouri bus lines.

Roberto's Bus License Revoked in Boston

The bus license of Alphonso Roberto, owner of a bus line which operates between Revere and East Boston, has been revoked by the Massachusetts Department of Public Utilities because of violation of the terms. The commission finds that on Nov. 18, 1926, and on May 23 to 28 inclusive of this year Roberto on 49 instances took on a total of 210 passengers for hire at points where, under the terms of his license, he was not authorized to stop for that purpose. The commission also finds that he discharged passengers in violation of terms of his certificate.

This is the case which attracted considerable attention when it was given a public hearing, Roberto contending that despite the state rules and regulations a person has a constitutional right to get on and off a public bus wherever he pleases, and especially that he cannot be held prisoner in a bus when he desires to get out.

The restrictions had been placed in the certificate in conformity with the policy of protecting the electric railway, in this case the Boston Elevated, against unfair competition. This is the first time that the Public Utilities Department has revoked a bus license.

Buses on Old Jersey Car Route

The City Commission of Millville, N. J., has granted permission to the successor of the Millville Traction Company, Millville, N. J., to substitute buses for trolley cars on the Millville-Vineland route. The permit to operate buses extends to Dec. 31, 1930.

Bus Expansion in Lakewood

A hearing was held before the Public Service Commission on Sept. 22 on the petition of the Jamestown Street Railway, Jamestown, N. Y., to abandon its Lakewood railway line for buses operated by the Jamestown Motor Bus Transportation Company, its subsidiary. No opposition to the change was expressed, and it is expected that the commission will authorize the change.

The city's attorney, Ernest Cawcroft, declared that there was no objection on the part of the city provided there was assurance that the new service would be adequate to handle the traffic now handled by the railway. George L. Maltby, general manager, testified that an expenditude of $8,000 to $10,000 would be necessary to put the railway in good shape.

Buses on Utah Line

The Utah Light & Traction Company has been authorized by the Public Utilities Commission of Utah to discontinue service on its Murray-Midvale-Sandy line from the intersection in Murray of Second Avenue with State Street and to tear up its tracks on the line south of that intersection. As a substitute for street-car service on this line the company is to operate buses with the same frequency and at the same rates offered by its present railway service. Approximately 6 miles of street car track will be abandoned and superseded by bus service. This is the southern section of a line of about 14 miles which runs from Salt Lake City south to Murray, a community about 7 miles south of Salt Lake City, and thence south to the communities of Midvale and Sandy.

At the hearing the railway introduced evidence to the effect that the section of line which it seeks to abandon has been operated at a loss for several years.

Review of New Jersey Fares Refused

Chief Justice Gummere of New Jersey has denied an application by three municipalities and individuals in those municipalities for a writ of certiorari to review the decision of the Board of Public Utilities Commissioners readjusting bus and railway fare zones on the lines of the Public Service Transportation Company and the Public Service Railway.

However, the Chief Justice announced that, because of the importance of the case, he would permit the applicants to renew their plea before the Supreme Court *en banc* in Trenton in October if they wished.

The municipalities joining in the effort to have the decision reviewed were Irvington, Roselle Park, and Kenilworth.

At the offset, Chief Justice Gummere indicated that he could not see what standing the municipalities, as such, had in the case, holding that municipalities were created as governing bodies and that the case at point was not a governmental function. In the cases of the individuals joining in the application for the writ, he considered their interest small. He said:

Nothing has been shown to me, the Chief Justice said, in ruling upon conclusion of argument by counsel for the municipalities, that the Public Utilities Commission, by its act, has authorized the Public Service to charge excessive rates. It hasn't been suggested that the rates are excessive.

In arguing for the writ, Mr. Stewart said the application for the review was based upon the fact that no evidence of valuation of the property used and useful in the service by the buses had been submitted to the board or found by it.

Coach Application Opposed by New York Companies

The Equitable Coach Company, to which the Board of Estimate recently awarded a bus franchise for Manhattan, Brooklyn and Queens, has been directed by Transit Commissioner Leon G. Godley to amend its application for a certificate of convenience and necessity by filing a plan for financing. The contention that the petition on which the hearing was held was defective because it did not contain such a plan had been made by Clarence J. Shearn, counsel for the Brooklyn-Manhattan Transit Corporation and subsidiary surface line companies. Godfrey Goldmark, counsel for the Equitable company, immediately filed an amended petition, which he had held in reserve.

The amended petition proposed as a method of financing the issuance of $4,000,000 of 6 per cent first mortgage bonds, $6,500,000 of 5½ per cent equipment trust certificate notes, 75,000 shares of preferred stock without par value but entitled to a dividend of $7 a share and 225,000 shares of common stock of no-par value. All of these securities are to be issued when designated by the commission, and the

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entire financial plan is contingent on the commission's granting a certificate for all the routes specified in the franchise.

Mr. Shearn declared that millions of Brooklyn passengers yearly would be inconvenienced, because the Brooklyn surface lines would be affected severely if the application were granted and the Equitable company permitted to operate buses.

Mr. Shearn said that the Brooklyn surface lines carried 530,000,000 passengers each year. William Wallack, representing the New York Railways, declared that it was the duty of the commission to protect the surface lines as existing transit facilities, not through favoritism, but in the public interest.

The Union Bus Corporation objected to the granting of the certificates on two grounds. The first of these was that no statutory public hearing, as required by law, was held by the Board of Estimate before granting the Equitable company a franchise. The second was that the city had sustained a loss of $100,000 by awarding the franchise to the Equitable company, as the Union Bus Corporation offered the city a guaranteed minimum return of $500,000, as compared with $400,000 offered by the Equitable company.

Legal Point Raised Over Brockton Fair Bus Permit

A temporary bus line service to the Brockton Fair is being arranged by the Eastern Massachusetts Street Railway, Boston, Mass., under a license from the Brockton city authorities. An interesting point of law has arisen in this connection. Licenses issued by the city authorities are not revokable by the city, under Massachusetts law, and some opposition to confirmation is developing before the Public Utilities Department on the ground that it might mean that the railway could operate this line to the Brockton Fair grounds every year. The question has been assigned for a public hearing.

"Busmen, Don't Be Road Hogs"

In a letter to all officers, inspectors, chauffeurs and other employees of the County Transportation Company, the bulk of the stock of which is owned by the New York & Stamford Railway, and which operates a network of bus lines in Connecticut and the Long Island Sound section of Westchester, Leverett S. Miller, president, has laid down a code of courtesy.

In this code or pronouncement there is no place for "road hogs." Mr. Miller suggests practicing the rule of judgment tempered by recognition of the rights of others. He says that by encouraging the practice of common courtesy among drivers, public and private, the number of highway casualties in Westchester will be lessened and the lamentable condition existing in that section as elsewhere will be improved.

Financial *and* Corporate

Gary Railways to Issue $363,000 Common Stock

Authority to issue a total of $363,000, par value, of common stock was granted on Sept. 19 to the Gary Railways in an Indiana Public Service Commission order. The purpose of the new issue, as alleged in the company's petition, is to reimburse the treasury for money used in purchasing the common stock of the Shore Line Motor Coach Company, a supplementary motor coach system jointly controlled by the Gary Railways and the Chicago, South Shore & South Bend Railroad.

Massachusetts Railway in Plight

The Shelburne Falls & Colrain Street Railway, operating between Shelburne Falls and Colrain, in Massachusetts, the revenues of which have been greatly enhanced by freight transportation from the Griswoldville Manufacturing Company, has been notified by the latter that it will transport all its freight by means of motor trucks after Nov. 1. It is thought unlikely that the road will be able to continue after the loss of this substantial revenue. This line is 7 miles long. It was built 31 years ago and gives the industries in that section their only connection with railroad facilities by means of a cement bridge across the Deerfield River to connect with the Boston & Maine line.

Montreal Company Given Time Extension on Property Disposal

The City Council of Montreal, Canada, has adopted the report of the city executives favoring the extension of time to the Montreal Tramways to sell certain properties it possesses in several city wards. Delay in disposing of them was due to the state of the real estate market which has necessitated this further extension of two years to January, 1930. The contract with the city provided for disposal of land in various wards within five years.

Preferred Stock Offering in Richmond

An issue of $1,965,600 of 6 per cent cumulative preferred stock of the Virginia Electric & Power Company, Richmond, Va., was offered Sept. 19 at $97.50 a share and a yield of 6.15 per cent. The par value of the stock is $100 a share. The stock was issued to provide for extensions and improvements of equipment throughout the area served by the company in Virginia and North Carolinia.

Employees of the Virginia Electric & Power Company were given an opportunity to purchase the stock before it was placed on general sale. On the partial payment plan an initial payment of $7.50 was made on each share and the balance in nine months at $10 each. In Richmond, 2,000 more employees bought 400 more shares of the latest issue than they purchased of the issue of $1,500,000 brought out in December of last year.

Decrease in Boston Traffic in July

The cost of service of the Boston Elevated Railway, Boston, Mass., exceeded the revenue in July, 1927, by $353,208, against $393,028 in July, 1926. The number of revenue passengers carried was 26,167,466, compared with 27,160,300 for July, 1926. Total miles operated numbered 4,491,667, against 4,809,609 in July, 1926. These figures included bus-miles of 465,875 in July 1927 and 417,165 in July 1926.

President Baker Defends Fitchburg & Leominster Road

Charles S. Cummings, Boston, has filed a bill in equity in the Superior Court in Boston asking that a receiver be appointed for the Fitchburg & Leominster Street Railway or that the Boston Safe Deposit & Trust Company, trustee under the mortgage indenture, be ordered to take possession of the road for the bondholders. Mr. Cummings, as the owner of $5,000 of bonds of the company, declares the company has defaulted on interest payments and that it owes various banks $710,800 in unsecured notes. He wants the road enjoined from paying any more interest on the unsecured notes until the bondholders are paid in full.

Mr. Cummings alleges that the $300,000 of bonds, due on Feb. 1, 1921, were extended for five years at 7 per cent; that up to 1926 on this five-year extension the railway paid interest on the bonds and also paid $25,700 on secured debts and $231,686 on unsecured debts, a grand total of $315,886, or a sum more than sufficient to pay the bonds in full.

In 1926 the plan was adopted through action of a bondholders' and note holders' committee to extend these bonds another five years at a lower rate of interest. A new plan was made for handling the unsecured notes by which the noteholders would have their notes maturing each year. Under this plan no provision was made to establish a fund to pay off the bonds, it was claimed. Mr. Cummings charges that in the last eighteen months, holders of unsecured notes have received $14,216 in interest and that bondholders of the Leominster, Shirley & Ayer Street Railway have received $6,000 in interest. He complains that the note holders will have received $106,620 and that the holders

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of the bonds of the Leominster, Shirley & Ayer Street Railway will have received $20,000 in interest to the damage of the Fitchburg & Leominster bondholders.

President Defends Action

When he was informed about the bill in equity Emerson W. Baker, president of the railway, said that the company's property is perfectly protected by the so-called "after acquired" clauses in the trust mortgage. He said:

All that Mr. Cummings wants, apparently, is to get paid par value for his bonds right now and to let the hest wait until the end of the reorganization period. Our hope and endeavor is to improve the property and so improve the condition of the bonds. It is now far better than when we took hold of it on Oct. 21, 1926.

Mr. Cummings is in error when he alleges the property is no better off than it was before. The rolling stock and other equipment are far better than ever before. The amusement park has been rebuilt, much work has been done on tracks and three rotary converters have been installed. Take, for instance, the bus terminal. It has been repaired and a heating plant put in.

As a matter of fact, the bonds are hard to get. Those who hold them now seem to be well satisfied with the progress made and are very reluctant to part with them.

The remark by Mr. Cummings about interest is misleading. All he would have to do to get the interest on his bonds would be to present them at the Boston Safe Deposit & Trust Company. It has awaited since 1926 at 5 per cent. This is one-half per cent more than the rate originally issued. His declaration of 7 per cent I cannot understand, inasmuch as that rate operated from 1921 to 1926 and ended then.

Mr. Cummings' prayer relating to payment of sums to unsecured creditors I would answer by saying we have not paid out anything since Feb. 1, 1927, and are not planning to pay anything now. I do not see how anything would be gained by a trustee or receivership. We are operating at a profit so far as revenue and expenses are concerned. For the six months ended July, 1926, there was a loss of $20,000, but for the six months ended July, 1927, we made $26,000, a change of about $46,000 for the better.

This does not mean that the company is prosperous. It merely means we are operating at a profit and expect to pay out of our current income for all new equipment over a period of years. We do not expect ever to pay more than a small percentage by way of compromise with the noteholders and very old unsecured creditors. In other words, the capital structure ultimately will have to be greatly reduced, but this has no present effect on the quality of service rendered.

Court Disallows Contention

The Charles S. Cummings bill, heard in equity session recently at Boston, Mass., was denied by Judge Marcus Morton on the grounds that there was no dispute as to facts in the case and that whatever question in law might be raised it would not justify the court in issuing an injunction to prevent payment of interest. Such a move would it was brought out, prevent the proper and successful negotiation of plans for the betterments of the company to the general advantage of the public.

Deficit in Indianapolis in 1926

The net earnings of the Indianapolis Street Railway, Indianapolis, Ind., for the year ended Dec. 31, 1926, less taxes, were $880,575, against $1,116,924 for the year previous. After all deductions there was a deficit of $203,514. This compares with a balance in 1925, after all deductions, of $41,175.

An extensive improvement program was carried out by the company. This included track and paving work, the installation of temporary cross-overs, replacements, renewals and the relocations of loop track. Five new substations are now well under way. Power is to be supplied by the Indiana Electric Corporation, at a material reduction, and the operation of cars greatly improved.

The company is at present operating 33 buses, fifteen of which are used on nine feeder lines. The service, while greatly accommodating the public and protecting the company from further inroads of competing bus lines, has lacked patronage and resulted in a net loss from operation, including depreciation, of $203.507 for the year 1926. In addition to the general news on the company's bus activities the report refers to the proposed merger of the Peoples Motor Coach Company and the Indianapolis Street Railway.

During the past year the company purchased 370 Johnson registering fare boxes and 1,000,000 tokens at an expense of $31,105. The token system was started on Jan. 1, 1927. By this the company hopes to eliminate the expense of printing tickets and other expenses in the counting room. Beside 59 one-man cars are now in operation in Indianapolis, resulting in a saving in operating cost. More cars are to be converted into the one-man operating type during the year 1927.

The board of directors was unable, according to the report, to declare dividends on the Indianapolis Street Railway preferred stock during the year 1926 on account of decreased earnings, due principally to the constantly increasing use of privately owned automobiles and to serious loss from bus competition.

During the year 1926 there was paid to employees and beneficiaries of the Pension Fund and Benefit Association $29,000, of which sum the company contributed $5,000. These two associations since their organization have disbursed nearly $200,000 as subsidies for the sick and surviving members of families of deceased members.

INCOME ACCOUNT OF THE INDIANAPOLIS STREET RAILWAY

For Year Ended Dec. 31, 1926

Gross Earnings:	
Passenger receipts—city lines	$4,425,529
Transfer receipts—city lines	310,866
Track rentals interurban passenger cars	105,994
Track rentals interurban freight cars	53,238
Chartered cars	736
Advertising	30,600
Dog permits	1,151
Rent of land and buildings miscellaneous	27,417
Rent of terminal building and stations	247,467
Sale of power	6,126
Rent of equipment	1,315
Miscellaneous income	2
Receipts, Broad Ripple Line	86,689
Bus receipts	214,703
Interest, discount	6,954
Total	$5,518,794
Operating Expenses:	
Maintenance of way and structures	$610,914
Maintenance of equipment	502,982
Special maintenance per order of Public Service Commission of Indiana	
Operation of power plant	756,813
Operation of cars and buses	2,028,500
General expenses	444,135
Total	$4,343,346
Net earnings	$1,175,447
Less taxes	294,872
Total net earnings, less taxes	$880,575
Deductions:—Bond Interest	
Interest on $4,000,000 Citizens Street Railroad 5's	$200,000
Interest on $4,547,000 Indianapolis Street Railway 4's	183,484
Interest on $3,570,000 Indianapolis Traction & Terminal Company's 5's	178,663
Interest on $285,000 Broad Ripple Traction Company's 5's	12,361
Interest on trust equipment notes	2,684
Interest on Indianapolis car equipment company preferred stock	4,250
Interest on notes	49,497
Total deductions	$630,939
Surplus (exclusive of accrued depreciation)	$249,635
Deductions from surplus:	
Indianapolis Street Railway sinking fund	$80,000
Indianapolis Traction & Terminal Company sinking fund	73,150
Dividends unpaid on $5,000,000 preferred stock 1926	300,000
Total deductions	$453,150
Balance (deficit)	$203,514

COMPARATIVE OPERATING STATEMENT OF THE INDIANAPOLIS STREET RAILWAY

	1926	1925
Earnings:		
Passenger receipts—City lines	$4,425,529	$4,754,227
Transfer receipts—City lines	310,866	176,492
Miscellaneous earnings—Track rentals	782,398	605,649
Gross earnings	$5,518,794	$5,536,369
Maintenance of way and structures	$610,914	$631,678
Maintenance of equipment	502,982	517,988
Special maintenance expended from revenue from increased fares by order of Public Service Commission		20,708
Total maintenance	$1,113,896	$1,170,375
Operation of power plant	$756,813	$734,466
Operation of cars	2,028,500	1,682,517
General expenses	444,135	445,462
Total operation expenses	$4,343,346	$4,032,821
Net earnings	$1,175,447	$1,503,548
Less taxes	294,872	386,624
Net earnings, less taxes	$880,575	$1,116,924

Railway Net of Northern States Power Shows Improvement

The gross earnings of the street railway department of the Northern States Power Company for the year ended Dec. 31, 1926, were $268,704, representing 0.95 per cent of the total gross. In 1925 the gross earnings were $277,578. Net earnings in 1926 showed a loss of $30,654 against a loss of $61,858 for the year previous. This company, controlled by the Northern States Power Company of Delaware, a Byllesby property, operates 16 miles of line connecting Fargo, N. D., and Moorhead and Dilworth, Minn.

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Evanston Railway Asks Authority for Refunding Issue

Application for authority to issue $15,000, par value, of general mortgage bonds was made to the Illinois Commerce Commission on Sept. 14 by the Evanston Railway, Evanston, Ill. The company's petition states that the new bonds are to be issued in lieu of first mortgage bonds in the amount of $15,000 recently paid and canceled.

Fight Over Goshen, Ind., Discontinuance

A recent ruling by Judge Thomas Slick in the federal court at South Bend, Ind., granted permission to R. R. Smith, receiver of the Chicago, South Bend & Northern Indiana Railway, to discontinue service in Goshen. The receiver cited the constant decrease in revenue in Goshen for several years as the reason for the discontinuance. The City Council, however, will oppose the court ruling because of a finding clause in the franchise. The legality of the franchise likely will come before the courts.

Partial Discontinuance in Syracuse Allowed

The Public Service Commission granted on Sept. 23 the petition of The New York State Railways for permission to discontinue service on its Green Street line in Syracuse. It was established at the hearing that the line was operated at a loss and that there were other means of public transportation available to the patrons. Commissioner Brewster in his memorandum accompanying the order said that the loss to the petitioner through this operation exceeded its income therefrom by more than 50 per cent and further that no real public necessity demanded the continuance of service.

A. G. & E. Properties Under New Owners

The American Electric Power Corporation, of Delaware, which now owns all the voting stock of the Pennsylvania Gas & Electric Corporation, has purchased the American Gas & Electric Company's controlling interest in the stock of American Electric Power Company, which owns control of utility properties in and near Wilmington, Del., and Springfield and Dayton, Ohio. The purchase of this holding company stock in no way anticipates any change in the local management of the subsidiary properties except that they will come under the general management and supervision of Stevens & Wood, Inc., New York, a corporation that for many years has operated extensive public utility properties in Ohio, Pennsylvania, New York, Virginia, District of Columbia and North and South Carolina.

Transportation service will be furnished to and about Wilmington, Del., and Media and Chester, Pa., and to Springfield and Dayton, Ohio, by the Peoples Railway of Dayton, Ohio, the Wilmington & Philadelphia Traction Company, Wilmington, Del., and the Springfield Railway, Springfield, Ohio.

Eight Months Net of Eastern Massachusetts $546,377

Net income of the Eastern Massachusetts Street Railway, Boston, Mass., after all charges for the month of August, was $42,409, compared with $38,433 a year ago. Gross operating revenues for the month were $744,925, against $757,134, and income after taxes was $223,167, compared with $222,656. For the eight months period ended August, 1927, the net income after all charges was $546,377, compared with $530,067. Gross operating revenues for this period were $6,326,620, against $6,373,659, and income after taxes was $2,309,846, compared with $2,316,886.

Balance Higher in Reading

For the year ended July 31, 1927, the operating revenue of the Reading Transit Company and subsidiary companies, Reading, Pa., was $2,935,181, against $2,981,253 for the period ended July 31, 1926. Operating expenses and taxes, excluding depreciation and maintenance, decreased from $1,715,145 to $1,619,880 for the 1927 period. Total deductions from income left a net income of $210,073 in 1927 and $159,560 in 1926. After the provision for dividend on preferred stock the balance of net income was $90,928 against $40,415 for the year ended July 31, 1926.

Kaw Valley Sale Confirmed

The sale of the Kansas City, Kaw Valley, & Western Railway, Kansas City, Mo., was confirmed on Sept. 14 by Judge John C. Pollock of the federal court in Denver. The sale was made to a group headed by Jo Zach Miller, Jr., 1001 Commerce Building, Kansas City, and George W. York, Cleveland. The sale price was $300,000. Mr. Miller is president and Mr. York vice-president of the new company. The line has been in receivership several years. It operates between Kansas City and Lawrence, Kan.

Second Avenue Railroad, New York, Sold

On behalf of the preferred certificate holders' committee Arthur W. Hutchins has bought for $500,000 all the tangible assets of the Second Avenue Railroad, New York. The sale was made at public auction conducted by Joseph P. Day, who announced that the sale was subject to the confirmation of the Supreme Court. The assets comprise the real estate, franchises, trackage, agreements and contracts. The real estate included the entire block on First and Second Avenues between 96th and 97th Streets.

An action started on behalf of George E. Warren and others against the Second Avenue Railroad brought about the sale, which was directed by a judgment of the Supreme Court of New York County and under the direction of John C. Clarke, referee.

The assets were purchased provisionally and subject to the confirmation of the Transit Commission's acceptance of the reorganization plan adopted by the certificate holders' committee.

Improvement in Revenue from Omaha Property

The report of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the month of August, filed with the Nebraska Railway Commission, continues to show a steady decrease in traffic exceeding 3 per cent, compared with the month of August, 1926, but the financial results of operation are better. Revenue for the month was $216,093, a decrease of $9,000 over August, 1926, but operating costs were cut $14,000, to $166,173. The net after payment of taxes was $26,744, and as interest charges are $37,479 a month, the deficit was $11,412, compared with $20,611 for August a year ago.

Attractive Railway Securities Await the Knowing Investor

The fact that progressiveness is permeating most of the electric railway industry and that in view of this condition opportunities abound among its securities was emphasized by Clarence V. Price, of Price and Company, in an article in a recent issue of the *Financial World*. As proof of this spirit of progress he cites arguments such as trained men, light-weight and one-man cars, weekly tickets, bargain rides and many other features of modern merchandising methods whereby service is really sold to prospective riders. In addition he refers to the changed attitude on the part of the railway managements who now take the public into their confidence, seeking their opinions and reactions as well as catering to their conveniences and comforts. Such conditions convince Mr. Price that many investors are overlooking some unusual bargains in the electric railway security field. He says that these have a real promise for the future. "Too many investors, perhaps," he says, "still are looking on the local transportation industry with 1915 eyes. The best advice that I could give them is to familiarize themselves with current conditions."

Discontinuance Sought in Hillsboro

John H. Mitchell, manager of the Illinois Power & Light Corporation, has applied to the Illinois Commerce Commission for authority to discontinue the two railway routes operating in Hillsboro, Ill.

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Legal Notes

FEDERAL CIRCUIT COURT — *Law prohibiting competing buses on certain streets is valid.*

An Oklahoma statute and a city ordinance which prohibited the operation of buses on streets occupied by street railway lines or on the first two streets on either side of a street so occupied and parallel to it, was held not to be discriminatory and invalid because they excluded from such prohibition motor buses operated by the street railway company as part of its transportation system. The court said that competition, like monopoly, may be restrained for the public welfare; the test in each instance is the public good. [People's Transit Co. vs. Henshow, S.L. 20 Fed. (2D), 87.]

FEDERAL DISTRICT COURT — *Rulings on Valuation of Public Utility Property.*

In an extended decision, the District Court for the District of Idaho, ruled on methods of valuing real estate used in public utility service and on allowances for overhead, contingencies, contractors fees, good will, working capital, depreciation, reasonable return and other features in connection with valuation and rate making. [Idaho Power Co. vs. Thompson et al., 19 Fed. (2d), 547.]

KENTUCKY—*Street Railways May Sue to Restrain Operation of Illegal Bus Lines.*

A street railway company, as a taxpayer, can maintain a suit to restrain the operation of a competing bus line over city streets, where the competing line has no franchise. The fact that the railway company itself may be operating bus lines on some streets without a specific franchise does not prevent it from bringing suit to enjoin the operation of a competing bus line. [People's Transit Co. vs. Louisville Railway, 295 S. W., 1055.]

MASSACHUSETTS.—*Only Duty of Railway on Reservation Is to Refrain from Wanton or Reckless Conduct.*

A railway company had laid tracks on a reservation in the center of a street, and a person intending to become a passenger, while crossing the reservation diagonally at a place where there was no cross walk was struck by a car. It was held that the railway owed him no duty except to refrain from wanton or reckless conduct. [Fernald vs. Boston E.R., 156 N. E., 692.]

MASSACHUSETTS—*Failure to Register Makes an Auto Trespasser.*

In an action for damage to an auto resulting from a collision with a street car of the defendant, under circumstances warranting a finding of due care on the part of the plaintiff and negligence on the part of the defendant, it appeared on the day before the accident the plaintiff removed from his auto the motor, listed on his certificate of registration and installed a new motor therein, but obtained no new registration since the installation. It was held that the plaintiff was a trespasser on the highway and could not recover for damages to his auto through the negligence of another. [Wallace vs. No. Bedford & Onset St. Ry., 155 N. E., 660.]

MASSACHUSETTS.—*Passenger on Truck Is Guilty of Contributory Negligence.*

An experienced truck driver who was riding in another truck as a guest was injured while the truck was running on the wrong side of the road and was struck by an electric car. Both the driver of the truck and his guest were held to be guilty of contributory negligence. [Thorpe vs. Boston E.R., 156 N. E., 748.]

MASSACHUSETTS—*Driver Trying to Start Stalled Car on Track Without Looking for Approaching Street Car Held Negligent.*

An automobile became stalled on a straight railway track and the driver started to crank it without looking to see whether any cars were coming. The railway was not responsible when he was struck. [Loyle vs. Boston Elevated Railway, 157 N. E., 356.]

MISSOURI—*Refusal of instructions on sounding gong upheld.*

An action was brought under the humanitarian doctrine for personal injury when a street car hit an automobile which was being driven on the left side of the street and in a rut in the car tracks. The plaintiff claimed that if the car gong had been sounded the driver would have had warning, but the request of the company that the court instruct the jury there was no evidence that such failure to use the gong was the approximate cause of the collision was refused. This refusal was upheld by the Supreme Court. [Perry vs. Fleming et al., 296 S. W., 167.]

MISSOURI—*Wording of Ordinance for Punishing Transfer Abuse Is Important.*

An ordinance passed by the City, making it unlawful for any person not connected with the railway company to sell, barter, or exchange for any consideration a street railway transfer, or give it away for the purpose of enabling another person to use it for passage, or any person so to use it, or to alter the transfer so that it could be used for a round trip, to be guilty of a misdemeanor. The Court held that the wording of this ordinance attempted to regulate the rates and practices of the company which the city had no power to do. The Court pointed out, however, that an ordinance prohibiting the use or issue of transfers in violation of the rules and regulations of the street car company, would be valid, as these rules presumably would have the sanction of the State Public Service Commission. [Ex Parte Packman, 296 S.W., 366.]

MONTANA — *For Taxation, Electric Railway Track and Poles May Be Considered Personal Property.*

For the purpose of taxation, the State of Montana classified property into seven groups of which one includes real estate and improvements and one personal property. The rates were different on these two. By an amendment of the act, a street railway track was placed in the "personal property" group. The present case was upon the proper grouping of the overhead construction and poles which, for reasons given in the decision, were also placed in the "personal property" group. [Butte Electric Railway vs. Brett, 257 P., 478.]

NEW JERSEY—*License Required by Bus Hauling Employees of Single Industrial Plants.*

A bus hauled only employees of a single industrial plant to and from it and made no stops to receive or discharge passengers in a town where it had no municipal license. This was held to be a violation of a statute which requires motor buses to receive municipal licenses from the municipalities through which they operate and have such licenses approved by the Board of Public Utility Commissioners. [Doskovich vs. Board of Public Utility Commissioners, et al., 138 At., 110.]

OHIO—*Judicial Notice Will Be Taken of Differences Between Buses.*

A bus company operated some 16-passenger buses under authority of the Public Utilities Commission, but the State Supreme Court issued an order at the request of a railway company that the bus company must use 7-passenger buses instead of those employed. The bus company then removed 9 seats in each of the 16-passenger buses, but the Court held that this was not in compliance with its order. [Scioto Valley R. T. Co. vs. Public Utilities Commission, 157 N. E., 475.]

WASHINGTON — *Passenger Alighting in Dangerous Place Must Exercise Special Care.*

At a point where an accident occurred there was a single track in the middle of a street and only on one side of this track the street was paved. On this paved side, traffic moved in both directions. A passenger was injured after alighting from a car by being hit by an automobile travelling in the opposite direction from the car. The passenger had an unobstructed view and as good an opportunity to see possible danger as the car operator. The decision of the jury in favor of the railway was upheld. [Jones vs. City of Seattle, et al., 157 P., 393.]

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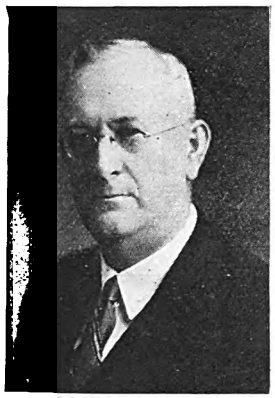
Personal Items

Cincinnati Men in New Posts

Added Responsibility for Engineers Under New Power Arrangement —Careers of Men Involved, Messrs. Venning, Clark, Swift, Noertker and Genrick, Are Reviewed

FURTHER details available about the promotions in the personnel of the Cincinnati Street Railway, Cincinnati, Ohio, and the assignment of additional duties to officers of the operating department of the railway indicate more minutely than a previous item the significance of the changes. To provide for the new power distribution plans under which the railway will get all its power from the Union Gas & Electric Company through a system of eighteen *automatic* substations, the responsibilities of Messrs. Venning, Clark, Swift, Noertker and Genrich are increased.



F. J. Venning

H. L. Swift

W. P. Clark

F. J. Venning will continue as superintendent of power and will have jurisdiction over the Pendleton power house and all operations incident to the production of power. He will have charge of the transmission lines to the point where current is delivered to the switches in the substations and all feeder lines from the time they leave the substations, as well as the overhead trolley lines. He will also supervise the maintenance and operation of the Mount Adams Incline. Mr. Venning began as oiler for the Westinghouse Electric Company in 1889. He entered the street railway field in 1893 as barn foreman for the Citizens Traction Company of Pittsburgh, where he later became superintendent of maintenance of way and overhead lines. He remained in Pittsburgh until January, 1910, when he was appointed superintendent of construction for the Cincinnati Traction Company. He was made superintendent of overhead lines for this company in June, 1918, and in 1920 was given additional jurisdiction over shops and equipment. In February, 1926, he was made superintendent of power for the new operating company in Cincinnati, the Cincinnati Street Railway.

W. P. Clark was appointed assistant superintendent of track and roadway. He will assist the superintendent in handling the large program of track reconstruction work which is being carried on by the company. Mr. Clark had also served the traction company prior to the reorganiation in 1925. After his graduation from Tri-State College at Angola, Ind., as civil engineer in 1921, he went to the company as material man. In 1924 he was made paving engineer.

Harley L. Swift was appointed superintendent of substations and will have jurisdiction over the maintenance of all present substations and the construction of the new substations, including the installation of the equipment. He went to the Cincinnati Street Railway in January, 1927, as assistant superintendent of maintenance of way, leaving his position as superintendent of factory No. 14 of the American Window Glass Company at Monongahela, Pa. He is a graduate of Penn State College, where he received his degree in 1914 as mechanical engineer.

J. A. Noertker was appointed electrical engineer and will look after the details of the new substation installation. He entered the company's employ in 1921 as draftsman after his graduation from the University of Cincinnati as electrical engineer.

H. C. Genrich was appointed electrician and will continue to handle the inspection and maintenance of the present substation and to assist in constructing the new stations. He has been with the company since 1895 and has served as chief electrician since 1898.

L. S. Ready Takes Up Commissioner's Duties

Lester S. Ready, vice-chairman of the board of directors of the Key System Transit Company, Oakland, Cal., and formerly president of that company, has completely severed his connection with that utility. The California Railroad Commission, of which he was formerly chief engineer, has announced that arrangements have been concluded with Mr. Ready to take charge of the preparation and presentation of the commission's testimony and evidence in the pending Pacific Telephone & Telegraph rate case.

Mr. Ready is a graduate of the University of California, College of Electrical and Mechanical Engineering, class of 1912. For four years he was chief engineer of the commission and was connected with the engineering department of the commission for thirteen years. He has had charge of the various engineering investigations in connection with all the varied rate proceedings before the commission in recent years.

Daniel Durie Made General Manager of West Penn Lines

H. L. Mitchell, president of the West Penn Railways, Pittsburgh, Pa., on Sept. 27 announced changes in the operating organization of the company. Two operating divisions have been created and a general manager has been named for each of the two sections of the system. Daniel Durie, Connellsville, Pa., who has been general superintendent of what is known as Territory "A," is promoted to the general managership of the Pennsylvania Division. The West Virginia and Ohio Division is under the direction of A. C. Spurr, Wheeling, W. Va.

Three co-operating departments are included in the railway's organization, all located at Pittsburgh. J. L. Fritsch, chief engineer of the company since its beginning, has charge of engineering and construction standards. James McFall, general claim agent of the West Penn Railways and the West Penn Power Company, is in charge of the claims department. H. K. Breckenridge, Pittsburgh, development engineer, is in charge of bus developments and standards.

H. S. Metcalfe, who has been in charge of public relations, has been appointed assistant to Walter S. Finlay, Jr., president of the West Penn Electric Company, in the publicity and public relations field, but he will continue to serve the railways department as his services are needed.

J. O. Horton, who has been in the Pittsburgh office, is transferred to Connellsville and appointed assistant to Daniel Durie, general manager. Ernest R. Kooser, Connellsville, assistant superintendent of Territory "A," becomes superintendent of transportaiton in that division, and Joseph Black, located at New Kensington, is named superintendent of transportation in Territory "B."

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Manufactures and the Markets

100 Articulated and One-Man Units for Cleveland

Shortly after the Cleveland convention an order will be placed by the Cleveland Railway for 100 street cars part of which are to be the duplex articulated type and the rest for one-man, two-man, front-entrance, center-exit operation. Samples of each type are under construction and will be exhibited at the convention. Authorization for the purchase was made about two months ago by the City Council of Cleveland, according to Joseph H. Alexander, president of the traction company. The order is in addition to the 36 single-deck buses, ten de luxe single-deck buses and six double-deck units which were purchased from the White Motor Company, Yellow Coach Company, and Six-Wheel Company respectively.

Rolling Stock Order Placed by German State Railways

In connection with the electrification of the railways in Silesia and Saxony, the German State Railway Company has lately placed orders for more than 80 electric locomotives and other rolling stock to an estimated value of $850,000,000. Brown, Boveri & Company, Mannheim, in conjunction with the Krauss Locomotive Works, Munich, are to supply seven 2,200-hp. express locomotives and the A.E.G. and the Siemens-Schuckert Company, Berlin, in conjunction with the Borsig Company of Tegel, 33 2,600-hp. engines. The A.E.G. and the Siemens-Schuckert concerns are also to supply twelve heavy goods engines and eight shunting locomotives, while the Bergman Electric Company and the Schartzkopf Company, Berlin, are to supply five light express locomotives and 23 goods engines.

Fire Destroys 25 Trolley Cars in Canada

Fire last Sunday night destroyed a wing of the Ottawa Electric Street Railway carhouse in the Rockcliffe district and 25 trolley cars, with an estimated loss of $200,000. An early investigation points to the blaze having originated from defective wiring. Breaking out near the front door of the building, the conflagration soon assumed uncontrollable proportions and swept through the entire wing, rapidly reducing it to ashes. Besides the 25 emergency trolley cars lost, a track bonding car and a track grinder car were destroyed. The entire loss is covered by insurance.

Two other wings of the main carhouse were saved. The structure is within a stone's throw of Rideau Hall, official residence of the Governor-General, and but for an opposite wind these buildings would have been endangered by myriads of sparks thrown up by the blaze. Firemen had a strenuous task in keeping the flames from catching the thick bush, which stretches for miles at the rear of the carhouse and forms Rockcliffe Park, a scenic beauty spot of the capital.

Subway Approach Planned by I.T.S. for St. Louis

Illinois Traction System, Springfield, Ill., has engineers at work to devise plans for a co-ordinated subway and elevated railway system to connect its downtown terminal and station at Twelfth and Lucas Avenue, St. Louis, Mo., with a proposed new approach to the McKinley Bridge which spans the Mississippi River at Salisbury Street.

The new system would give the railway approved access to the downtown section for its freight and passenger business and eliminate many grade crossings in north St. Louis. Three tentative plans are under consideration, but the preliminary studies have not advanced sufficiently to warrant any announcement at this time. It probably will be January before anything definite will be decided.

Worcester's $75,000 Bus Purchases Approved by Commission

The Worcester Consolidated Street Railway, Worcester, Mass., has entered into a conditional sales agreement with the Yellow Manufacturing Sales Corporation, Chicago, for the purchase of seven motor coaches, which has been approved by the Massachusetts Department of Public Utilities as being "reasonable and proper and for a lawful purpose."

The coaches are to have special bodies, manufactured by the Lang Body Company. The conditional sale calls for the payment of a sum not exceeding $75,410, with 6 per cent interest, in installments on specified dates.

Twin Coach May Appear in New York

Contingent upon the outcome of franchise hearings before the New York Transit Commission and legal proceedings by other transportation companies concerned, the Equitable Coach Company, New York, N. Y., will operate Fageol Twin Coaches on crosstown lines in Manhattan and ordinary street-car type city buses in Brooklyn.

Should the necessary permission be secured, the company will place in service 163 Twin Coaches in Manhattan, establishing a crosstown service with a two-minute rush-hour headway. An indeterminable number of the street-car type buses will be purchased for use in Brooklyn.

Electric Locomotive Sought for South Africa

The South African Railway Administration is inviting tenders for an electric freight locomotive. The authorities desire to find an electric unit that will be a big improvement on those in use at present, and it is their intention to test this single unit against the three units now being employed. Should the experiment prove successful, it is understood that this contract for a single locomotive will be followed by one of the largest contracts in the history of the South African railways.

Delivery of Detroit Cars Will Begin in October

Delivery of the 125 Peter Witt type cars ordered on July 30 by the Department of Street Railways of the City of Detroit from the Cummings Car & Coach Company, Chicago, will begin in October. Following the first delivery eight cars will be completed each week. Payment for the cars, as outlined in the July 23 issue of ELECTRIC RAILWAY JOURNAL, is being made by an initial installment of $250,000 and $18,000 per month over a ten-year period from Aug. 1, 1927, to July 1, 1937, inclusive. The units are of the single-end type and are designed for two-man operation.

Specifications for the units follow:

Number of cars ordered	125
Type of unit	Peter Witt two-man, motor, passenger, city, single end, double truck
Seating capacity	52
Builder of car body	Cummings Car & Coach Company, Chicago
Weight, total	36,000 lb.
Bolster centers, length	23 ft. 9 in.
Length over all	48 ft. 5 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 4 in.
Window post spacing	29½ in.
Body	Steel
Roof	Arch
Doors	Peter Witt
Air brakes	Westinghouse DH-16
Armature bearings	Plain
Car signal system	Faraday
Compressors	DH-16
Conduit	Flexible
Control	K-35 HH
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Front folding, center slide
Energy-saving device	Cleveland
Fare boxes	Cleveland
Finish	Lacquer
Floor covering	Wood
Gears and pinions	Grade M. & B. P.
Glass	D. S. A.
Hand brakes	Peacock
Hand straps	Rico No. 7
Heaters	Gold
Headlights	Golden Rod
Headlining	Three-Star Agasote
Interior trim	Cherry
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Electric Service Supplies Company
Motors	Four General Electric 265, four Westinghouse 510, inside hung
Roof material	Wood
Sash fixtures	Edwards
Seats	Rattan
Seat spacing	29½ in.
Seating material	Rattan
Steps	Stationary
Step treads	Kass
Trolley	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	Detroit Street Railway, standard
Trucks	Standard
Ventilators	Railway Utility Company
Wheels	26-in., steel
Wheelguards	H. B.

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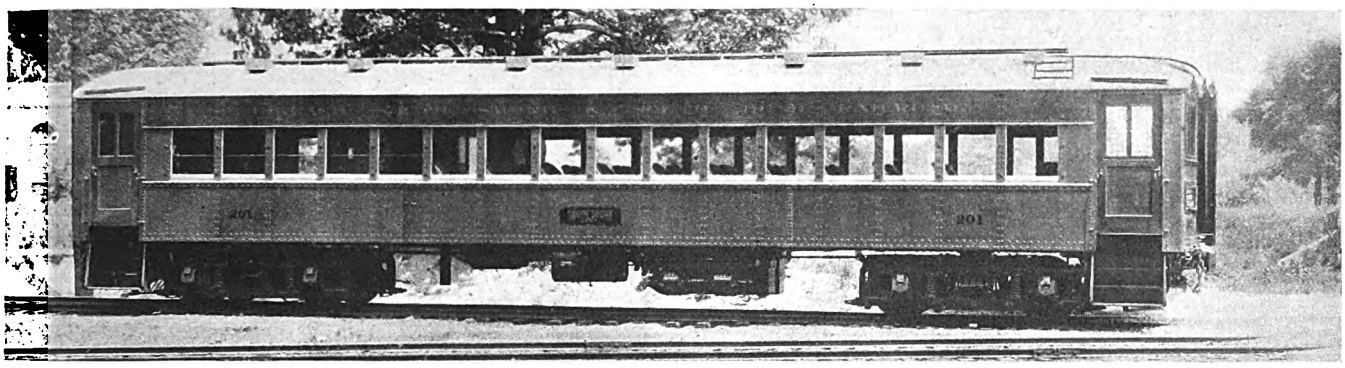
Twenty New Steel Motors and Trailers for the South Shore Line



Ten motors and ten trailers of this type for the South Shore Line

Delivery of the first of twenty new all-steel motor cars and trailers built by the Pullman Car & Manufacturing Company was made recently to the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. The initial consignment of new equipment, which was ordered in January, consisted of five trail cars. They were received July 30. Five additional trailers were expected to arrive by Aug. 8, while the ten motor cars were scheduled to be in service shortly after. Reference to delivery appeared in the JOURNAL of July 30.

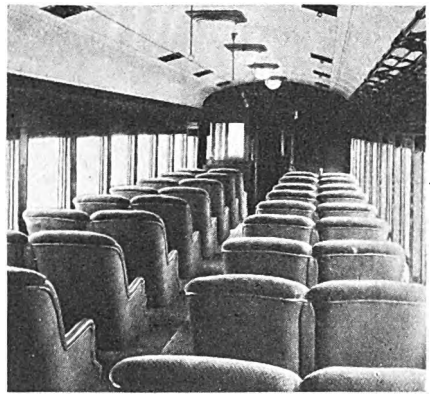
Features which distinguish the latest group of passenger cars from the 25 units put in service by the South Shore Line a few years ago, coincident with the re-electrification of the road, are their greater length and the bucket type of seat used. The new cars are 61 ft. long, 1 ft. longer than the old ones, and are equipped with rotating bucket seats upholstered in gray Byzantine plush, whereas green plush reversible cross seats were installed in the earlier equipment. Another interesting arrangement in the new cars is the Pullman type smoking compartment, which has been made standard for both motors and trailers. The smoking compartments are furnished with facing leather-covered seats for eight passengers. An aisle passes around this compartment, making it unnecessary for passengers entering the cars to pass through the smoke-filled room.

Control apparatus in each car permits multiple-unit operation with either a motor or trail car at the head end of the train. The cars are also equipped with steel and canvas diaphragms, making possible the operation of solid vestibule trains. Steel pilots are at both ends of the cars.

The interior finish of the cars is mahogany with cream-colored ceilings, while the exterior is done in the railroad's standard orange and maroon lacquer. A 32-volt multiple lightng system is used, with a 225-amp.-hr. storage battery automatically charged from a motor-generator set.

The motor car specifications are as follows:

Number of units	10
Type of unit	Two-man, motor, passenger, interurban, double end, double truck
Number of seats	48
Builder of car body	Pullman Car & Mfg. Company, Chicago, Ill.
Weights:	
Car body	63,700 lb.
Trucks	33,200 lb.
Equipment	33,700 lb.
Total	129,600 lb.
Bolster centers	38 ft. 0 in.
Length over all	61 ft. 0 in.
Length over body posts	49 ft. 6⅛ in.
Truck wheelbase	7 ft. 0 in.
Width over all	10 ft. 1⅛ in.
Height, rail to trolley base	13 ft. 1 in.
Date of order	Trucks, Dec. 18, 1926; body, April 18, 1927
Date of delivery	Aug. 8, 1927
Window post spacing	35 in.
Body	All steel
Roof	Arch

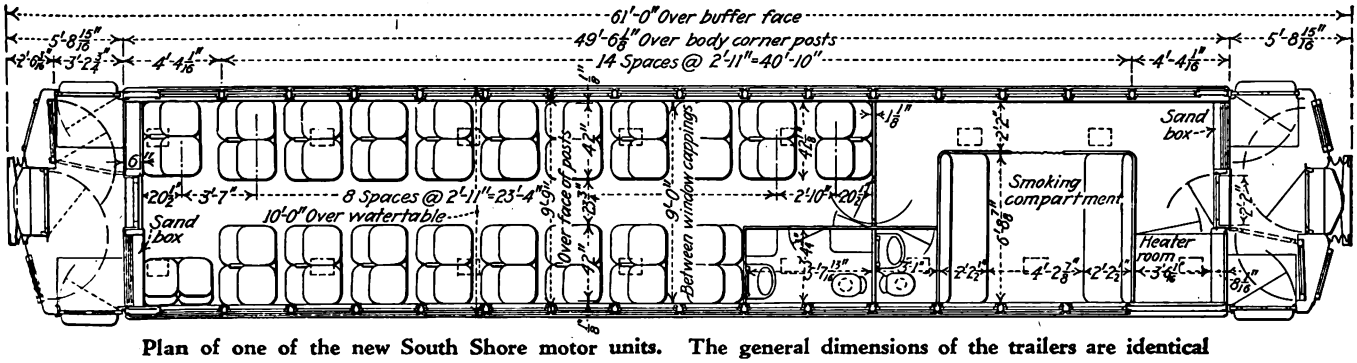


Interior of one of the units showing the rotating, bucket type seats

Doors	End, swinging
Air brakes	Westinghouse AMU
Armature bearings	Plain
Axles	5½x10 in.
Car signal system	Faraday 32-volt, single stroke bell
Compressors	Westinghouse D3F, 1,500-volt
Conduit	Metal
Control	Westinghouse HBF, 1,500-volt
Couplers	Ohio Brass Company
Curtain fixtures	Railway Curtain Company
Curtain material	Pantasote
Destination signs	Hunter
Energy-saving device	Economy meters
Finish	Duco
Floor covering	1¼-in. battleship linoleum
Gears and pinions	Westinghouse BP
Glass	Plate
Hand brakes	Peacock staffless
Heat-insulating material	Balsam Wool
Heaters	Peter Smith, OC2
Headlights	Electric Service Supplies Company 32-volt, 250-watt
Headlining	Steel
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Pullman dome type
Motors	Four Westinghouse No. 567, inside hung
Painting scheme	Orange and maroon
Pantograph	No. 515C Westinghouse
Roof material	Poplar wood and canvas
Safety car devices	"Deadman" feature and controller
Sash fixtures	Adams & Westlake
Seats	Hale & Kilburn No. 900 rotating
Seat spacing	35 in.
Seating material	L. C. Chase Co., Byzantine plush, gray and brown
Slack adjusters	Westinghouse type J
Steps	Stationary
Step treads	Stanwood self-clearing
Trucks	Baldwin Locomotive Works, equalizer type
Ventilators	Railway Utility Company
Wheels	Rolled steel, 36 in. diameter

The ten trailers are identical in design and dimensions with the motor cars. They are fitted with control including full safety equipment the same as on the motor cars. The air brakes are Westinghouse ATU, trailer type. The trailers seat 50 passengers as compared with 48 for the motor cars on account of a slight rearrangement of the toilet. Weights are as follows:

Number of seats	50
Date of delivery	July 26, 1927
Weights:	
Car body	60,000 lb.
Trucks	33,200 lb.
Equipment	3,000 lb.
Total	96,200 lb.



Plan of one of the new South Shore motor units. The general dimensions of the trailers are identical

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$300,000 Railway Order for Japan

Contracts have recently been let by the Tobu Railway of Japan for 28 motor-coach equipments, sixteen trailer-coach equipments and two completely automatic rotary converter substations to supply 1,500 volts direct current for the electrification of the 50-mile stretch of railway from Sugito, on the Asakusa-Kuzuu line, to Nikko. This order, which was awarded to the English Electric Company of London, is valued at approximately $300,000. It is the fourth placed by the Tobu Railway with the same company and is additional to contracts for the supply of twenty motor-coach and fourteen trailer-coach equipments previously awarded by it to this concern.

Metal Markets Dull

Producers of the non-ferrous metals can find little ground for optimism in the market report for the week ended Sept. 27. Sales of all metals have been meager and the prices for all the more important ones are lower.

The excellent buying of last week has been followed by a wave of lassitude, and the tonnage disposed of during the week ended Sept. 27 was one of the smallest of the year. Most sellers feel confident that the present lack of interest is only a passing phase, and have merely quoted 13.25 cents. Certain sellers who pursue the policy of always disposing of their output irrespective of market conditions have made large concessions from this price, and in consequence have practically monopolized the market. To obtain a price of even 13 cents, however, they have been compelled to make a wide canvass of the consumers.

The most that can be said for the lead market is that the American Smelting & Refining Company is holding firm at its contract price of 6.25 cents in spite of a quiet domestic demand and continued reductions abroad, which have brought the London spot price today to £20½, the lowest level reached since March, 1922. The leading producer in the Middle West has gone back to 6 cents St. Louis, which seems to be the deadline for the time being, so far as this seller is concerned.

Less zinc was sold in the week ended Sept. 27 than in any other week since February. On Sept. 28 zinc sold as low as 6.075 cents, though forward deliveries were higher.

Tin has broken through the 60-cent level, and is down to about 58⅝ cents for prompt Straits, forward being about half a cent less.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Sept. 27, 1927
Copper, electrolytic, cents per lb.	12.80
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.25
Zinc, cents per lb.	6.15
Tin, Straits, cents per lb.	58.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	†
Central, Ill., screenings, Chicago, net tons.	†
Kansas screenings. Kansas City, net tons	2.70
†Quotations withdrawn because of strike.	
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$59.0

Twenty Car Sets Sold Sao Paulo Company by Canadian Car & Foundry

The Canadian Car & Foundry Company, Ltd., Montreal, Canada, recently furnished twenty sets of car parts for the twenty new units built by the São Paulo Tramway, Light & Power Company, Ltd., of Brazil. The new units were placed in service on May 5. Their interior finish is of fine quality national wood, highly varnished, which, combined with a creamy white ceiling and a diffusion of illumination with opal reflectors, at all times gives a restful and pleasing atmosphere. The outside color scheme is composed of Tuscan red paneling surmounted by framing finished with cadmium yellow. This gives the cars a bright and attractive appearance.

The units are of the one-man, two-man type and they are adaptable to the pay-enter or pay-leave method of operation. The company built an experimental car before decision was made to construct the twenty units. In outside appearance the cars are very much after the order of the usual type of American units. The seating arrangement is a departure from American practice, however, in that there are two longitudinal seats at either end of the car and facing four crosswise rattan slat seats in each case.

Noiseless Trolley Experiments

Noiseless trolley service is being sought by the Eastern Massachusetts Street Railway. Experiments with noiseless trucks are being conducted on the system by a representative of the J. G. Brill Company of Philadelphia, under an understanding that if satisfactory results are obtained the Eastern Massachusetts will have its cars equipped with new Brill trucks.

ROLLING STOCK

HOLYOKE STREET RAILWAY, Holyoke, Mass., received one Mack city-type bus, gas-electric drive, 196-in. wheelbase, with four-cylinder motor and 25-passenger capacity.

SOUTHERN PACIFIC MOTOR TRANSPORTATION COMPANY, bus-operating subsidiary of the Southern Pacific Railroad, San Francisco, Cal., has accepted delivery on two Mack buses, 230-in. wheelbase, with four-cylinder motors. The buses will operate between Santa Cruz and Boulder Creek, a route 16 miles long, at a 50-cent fare.

BINGHAMTON RAILWAY BUS LINE, INC., subsidiary of the Binghamton Railway, Binghamton, N. Y., has received three 25-passenger Mack city type buses, AB model, 196-in. wheelbase.

SHORE LINE MOTOR COACH COMPANY, subsidiary of the Gary Railways, Gary, Ind., announces the acquisition of a 42-passenger parlor-type twin coach. The unit is a six-cylinder type. It was built by the Frank R. Fageol Company, Oakland, Cal., and will be used in main line service between Chicago and Muskegon, Mich.

TRACK AND LINE

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, Columbus, Ohio, has completed the laying of new track on High Street, between Arcadia and Oakland Park Avenues, a distance of about ¼ mile.

CONNECTICUT COMPANY, Bridgeport, Conn., has been granted permission by the Public Utilities Commission to make changes in its line west of Ash Creek to Library Corner in the town of Fairfield. The company will abandon the present trolley line and give service over the new highway to be known as the Fairfield cut-off. The new route will be considerably shorter, and the company proposes to lay a double track line. The old route was a single-track affair with numerous switches to cause service delays. Public approval has been voiced on the change.

ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY, St. Joseph, Mo., has completed a track job on Alabama Avenue. As soon as this was finished work was started on laying new tracks, steel ties and new concrete between Eighth and Eleventh Streets. Later on the company will rehabilitate its line on Alabama Avenue from Lake Avenue west to the railroad tracks.

READING TRANSIT COMPANY, Reading, Pa., has been busy with a program of track rehabilitation during the spring and summer months which has included relocation and reconstruction of the double track on Aulenbach Cemetery Hill. Another important piece of work under way is the complete rebuilding of the track on North Eleventh Street between Marion and Amity, a distance of about three blocks. The track area is being paved with asphalt on a concrete base, finished off with granite liners. Work on North Eleventh Street will cost about $18,000. In addition the company has done considerable repair work, special work switches, etc., at Sixth and Washington Streets and Third and Chestnut Streets and at Fourth and Centre Avenues. Track joints have been raised along the entire route of the Eleventh Street line, except in the section of new track on Schuylkill Avenue and on Penn Street.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, October 8, 1927 *Number 15*

The Significance of the Cleveland Convention

FROM the moment the exhibits were thrown open in Cleveland, last Saturday at noon, until the final meeting, conference and luncheon was over yesterday, the 46th annual convention of the American Electric Railway Association was permeated with an intangible something that the industry has not experienced in many years. One finds difficulty in naming it. Nevertheless every one in Cleveland was conscious of its presence. Maybe "an air of confidence" would be the proper term to apply. Perhaps "conviction" would be a better word; confidence in the industry's stability and conviction as to the opportunity which lies at hand. Every man who seriously attended the Cleveland convention came away with a better outlook on the industry and on his job.

Cleveland crystallized the thinking which has been developing in the industry for several years. Cleveland furnished concrete evidence of the progress that has been made. Cleveland threw a brilliant spotlight on the future and literally dazzled that vast multitude of transportation men, who came not only from every corner of America but from foreign lands as well, with the vision it revealed of the opportunities that lie ahead. The convention proved that progress is being made, because it showed concrete advance in the exhibits, talked progress in the meetings and testified to progress in the conferences. It opened up a vista of new opportunities of which the industry has for many years scarcely dared to dream. Every one seemed at last definitely to have grasped the idea that the local transportation industry is moving forward and that opportunity lies just ahead for every man who is willing to grasp it. That, in a nutshell, is the significance of Cleveland.

An Exhibit in Superlatives

ANY attempt to characterize and interpret the exhibits at the Cleveland convention leads to the use of superlatives. It was the largest exhibit in terms of the square feet of space sold and the greatest exhibit in the extent of the developments shown. Many delegates declared that it was as much beyond the 1926 Cleveland exhibit as was that great show an advance over the previous year in Atlantic City. In cars and in buses, in track and in overhead line, in electrical equipment and in shop facilities; in fact, in every department of the transportation business new ideas and improved facilities were liberally offered.

Five distinct radical departures from conventional construction of street car trucks were shown by as many different manufacturers. For the first time in more than twenty years there was this direct effort, by fundamental changes from conventional practice in street car trucks, to meet the insistent demand for decreased noise, easier riding and reduced weight. Car bodies showed a similar metamorphosis. The ugly duckling showed great promise of developing into a swan.

The bus gave no indications of standing still. The models shown reflected a better understanding of the automotive vehicle's sphere of operation and of the conditions under which such service can be successfully rendered. There was evidence in the designs offered of a broader understanding of the economic and merchandising aspects of this comparatively new transportation tool. There was evidence of less reliance by the bus designer on the overworked "rubber urge" as the basis for the application of his vehicle. The idea that the bus depends for its future on the decadence and replacement of railways seems to be giving way in favor of the view that the bus has an even greater future through its development as a distinctive transportation agency in its own right.

And so one could go on indefinitely. The track manufacturers are grasping the idea of applying construction production methods to the laying and maintenance of railway track. Overhead line equipment shows progress in the direction of increasing reliability and life and decreasing ultimate rather than first cost. Shop equipment and accessory manufacturers have taken new interest in the development and application of their products to the needs of the local transportation industry. Every manufacturer seems to have grasped with renewed energy his opportunity for helping to sell more and better public transportation miles. With this spirit and this point of view almost anything seems possible.

American Program Reflects Trends of the Industry

PROMINENT among the many innovations of the American Association program at the convention just ended was a series of five-minute talks by executives on a wide range of topics, the underlying theme of which was the explanation of some progressive accomplishment. Subjects all the way from rehabilitating a broken-down electric railway property to prevention of trolley wire breaks were covered. It is only a pity that the time available prevented more talks of this sort, as they carried the conviction of men who have fought their battles and won.

Another feature was the entire absence of formal committee reports. The position was taken by the program committee that these reports have been printed in advance and are available for the entire membership. Usually the time allotted for discussion on the floor of the convention is so short that only an incomplete evaluation of the work of the committee can be made.

The time saved by elimination of committee reports was used to good advantage for the presentation of a number of notable addresses by speakers from outside the industry. It is significant that all of these speakers

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took an optimistic view with respect to the industry and the forward steps it is making along many lines.

It is quite significant that the arguments of a few years ago regarding the place of the bus in the transportation scheme were absent. The bus has been accepted and the affiliated associations are now discussing the exact uses to which it is best adapted, as well as the detail of how best to provide facilities for it and the technique of handling it.

Don't Wait for Costly Money

FINANCE as a subject occupied a large part in the program at Cleveland. It was dealt with by several speakers and was the topic at one of the round-table conferences. There was very little mincing of words about the matter. It is pretty well known where President Stevens stands on the importance of revamping the structures of railway companies. Some of the speakers as well, particularly Mr. Frazer and Mr. Sisson, pointed out specifically what could best be done under certain circumstances to approach the improvement which the committee on finance had in mind when it made its report two years ago.

Advantage has not been taken of the suggestions made by that very able committee after several months of study. This is particularly regrettable because the ensuing period has been one of easy money which may or may not continue. Of course, it is well known that a voluntary readjustment of financial structures is a process not easy of accomplishment. But it is far easier during a period of low money cost than it will be if action is postponed until money rates become higher. The only alternative which any company carrying a topheavy and cumbersome financial structure may hope for is a gradual improvement of its condition through the process of plowing back surplus earnings. That, at best, is a slow method. If earnings are not sufficient to keep the property abreast of developments, then it is best both for security holders and car riders to make a change in structure that will make the company's securities more salable to the public. In view of the present money situation, it seems unwise for many companies to delay changes that ultimately may prove inevitable.

After all, the basis of credit is character. Character in an electric railway means progressiveness of personnel. As Mr. Sisson said, despite the soundness of the railway business from the standpoint of its economic necessity, many properties are hard pressed for credit because of unsatisfactory franchise or contractual relationships and topheavy indebtedness, with its accompanying overload of fixed charges. The relief from improper franchises lies in proper public relations. During the past few years there have been many examples of a complete reversal of franchise conditions through the medium of giving the public a better understanding of the situation as it affects its own interest. Similarly, then, the road to financial improvement lies in the direction of better investor relations. This can be brought about only by a management which adequately appreciates the importance of the financial problem, and undertakes seriously to convince its security holders of the need for readjustment. To come back physically often means to come back first financially. It is impossible to do that unless the railway securities which are offered to the banker, and through him to the public, will stand the closest scrutiny in comparison with those of other industries.

Luncheon Conferences an Innovation

NO CHANGE made in the convention program during recent years has aroused so much enthusiasm as the series of luncheon conferences. Fourteen topics were discussed on three different days and the range of subjects was so wide that there was something of interest for every delegate. In addition to these luncheons sponsored by the American Association, several other groups met similarly to discuss common problems. Such groups were organized by leaders among the affiliated associations and provided the opportunity to consider topics on which information was desired.

Because of the smallness of the groups and the informal nature of the discussion, many members took part who never have been heard on the convention floor. Modest though they were, they all had something to contribute to the discussion. It was quite noticeable that no attempt was made by the speakers to use the time in idle talk, but each one who took part had a real story to tell. In large measure the experiences of the speakers was the subject dwelt on. Often a series of rapid-fire questions brought out details that were needed to amplify the original story until the listeners understood fully the points made. By concentrating on a single subject it was possible to cover it more thoroughly than is usual on the convention floor.

Subjects considered at the meeting were well chosen by the committee in charge. All were well attended, though some were so popular that many were unable to gain admission. The interest, however, was in no way measured by the attendance, as some of the most enthusiastic discussion was evidenced in the smaller groups. In fact, these small groups on account of their size were the least formal, and on that account lent themselves to the most open statements of opinion.

Men Who Reveal the Facts

LIKE the Rosetta Stone which became the key to the long lost tongue of Egypt, so does the accountant, interpreter of countless masses of figures, unlock the secrets that lie buried deep in the intricacies of business routine. That he takes his duties seriously in the railway business was apparent during the meetings of the Accountants' Association at the Cleveland convention. There ran throughout the sessions an underlying note of earnestness, studying and thought given to the problems which arise in the accounting departments.

Even a casual visitor to the sessions of this body would have become quickly aware that these men are not limited in vision by the rules on the stationery they use. Their effort is being spent in reaching out for improved methods of gathering, presenting and standardizing accounts in a way that will facilitate analysis of operating efficiency. They are trying to improve their own performance as real interpreters of the industry.

"Dry as dust" is now a misnomer for figures. Under the skillful hand of the accountant they become deeply interesting and vitally significant. On chart and page, they are made to live, and they tell a vivid story that may be either one of inspiration or of tragedy. The Accountants' Association is making real progress in improving the work of its members. They are coming to be appreciated in a new way throughout the industry—these men of facts.

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The Claims Association Is Making History

"HOW can a claim agent best fit himself for his job, keep his mind fresh and alert; keep up with the times?"

So was the question asked by President Proctor in his annual address. It was answered satisfactorily through the three days of meetings at Cleveland, at the Wednesday Claims lunch and in many groups of claims men—old friends meeting again and joining in helpful discussion of new problems and situations. Traffic regulation, for example, so needed as a means of accident and claim reduction, came in for both formal and informal conferences. It occupied much of the opening day's program and was taken up again to be considered from a different viewpoint at the joint meeting of the Claims and the Transportation and Traffic Associations.

It was felt unanimously that the chaos of conflicting traffic rules in cities and states constitutes a potent breeder of automobile collisions with each other, with pedestrians and with street cars, and from this thought and discussion came definite action—i.e., arrangements for the appointment of a committee to convey to the parent association the feeling of the Claims Association that the Hoover code should be fostered and stimulated so that its traffic control provisions may be incorporated into the laws of every state.

No claims man can fail to be interested in the proceedings of the closing day, with its symposium on claims subjects. It included an account of what happened in Milwaukee, where three Circuit judges sat for many weeks on an inquisition into ambulance chasing by personal injury lawyers and how the city was purged of their pernicious activities; also the last word on special conditions in Montreal, Cincinnati, Pittsburgh and other cities.

There were new faces, and younger men as well as practically all of the "regulars," at the meetings this year. No executive can afford not to have at least one of his claims men at next year's convention.

Engineering Committee Activities Bring Tangible Results

REPORTS presented this year by the various committees of the Engineering Association were notable for the number of definite recommendations contained. In most instances these committees investigated specific subjects and accomplished tangible results. They dug out the facts, examined them carefully, and stated without equivocation the logical conclusions deduced therefrom.

A good example of this method of working is furnished by the report of the committee on light-section rail. Comprehensive data were secured on the use of 7-in. grooved girder rails of various weights. From the figures obtained, it appeared that there was a considerable demand for a 7-in. rail lighter than the A.E.R.A. standard. The committee therefore recommended the adoption of a new standard, and submitted a design for a 7-in. grooved girder rail weighing 103 lb. per yard. The work of this committee was performed with the neatness of a mathematical exercise which begins with a hypothesis and proceeds through the demonstration to a definite conclusion.

Obviously, it is not possible to handle every subject in just this way. In the main, however, the reports made by the engineering committees were presented with commendable brevity and clarity. No one could read them without getting a very clear idea of the problems and the committees' ideas of what to do about them.

Unfortunately, the same cannot be said for the reports of all the other associations. Granting that their problems are not all susceptible of the precise treatment given by the engineers to their problems, there remains, nevertheless, much opportunity for improvement. This can best be accomplished by narrowing the scope of activity of the individual committees and studying specific subjects more intensively.

Increased Speed Is a Vital Necessity

AGREEMENT among members of the Transportation and Traffic Association present at the convention was practically unanimous that increasing the speed of car operation is one of the most important problems before the industry today. Opinions differed, however, as to how this desirable result could best be obtained.

In the discussion revolving around the subject of bus operation, it was pointed out that a combination of buses to handle the local traffic and cars operated on a high-speed express schedule with infrequent stops is a possible solution of the problem. Another method of attaining a somewhat similar result is by the operation of the buses in high-speed de luxe service, while the cars carry the local riding. In Detroit the first mentioned of these plans was said to be working well, while the second has met with marked success in Pittsburgh and elsewhere.

That traffic regulation has an important bearing on the speed of car operation was emphasized at another meeting. It was the general opinion that electric railway managements should take the lead in having transportation surveys made in the cities where they operate. Only after this has been done can effective traffic regulations be formulated. Regulations based on guesswork or simply borrowed from some other city are likely to do more harm than good. It was clearly brought out that the foundation of all effective traffic regulation is exact knowledge concerning traffic flow.

Speed was considered the first and most important element in service betterment by the committee studying this subject. The necessity of improving the character of electric railway rolling stock was by no means overlooked by the members of this committee or the delegates participating in the discussion, but it was felt strongly that faster service is of even more importance than better cars. Several transportation men mentioned the desirability of using street loading platforms. This results in speeding up not only the car service but also the movement of other vehicles. The need for quicker acceleration and braking was brought out, although it was emphasized that this should not be done in such a way as to cause discomfort to passengers.

It was admitted that the average street car today is far behind the times in the matter of speed. On the other hand, it was pointed out by one of the engineers present during this discussion that there is no physical reason why the street car should not be the fastest accelerating and braking vehicle on the streets. Judging by the keen interest displayed in this matter of speed by all members of the T. & T. Association present, the electric car of tomorrow will be a faster as well as a better vehicle than the car of today.

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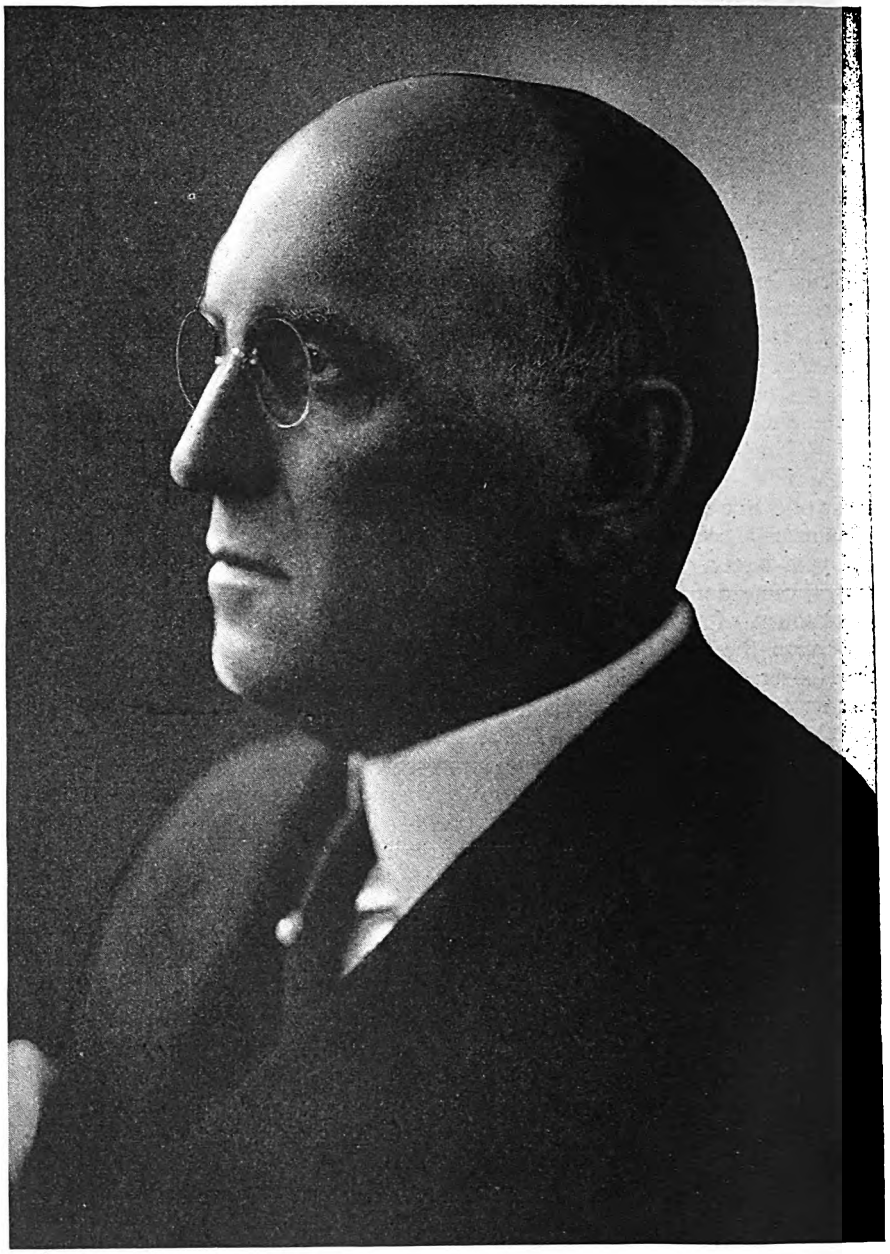
R. P. Stevens

Newly Elected President of A.E.R.A



R. P. STEVENS, president Penn-Ohio Edison Company, was elected president of the American Electric Railway Association Oct. 4.

In Mr. Stevens the industry has a fit leader for its present-day problems and opportunities. The field of his past activities extends from Maine to Washington; the range of his abilities from practical house-wiring to broad-scale interstate development.

As recently as 1926 Mr. Stevens' Pennsylvania-Ohio Electric Company was honored with the Coffin award for most distinguished achievements in the electric railway and motor coach field. De luxe interurban cars and de luxe express coaches have ceased to be a novelty, but when R. P. Stevens put the final financial "O.K." on orders for such equipment some five to six years ago he knew he was taking something more than a sporting chance.

Here was a property of small towns and short interurbans shot to pieces from wartime hangovers and competition, with the management faced by an overwhelming propaganda to tear up the tracks and run on rubber only. But there was no weakening. Instead, there was developed the first real co-ordination of rail and coach. Side by side, the company modernized its railways and installed a higher-rate, special-stop motor coach service. When 1926 rolled around, it had completed the full depreciation on its automotive equipment and could prove that its scheme of unification had made good.

With such pioneering by its own president, the American Electric Railway Association can look forward with confidence to the coming year, with its ever-speeding trend toward finer equipment with higher standards of service for an auto-accustomed public. Having made good on his own property, anything that he has to say before fellow-workers or the general public will be greeted with redoubled respect.

On looking back over the past years, one finds that responsibilities came early to Ray P. Stevens. Born in Eastport, Maine, in 1877, his boyhood and youth knew the training of New England effort and frugality. As he made his way through high school and the University of Maine, he built up a house and hotel wiring business to earn the wherewithal. Even his later work at the Massachusetts Institute of Technology went in tandem with jobs from the Bell Telephone Company and the General Electric Company.

After he built some lighting plants in the South for the General Electric Company, Mr. Stevens found himself at Everett, Wash., at the beginning of the century, where he practically built an entirely new system from power house and track through to cars and general organization. Returning East, he held a number of operating positions until 1907, when he achieved the presidency of the important Lehigh Valley Transit Company at the age of 30. In short order, a deficit was turned into a surplus.

Following six years successful work on what became known as the "Liberty Bell Route" through Mr. Stevens' pioneer work in ride salesmanship, he was called in October, 1913, to the presidency of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, a corporation which has since expanded into a great interstate group of power and transportation interests. With the expansion of these interests, Mr. Stevens found it necessary to make his headquarters in New York. There he also founded the engineering firm of Stevens & Wood.

Throughout the greater part of his career Mr. Stevens has gladly given his time and knowledge to association activities. While in Pennsylvania he was twice elected president of the Pennsylvania Street Railway Association. He is a past-president of the American Electric Railway Transportation and Traffic Association and now he has attained the highest personal honor within the gift of the industry, the presidency of the American Electric Railway Association.

Those who know R. P. Stevens appreciate his genial character as well as his broad views. If a man's character is best displayed among employees rather than equals, that of Mr. Stevens can well stand inspection. Throughout fourteen years on the Youngstown properties, labor relations, particularly in the difficult field of transportation, have been exceptionally harmonious.

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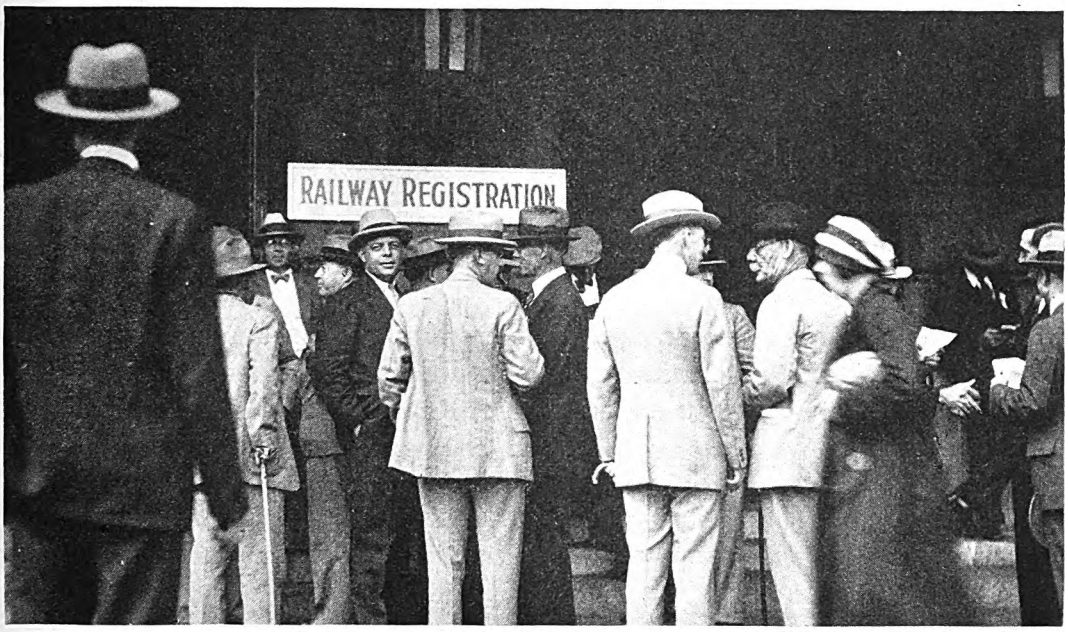
Second Cleveland Convention Eclipses Last Year's

More and better exhibits, improved arrangements, and an augmented program all contribute to the most successful convention in the history of the association



Rush hour at the registration desk

FOR the second time in two years a convention of the American Electric Railway Association has been held at Cleveland, Ohio. This year, the 46th in which a convention of the association has taken place, another record has been made. More railway men registered than last year. Figures for total registration are not available, so it is not possible at this time to say whether the record in this respect will be broken. More exhibit space was used than ever before, and the exhibits were more carefully chosen.

Changes from last year's program were numerous. Committee reports were conspicuous by their absence. None but the essential routine reports were made in the American Association. The Engineering Association, which handles the greatest share of the standardization work, naturally must consider many reports of its technical committees. Even here only one afternoon was devoted to this phase of the work, the meeting being split into parallel sessions that were attended by those who were most vitally interested. The other afternoons were taken up with addresses by men from within or without the industry, who are experts on the subjects they discussed.

For the first time in the history of the association the exhibits were all in place and the doors thrown open Saturday noon, Oct. 1. The registration on Saturday and Sunday showed that many persons took the opportunity of gaining time to inspect the exhibits beforehand rather than waiting until exhibit day, as in past years. Some rearrangements in the booths made access easier, so that there was not the congestion around some of the booths as in past years. Except for a shower on Saturday afternoon the weather was fair throughout the convention, so that many more persons inspected the outdoor car exhibits than saw those on display last year.

An earnest desire on the part of all the officers of the association to hold meetings on time was noticeable throughout. Discussion was limited, so that unless the speaker really had something to say he made way for the next one without waste of time. By this means the sessions were put through on schedule and closed earlier than has been customary.

The formal opening of the convention took place on Monday morning in the Auditorium. The Cleveland Railway Male Chorus and the Pittsburgh Railways Band alternated in providing an excellent musical program. At the appointed time President Willits H. Sawyer introduced City Manager W. R. Hopkins of Cleveland, who welcomed the delegates. Headed by the band, the assemblage marched to the West Wing, where Mr. Hopkins made the formal address of welcome.

President Sawyer talked earnestly to the delegates in his annual address, stressing the opportunity to give service. Following Mr. Sawyer came a succession of

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excellent addresses by men prominent in the business and political worlds. Each left an impression on his hearers.

On Tuesday, Wednesday and Thursday a series of fourteen luncheon round-table conferences was held. The subjects on Tuesday were traffic regulation, taxes, the motor bus, the trend in franchises, developing the sales instinct in platform employees and advertising. On Wednesday, cars, financing, public relations, bringing city service up to date, valuation, fares, and employee relations were the topics. On Thursday there was a single luncheon, devoted to the subject of opportunities and prospects for the interurban.

No program of the association would be complete without an address by E. F. Wickwire. This year his talk sparkled just as much as ever, and he, as in former years, made as many points that drove home.

With all its serious topics the convention was not without its moments in lighter vein. Golf was confined to Sunday. Monday evening the president's reception was held. Tuesday evening's session, sponsored by the Advisory Council, had as its entertainment feature a number of solos by Miss Anna Case, prima donna of the Metropolitan Opera Company. On Wednesday evening one of the local theaters was completely reserved for the delegates and a special show was put on with features for the members. Thursday evening the grand ball was held in the Auditorium.

The Pittsburgh Railways Band gave concerts each afternoon during the convention, and the Cleveland Railway Male Chorus also gave a series of concerts for the delegates. These features added greatly to the success of the convention.

Regulation and Traffic Control Discussed

At Monday's session of the American Association street traffic control and regulation of public utilities were the subjects of addresses by prominent speakers. Revisions of the constitution and by-laws adopted broaden the scope of the association

BRIEF exercises in the Auditorium opened the 46th convention of the American Electric Railway Association at Cleveland on Monday, Oct. 3. A concert was given by the Cleveland Railway Male Chorus and the Pittsburgh Railways Band. President W. H. Sawyer introduced City Manager W. R. Hopkins of Cleveland, who formally opened the sessions. Headed by the band the audience then marched to the meeting room in the West Wing, and the business of the day began.

In his address of welcome Mr. Hopkins paid tribute to John Stanley, late president of the Cleveland Railway, who passed away at the opening of the convention last year. He said that the work of leading and modernizing the Cleveland Railway so ably begun has been carried on successfully by Col. J. H. Alexander. The virility of the transportation industry is shown, he said, by the way it is attacking the problems of the day with energy and intelligence.

The excellent state of the finances of the association was indicated in a brief report by the treasurer, Barron Collier.

The morning was devoted to two addresses. The first by Dr. Miller McClintock, director of the Erskine Bureau for Street Traffic Research of Harvard University, and the second by Hon. W. W. Potter, Attorney-General of Michigan.

Dr. McClintock spoke on street traffic control and electric railway operation, calling attention to a number of the vital points that are essential to betterment of present conditions. It is not possible in the ordinary narrow streets, he said, to give an exclusive right-of-way to street cars. It is, however, within the limits of reason to require vehicles to leave the tracks on the approach of a car so that it can proceed.

Loading zones are essential to safety and dispatch in the handling of street car traffic, he believes, and raised platforms should be installed. Parking should not be eliminated, but it should be controlled. Double-line parking should be prohibited.

The only reason for the use of signals for traffic control, Dr. McClintock believes, is to reduce delays. At least 50 per cent of the automatic signals in use today are worse than useless. The electric railway men should see to it that the installations are made only where they can do some good.

Progressive signaling, where the lights are so changed that vehicles can progress from one end of the control zone to the other without the necessity for a stop, is the best method that has yet been devised. This reduces the unnecessary standing time and speeds all movements.

A telegram of congratulation from President Coolidge was read by the president. This appears elsewhere.

Mr. Potter, speaking on the regulation of public utilities, traced the change from unbridled competition to regulated monopoly, showing the excellent results obtained. The demands of the public have changed, but the railways have not met them, he said. The methods must be modernized accordingly and the rates needed to support them will come, as the public in the long run is appreciative. Payment for paving in the railway area is archaic, he holds. It is unfair, as the community in general is using an investment made by the railway as a result of legislation dating back to the horse car days. The general taxes of the railway are the same as those for other corporations, but the proceeds are often used to provide a right-of-way for a competitor who is attempting to take business away from the railway.

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Important changes in the constitution and by-laws of the association were adopted. In brief, these will broaden the statement of the objects of the association, and will make it possible for the executive committee to admit to membership, with proper restrictions, companies operating any form of urban or interurban transportation. Other changes will provide a class of membership for the various state and sectional associations to form an effective tie with their work, and to provide for plural voting in recognition of the difference in size of the various electric railways. This is particularly important in voting on standards. The schedule of dues was revised so that the finances of the Advisory Council would be consolidated with those of the main association.

American Association Elects Officers

Ray P. Stevens is chosen as president. Association listens on Tuesday to budgets. Conditions in the industry and how the public may be pleased

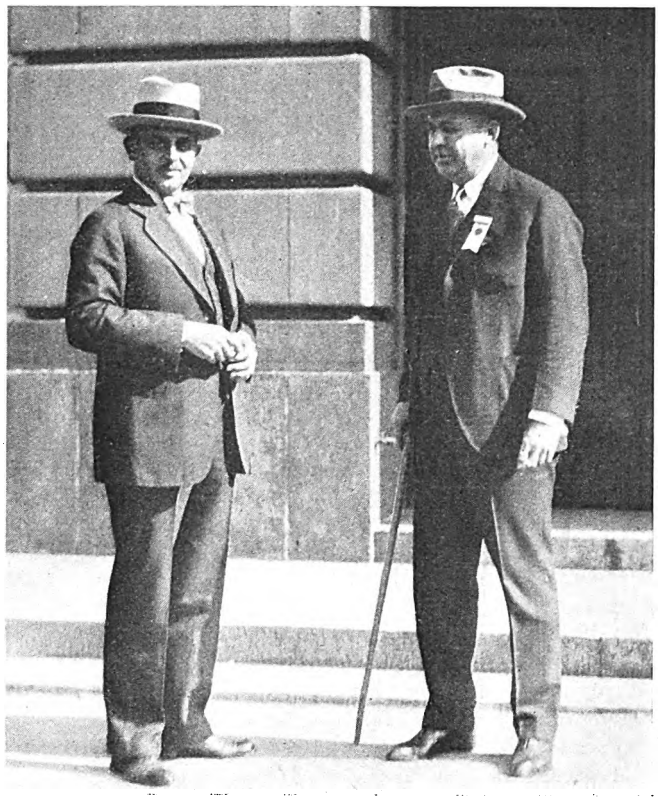
FOUR outstanding addresses featured Tuesday morning's session of the American Association. The subjects were budgeting for the future, improved conditions in the industry, the changing demands of American business, and methods by which the railways may please the public.

Before the first address, Past-President J. N. Shannahan presented the report of the nominating committee. The entire ticket, headed by Ray P. Stevens for president, was elected unanimously.

George E. Fraser of the firm of Fraser & Torbet, certified public accountants, spoke on the ten-year budget. An abstract is published on another page of this issue.

M. H. Aylesworth, president National Broadcasting Company, chose as his subject "Smile and the World Smiles with You—Weep and You Weep Alone." He said that he had originally decided to use as his title "Don't Imitate the Undertaker — He Serves Only the Dead," but that after a survey of the situation he had decided the former title would be more appropriate. He paid tribute to the way the electric railway industry has weathered the storm of the past few years and has profited greatly by the experience. A spirit of optimism and confidence, he said, is necessary if the transportation industry is to convince others it is a public service essential in character.

W. E. Wood



C. R. Ellicott and E. D. Kilburn

Merle Thorpe, editor of the *Nation's Business,* forcefully told the audience of the present orgy of law-making, which is in large measure aimed at American business. Some 92,000 bills were introduced in the last session of Congress, but practically none of the old laws was repealed. The administration of these many laws is burdensome and unduly expensive. One family out of every eleven now is employed in the administration of the laws. It is Mr. Thorpe's opinion that no government can operate a business as efficiently as can a private individual. Business is not a lower type of activity than the professions, said the speaker; it is in itself a profession with just as high standards and ideals. The industrial system of America has created three times the wealth that existed previously.

We still suffer from an old-fashioned idea of a secular order as distinguished from religion, held the Rev. Dr. A. W. Wishart, pastor of the First Baptist Church of Grand Rapids. It is not possible to separate the two, for a civilization or a business or a government cannot be built on falsehood. Men who make products such as those featured in the exhibits shown at this convention cannot do it without having character. He called attention to the beauty of the modern designs, holding that utilities may be pleasing as well as useful. This is a new era. The old era of corruption, political chicanery and trickery is fundamentally wrong and is immoral. Fortunately it is passing. The old way of doing business was secretive, he continued. Now when a good piece of work has been done, instead of keeping it to himself the author can scarcely wait until the next convention to tell about it and so make it useful to others in the industry.

On motion of Mr. Shannahan a vote was passed thanking the speakers for their addresses and the program committee for having secured them.

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Grand Rapids Railway Wins Coffin Award

Small property in city of 160,000 awarded 1927 prize at Advisory Council meeting. B. C. Cobb, chairman, points out industry's pressing needs. Hon. George B. Cortelyou discusses the relation between utilities and government

IN RECOGNITION of accomplishments which have had a widespread influence on the entire industry and have done much to awaken the present almost universal interest in the improvement of electric railway service, the Grand Rapids Railroad Company, Grand Rapids, Mich., was awarded the Charles A. Coffin Medal for 1927. President W. H. Sawyer, chairman of the Coffin Award Committee, who made the presentation during the Advisory Council meeting at the Cleveland convention, read the report of the committee setting forth the accomplishments of this property.

The report itself epitomized these accomplishments. With limited facilities, on its initiative and largely with its own resources, this comparatively small railway property, which was scarcely known outside of its own city a few years ago, undertook to demonstrate to the world the process of popularizing electric railways by the improvement of equipment and service. So radical were its methods, the report points out, that when it filed a brief in the competition two years ago, there was considerable doubt as to the outcome of its experiment. The present awakened interest in the improvement of cars, which has permeated to all the manufacturers and to almost every operating property in the country, received a strong impetus by the pioneering of this comparatively small company.

Its accomplishments were not all in the direction of spectacular innovations and showmanship. Combined with this there was a consistent program of increasing operating efficiency and reducing costs. With no change in the rate of fare, revenues in 1926 showed an increase of 1.04 per cent over 1925, and in 1927, when the average figures for properties of its size showed a heavy decrease, it held its revenue slightly above what it had been in 1926, despite a reduction in the activity of the basic industry in its city. For the year ended May 31, 1927, there was a reduction of 9.88 per cent in operating expenses and an increase of 20.83 per cent in net revenue in comparison with the year 1926. After charging off depreciation amounting to approximately 10 per cent of its gross, there was available after taxes a balance equal to 6.4 per cent of its rate base of $6,000,000. This was an increase for the year ended May 31, 1927, of 41.68 per cent over the corresponding period of 1926. There had likewise been an increase in this figure for 1926 over 1925 of 15.63 per cent.

Twelve Contestants in 1927 Competition

There were twelve contestants for the 1927 award. The committee reported grave difficulty in making a selection because of the excellence of the presentations and felt that each of the briefs was entitled to recognition

B. C. Cobb

by the industry because of the accomplishments shown by these twelve properties—namely, Birmingham Electric Company; Chicago, South Shore & South Bend Railroad; Chicago Surface Lines; Durham Public Service Company; El Paso Electric Company; Georgia Power Company; Grand Rapids Railroad Company; Little Rock Street Railway; Northern Texas Traction Company; Southern Colorado Power Company; United Railways of St. Louis, and Virginia Electric & Power Company. Of these contestants the Northern Texas Traction Company won the award in 1924 and has continued to be a contender each year, having submitted this year its fifth consecutive brief. Two other of the above companies submitted briefs in previous years, Grand Rapids in 1925 and El Paso in 1923, 1925 and 1926.

Several of the contestants showed evidence of major accomplishments which were considered by the committee to be ample basis for granting them the award had not the prize been so closely contested by the presentation of impressive accomplishments on the part of a number of other properties.

Gross and net revenues were increased by the Birmingham Electric Company, which also effected substantial operating economies and increased riding on its cars by rerouting, new cars and frank publicity.

The Chicago, South Shore & South Bend Railroad doubled its earnings in a period of two years by a program of complete rehabilitation and by the provision of comfortable and luxurious cars designed to win the patronage of former automobile drivers. By arranging to operate its cars over the electrified tracks of the Illinois Central Railroad, an entrance to the heart of downtown Chicago was obtained, thus increasing the usefulness of the road to the territory which it serves.

Despite increased ownership of automobiles in Chicago, the Chicago Surface Lines increased its rides per capita by the improvement of service. Gross earnings were increased and greater operating efficiency was obtained by a determined program of improvement undertaken in the shadow of a receivership and in the face of an expiring franchise. Participation by the railway management in the program of reducing traffic congestion

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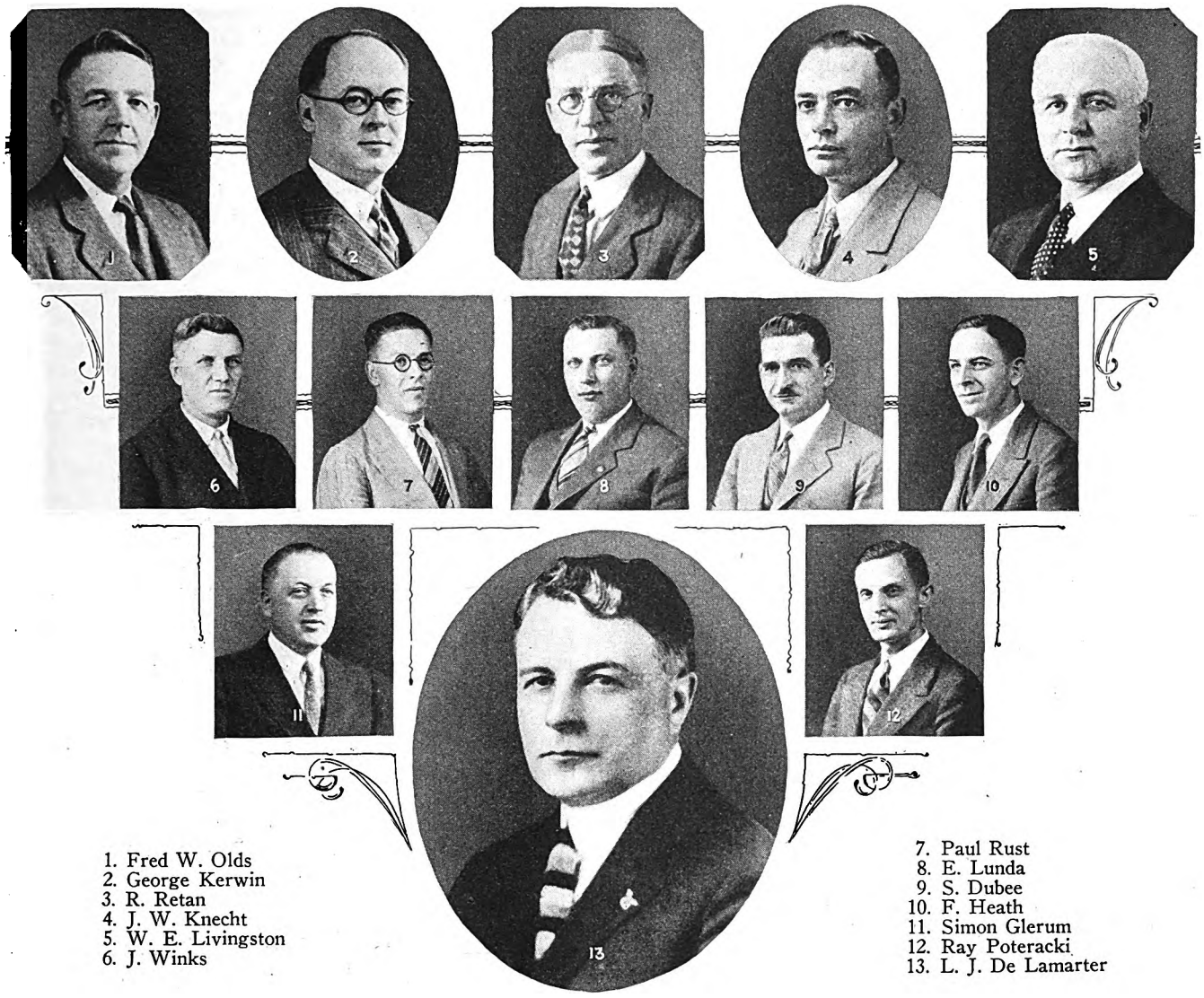

1. Fred W. Olds
2. George Kerwin
3. R. Retan
4. J. W. Knecht
5. W. E. Livingston
6. J. Winks
7. Paul Rust
8. E. Lunda
9. S. Dubee
10. F. Heath
11. Simon Glerum
12. Ray Poteracki
13. L. J. De Lamarter

Officers and key men on prize-winning property

in the downtown district, combined with demonstrated public interest and leadership, won for it the co-operation of its community in bringing about traffic improvement. A major rerouting plan was put into effect without a serious hitch, and resulted in material speeding up of service with important operating economies. A record for efficiency was made during the Christmas holidays, by the operation of 100 per cent of all its equipment.

Continuation of a major program of rehabilitation and improvement over a number of years in the face of losses in revenue and despite those losses finally brought an upturn in the revenue curve for the Georgia Power Company. This improvement program was maintained in the face of a discouraging showing in pursuance of a policy of winning public recognition and support by the sheer weight of performance and demonstrated good faith. This property also succeeded in putting 100 per cent of its equipment in service during the holiday period.

The Little Rock Street Railway equipped its property with new and attractive cars and buses. It showed a reduction in the number and cost of accidents accompanying a change to one-man operation. One hundred per cent of the company's employees are owners of its stock.

Both gross and net revenue were increased by the Northern Texas Traction Company through the modernization of car equipment and the adoption of a scientific fare schedule.

Scientific co-ordination of street-car and bus service by the Durham Public Service Company resulted in a steady and large increase in gross and net revenue. The property shows a remarkably low record of accident costs.

The El Paso Electric Company shows increased average speeds and increased earnings with a steady betterment in its accident record.

The Southern Colorado Power Company rehabilitated its cars, increased operating speed, improved its operating and maintenance methods and succeeded in selling its securities to a large number of local stockholders.

Accomplishments by the United Railways of St. Louis, a company in receivership, include an increase in the number of passengers and in gross earnings, together with a decrease in the deficit after depreciation, taxes and interest charges. Speed was increased and improvement in power and distribution efficiency was shown by the use of a large proportion of automatic and portable substations. Accidents also showed a large decrease.

In the period of only slightly more than a year the Virginia Electric & Power Company completely reversed the opinion and attitude toward the company of the public in the communities it serves. New franchises were obtained, bus and car service was co-ordinated, large increases were made in gross and net revenue and the railway department was put on a self-supporting basis. A heavy program of rehabilitation was undertaken, exten-

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sive rerouting was carried out and new fare schedules put into effect.

One of the features of the evening meeting of the Advisory Council was the annual report by B. C. Cobb, its chairman, which is abstracted elsewhere in this issue. He expressed conservative optimism regarding the outlook for the industry, pointing out that there has been no appreciable change in the number of passengers carried by electric railways and their allied motor bus lines during the past three years. The figure has remained almost stationary at sixteen billion passengers despite rapid increases in the number of automobiles owned.

Still another outstanding feature of the Advisory Council program was an address by George B. Cortelyou, chairman of the Joint Committee of National Utility Associations. Mr. Cortelyou's address is also abstracted elsewhere in this issue. Representing as it does the gas, electric and local transportation industries of the country, this committee speaks as the representative of an investment of capital approximating seventeen billion five hundred million dollars. To illustrate further the extent of the utility enterprises in this country and the widespread public interest which they represent, the speaker pointed out that the savings of approximately 5,000,000 people are represented by the investment in the utilities. He voiced the creed of this vast industry in the words, "We do not consider our job measurably complete until the public is well satisfied because well served."

An Experience Meeting of Operators Held

In five-minute talks prominent electric railway men tell how they are solving their problems. Addresses are presented on finance and progressive methods

FOLLOWING out the general plan of devoting the meetings to formal papers, the greater portion of Thursday morning's session was taken up with addresses by E. F. Wickwire, vice-president Ohio Brass Company, and F. H. Sisson, vice-president Guaranty Trust Company. Mr. Wickwire gave one of his inimitable talks.

Mr. Sisson spoke on the financial situation. The present situation is more reassuring, he said. The public education campaigns are admirable and are producing results and the industry is becoming stabilized.

A feature of the session was a series of five-minute talks on operating problems. The first was by J. L. Alexander, Galveston-Houston Electric Company, who told of the methods used to inspire his men to greater efficiency and loyalty. In order to get the ideas over, the employees have been organized into classes.

R. H. Pinkley, Milwaukee Electric Railway & Light Company, said the methods used to meet the transportation requirements in Milwaukee include improvements in service, higher schedule speeds, and keeping the cars on schedule. Buses are used for special service, and are co-ordinated with the cars.

C. H. Jones, Chicago, South Shore & South Bend Railroad, gave some of the details of how he has developed a 300 per cent increase in business. The property was run down and about ready for the undertaker when it was taken over. The new owners had faith in the electric railway business and so were willing to incur the expense necessary for rehabilitation. Several things in particular have been done that have improved conditions: (1) An adequate entrance into the heart of Chicago was obtained; (2) at first the company furnished service far in excess of the requirements; (3) the best possible use was made of a parallel motor coach line; (4) a campaign for freight business was begun, both carload and less-than-carload shipments being solicited; (5) a new business department was formed to solicit passenger traffic; (6) a recreation bureau learns of the attractions of the territory served and sells the idea to the general public. There is only a small amount of attention paid to solicitation of passengers, as it is felt that if the territory is built up the riders will come to the line naturally.

There has been an increase in passenger revenue during the first part of this year of 175 per cent over 1926, while the maximum increase in one month was 200 per cent. The freight business is running at the rate of 150 per cent over 1926, while the maximum month shows a 175 per cent gain. This is a testimonial, he said, that the public wants good transportation service.

R. P. Stevens

Col. H. W. Alden, Timken-Detroit Axle Company, spoke of the policy of his company regarding experimental work in connection with street car drives. The type of drive that was chosen, he said, was one that had shown itself to have the longest life.

D. W. Pontius, Pacific Electric Railway, mentioned the loss of passenger traffic due to automobile competition. Though there has been a considerable increase in population in the territory served by his lines, there has been little growth in the passenger business. The freight business is growing at a rapid pace, he said, and the Pacific Electric Railway is now the third largest freight carrier in California, being exceeded only by two steam railroads.

The electric railways in his territory are modernizing and going after business, he said. He outlined the improvements being made in Los Angeles. Lines are being double tracked where needed, and other means are being used to increase the capacity.

A. F. Townsend, Northern Texas Traction Company, Fort Worth, attributed the success in his city largely to the substitution of light-weight Birney cars operated by one man, for heavy two-man cars. Schedule speeds also were increased. In 1914 the operating costs were 15 cents per car-mile, and by 1920 they had jumped to 25

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cents. Introduction of the new cars caused a recession to 16 cents per car-mile in 1926, though the trainmen's wages are increased 180 per cent over what they were in 1914.

H. T. Connelly, Washington, Baltimore & Annapolis Electric Railroad, told of automobile and bus competition along the 40-mile route between the terminal cities. To meet this the old two car trains have been replaced by modern articulated cars, saving 44,000 lb. in weight, and one man out of the three formerly needed. While the cars have not been in service long enough to get comparable figures, there has been a gain in traffic since their introduction.

Adrian Hughes, Jr., United Railways & Electric Company, Baltimore, said that there has been a reduction in trolley wire breaks from more than 100 per month to one in 50 days. This has been accomplished with a reduction in cost of the line department from $100,000 a year to $60,000 a year. The change in method was introduced in December, 1920. Previously the line crew waited until a failure occurred; now by careful inspection failures are anticipated. There also has been an improvement in material used, it being appreciated that the best is the cheapest in the long run.

The *Electric Traction* speed trophy, awarded to the Chicago, North Shore & Milwaukee Railroad, was accepted by General Manager Harley A. Johnson, who told of the methods adopted for increasing the schedule speed without raising the maximum speed.

Installation of the new officers was the closing formality of the convention, following the report of the resolutions committee.

Discussions at the Lunch Table

Specific topics considered at fourteen round-table conferences prove of interest to many of the delegates

A SERIES of round-table luncheons was a feature of the Cleveland convention. Fourteen were held under the auspices of the American Association in addition to the several luncheons conducted at the noon hour by the several affiliated associations. Of the American Association luncheons, six were held on Tuesday, seven on Wednesday, one on Thursday and one on Friday. A brief account of those held on the first three days follows:

No. 1 was devoted to traffic regulation.

It was brought out that there is a marked tendency to install traffic control lights without regard for the conditions under which they are to operate. The bad results of this practice in various cities were mentionad by a number of speakers. Others emphasized the importance of railways assuming leadership in solving traffic problems.

Taxes were considered at luncheon No. 2. Most of the information developed at the meeting related to the taxing practice of different states on public utility properties, particularly electric railways. While no attempt was made to obtain any general consensus of opinion, the thought was expressed by several of the speakers that a gross or gross-net tax was simpler to determine and had the advantage usually of requiring a smaller number of tax boards.

Luncheon No. 3 was on the motor bus and was largely an experience meeting in which representatives from Louisville, Youngstown, Los Angeles and other cities gave their experiences.

The subject discussed at luncheon No. 4 was trend in franchises. One company said its difficulties on a new franchise were solved when it induced a group of representative citizens to investigate its situation and make recommendations.

At luncheon No. 5, on developing sales instinct in platform employees, the possibilities in this direction were brought out by the experience of several companies.

Luncheon No. 6, on advertising, was attended by more than 100 delegates and there was an exchange of ideas on the best means of selling car and bus rides.

The popularity of the round-table luncheons at the Cleveland convention assures their retention as a feature next year. On Wednesday the American Association held six more of these informal meetings at which delegates were able to exchange experiences without loss of time. So many registrations were received for some of these luncheons that two rooms instead of one had to be engaged. When the discussion took place, however, all of the diners came together in one room.

This was the case with lunchean No. 7, on the subject of cars. In it the actual experience testimony of men who have carried out car improvement programs piled up convincing evidence of the growing acceptance by the industry of the importance of improved cars as the key stone of the entire service improvement program for electric railways. Several examples were cited of properties which had first started on a small scale with the remodeling of older equipment and had gradually expanded its program to the purchase of new cars of the most modern types available. Representatives of several large properties at the luncheon said that they were only awaiting demonstration of the proper types of equipment to be used before entering upon extensive replacement programs. There seemed to be no question in any one's mind but that the present car exhibit had demonstrated in no uncertain way the possibilities in developing cars that can compete successfully with the private automobile under modern traffic conditions.

Methods of new financing and refinancing of electric railway properties was the subject of luncheon No. 8. It was presided over by President-Elect Stevens. He opened the meeting by calling attention to the report of the advisory committee on electric railway finance, presented to the association in 1925. In this report it was recommended that where necessary to revise the financial structure, arrangements should be made to do it voluntarily without the necessity for a receivership. There are some properties, he explained, that cannot be made successful. The sooner this is admitted and they are eliminated, the better the general railway situation will be. L. S. Storrs pointed out that the better the earnings the lower the interest rate that can be obtained. Some question was raised as to why the senior security holders should be made to suffer rather than the junior. It was brought out that the junior holders will suffer in any event where a reorganization of the capital structure is necessary.

"Get your house in order," "sell your employees before you try to sell your public"—such were the rallying cries of the public relations luncheon (No. 9). Thomas Fitzgerald of Pittsburgh in opening this discussion mentioned briefly the policy of his company not to punish employees and not to allow any hint of compulsion to

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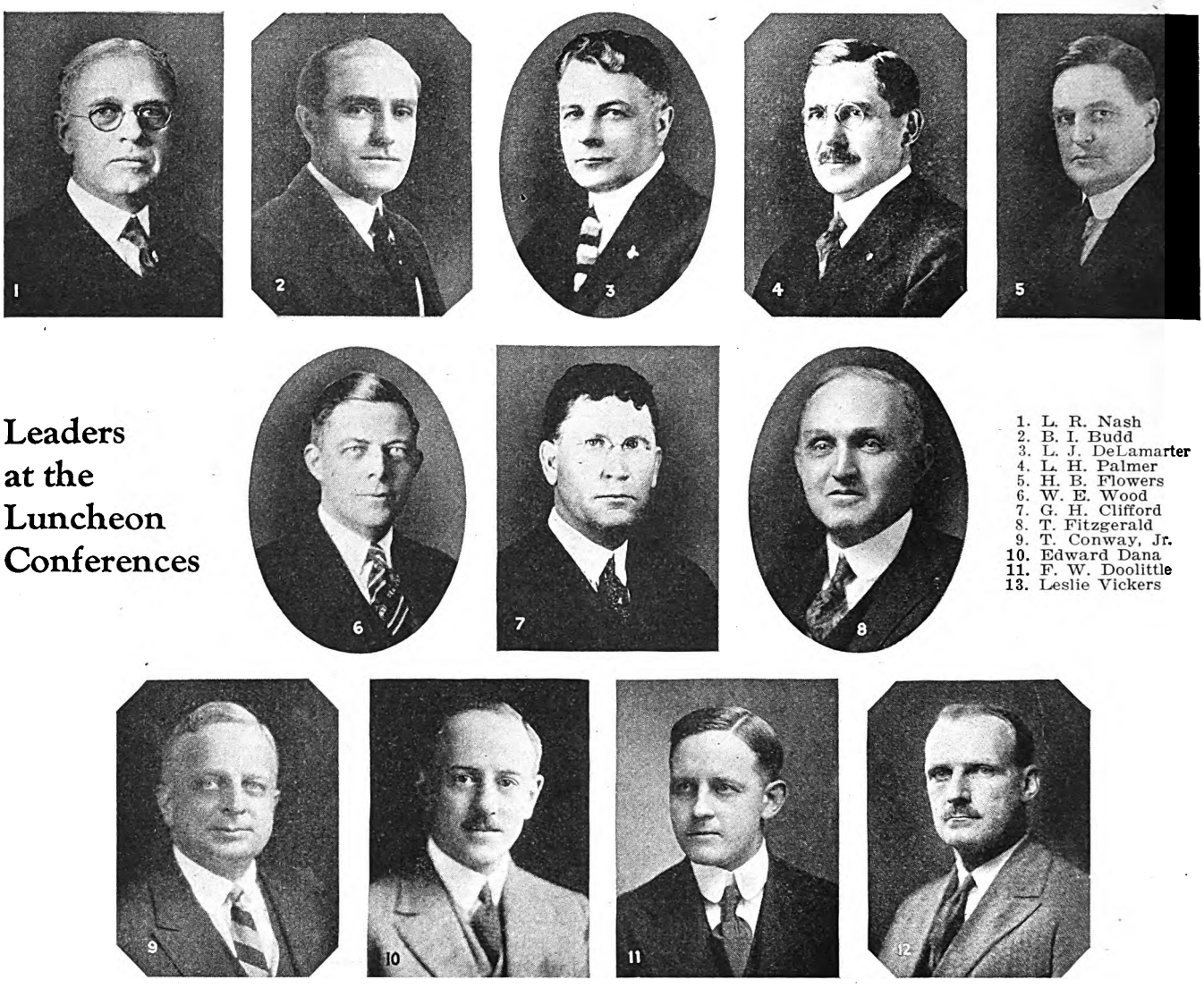

Leaders at the Luncheon Conferences

1. L. R. Nash
2. B. I. Budd
3. L. J. DeLamarter
4. L. H. Palmer
5. H. B. Flowers
6. W. E. Wood
7. G. H. Clifford
8. T. Fitzgerald
9. T. Conway, Jr.
10. Edward Dana
11. F. W. Doolittle
13. Leslie Vickers

enter the company's dealings with the public. Careful employee education and a fair attitude toward the city and the riding public are held by him to be more effective policies than would be heavy-handed methods. R. B. Stearns of Boston outlined briefly the "home rule committee" plan which the Eastern Massachusetts street railway evolved for improving public relations in the various communities which it serves. Fred Cummings of the same company expressed the belief that every company should have a good newspaper man in charge of its public relations, a man with courage enough to stand up to the railway executives and tell them when he believes their attitude to be wrong, even at the risk of sacrificing his own head. John Davies of Philadelphia spoke of the comprehensive plan of employee-employer co-operation which has been worked out in Philadelphia, resulting in a company sales force numbering 12,000 enthusiastic individuals. Adrian Hughes, Jr., of Baltimore mentioned the fact that his company has one employee for every 200 citizens in Baltimore, the obvious inference being that when each employee takes upon himself a responsibility for the company's public relations splendid city-wide coverage results. Other speakers told of good results in Houston and Fort Worth, Tex. The problem of interurban public relations was discussed by Mr. Allenson. He described the experience of his own company with the interurban line between Fort Worth and Dallas and pointed out that first-class equipment and service will do more for good public relations than anything else within the power of the company to accomplish.

More than 100 attended luncheon No. 10, on city service, many telling how the replacement of old cars with new or modernized cars, increased speed and additional comforts had resulted in increased patronage and greater friendship for the utility on the part of the public. In Chicago improved service has been obtained in speeding up street cars by co-operation with municipal authorities and other affected interests through a successful plan for street traffic control. This has enabled the speed of the street cars in Chicago to be increased to an average of 11.02 m.p.h. Other experiences along somewhat similar lines from Atlanta, Detroit, Kansas City and St. Louis were cited.

At the valuation luncheon, No. 11, the discussion centered particularly on the fundamental difference between historical value and cost of reproduction value. One of the intangibles that seemed to bother all representatives present was going value. Courts have ruled that some allowance must be made for this, but no rules for arriving at it have been given. The problems of each utility seemed to require separate solution so that a method used on one property is not applicable to another.

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At luncheon No. 12 it was declared that the trend of fares was still upward despite the difficulty in securing increases, the dangers of making fares too high and the effect of changing fare rates on public opinion. Many interesting facts on various types of fare were mentioned, and means of attracting off-peak traffic at reduced rates and educating the public as to the need of higher fares with better service received considerable attention.

Luncheon No. 13 was devoted to employee relations, and accounts were given of the practice in discipline, pensions, benefit associations, etc. It developed that the benefit association in Milwaukee, composed of more than 6,000 employees, handles its own life, health and accident insurance, operates a building, savings and loan association and handles matters of safety, service and every other feature affecting its membership. The association also has more than $500,000 invested in good securities, and its members have more than $9,000,000 invested in their own building and loan stock. Through this association 3,500 employees have been able to purchase or build their own homes.

Under the sponsorship of Dr. Thomas Conway, Jr., president of the Cincinnati, Hamilton & Dayton Railway, the luncheon meeting on Thursday, devoted to the general subject of interurban railways, provoked a spirited discussion of many phases of the intercity problem. B. J. Fallon, speaking for the group of Insull owned high-speed electric lines radiating out of Chicago, declared that the large increase in the travel habit between cities offers interurbans a greater prospect for business, provided that the proper kind of service and selling initiative can be developed. As an example he cited the experience of the Chicago, South Shore & South Bend Railroad, which has shown an increase of 150 per cent in its business following an extensive program of rehabilitation and intensive merchandising.

D. W. Pontius said that the Pacific Electric Railway is about to spend more than $1,000,000 for improved seats and better facilities for its passengers in the effort to compete more successfully with the privately owned automobile. W. H. Burke testified to the effectiveness of higher speeds and remodeled cars by citing the experience of the Galveston-Houston Electric Company in successfully competing for business.

Freight revenue was held by many of the executives present to afford opportunity for the development of additional business. Freight earnings by the Interstate Public Service Company, according to L. M. Brown, have more than offset the decrease experienced in passenger business. H. A. Nicholl expressed the opinion, based on the experience of the Union Traction Company of Indiana, that interurbans must ultimately go to pick up and delivery of freight in one form or another to meet truck competition. J. M. Bamberger announced that the Bamberger Electric Railway had just started a pick up and delivery service at each end of its line, at regular trucking rates in that territory. He considered delivery of even more importance than pick up in the eyes of shippers.

A discussion of the proper type and size of passenger equipment for interurban service led to differences of opinion which occupied attention during the balance of the meeting. This discussion revolved around the relative advantages and safety of heavy and light equipment in high speed service. Dr. Conway summarized the situation by suggesting that interurban equipment divides itself into various classes depending upon the nature and characteristics of the line and service.

In addition to these luncheons, similar gatherings were held by the Accountants, Claims and Engineering Associations on Wednesday. References to them will be found on other pages of this issue.

Maintenance in the Limelight at Cleveland

Journal prizes awarded at dinner during convention. Prominent executives emphasize importance of maintenance men's part in popularizing electric railway service

W. T. Rossell
Who spoke at the Maintenance Dinner in Cleveland on Oct. 2

"SPEED, convenience, comfort, safety, economy—these are what the times demand. No inconsiderable part in the achievement of these things rests upon the maintenance man. He finds himself always between two opposing forces, improvement and economy. One without the other is easy; together, they test him. The balance that creates the greatest use is the end sought."

With these words, W. T. Rossell, general manager Pittsburgh Railways, characterized the problem of the maintenance man at a dinner held at the Hollenden Hotel on the evening of Oct. 2, when the four annual prizes awarded in the ELECTRIC RAILWAY JOURNAL's maintenance contest were presented to the winners.

Three of these winners were able to be present. They were James A. Duffy, superintendent of equipment Monongahela West Penn Public Service Company, who received the first prize of $200; Joseph Mercier, general foreman track service division, Montreal Tramways, who received the second prize of $100, and E. M. Miley, estimating engineer Chicago Surface Lines, who received the fourth prize of $25. The winner of the third prize, $50, Charles Hermes, general foreman San Diego Electric Railway, was not able to be present, but the prize and a certificate of award were handed later to representatives of his company who were at the convention, for transmission to Mr. Hermes.

100 MEN INTERESTED IN MAINTENANCE PRESENT

Besides the prize winners and judges in the contest, those in attendance at the dinner included about 100 other representative delegates to the convention who are especially interested in maintenance problems. Those at the head table, besides Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL, who acted as the chairman, were President W. H. Sawyer and Managing Director L. S. Storrs of the American Electric Railway Association; Daniel Durie and R. H. Dalgleish, the retiring president and the incoming president of the Engineering Association; W. H. McAloney, president Association of Equipment Men, Southern Properties; P. V. C. See, past-president Central Electric Railway Master Me-

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A Message to the Association

THE WHITE HOUSE
WASHINGTON, D. C., SEPT. 30, 1927

WILLITS H. SAWYER,
American Electric Railway Association,
Cleveland, Ohio.

I hope your convention will be most successful in furthering the cause of transportation so vital to the welfare of our people. Any progress in solving the real problems presented by modern conditions is a service to all. Please present my greetings and best wishes to your members and your guests.

Calvin Coolidge.

chanics Association; W. T. Rossell, general manager Pittsburgh Railways; A. T. Clark, superintendent of rolling stock and shops United Railways & Electric Company, Baltimore, and chairman of the committee of judges in the contest. The other members of the committee of judges, F. McVittie, electrical engineer New York State Railways; Howard H. George, assistant to chief engineer Public Service Production Company, and G. C. Hecker, special engineer American Electric Railway Association, were present as were also prominent railway and manufacturing executives.

The prizes were presented individually by Mr. Clark, chairman of the committee of judges, who declared that the purpose of the contest was to bring about a greater interchange of ideas between maintenance men and thus to raise the level of maintenance practice in the industry. In referring to these contests, he said:

"Since the men who are responsible for keeping cars, tracks and lines in efficient operating condition are inclined to be overmodest and reticent in taking the initiative toward publishing the improvements which they have found effective in saving labor or cost, this plan of posting prizes for such items was a very desirable and helpful one. The unusual publicity given to those items which were awarded prizes should also tend to break down the tendency on the part of maintenance men not to utilize in their own work an idea developed by the fellow on another property. In at least one instance a maintenance idea which was awarded one of the monthly prizes was quickly adopted by a large truck manufacturer and made a part of his standard equipment."

Mr. Clark explained that the members of the committee of Judges had been appointed by President Durie of the Engineering Association to represent different departments of maintenance work. He also explained the care used by the judges in naming the prize winners. In conclusion, he said:

"The board of judges desires to commend the action of the ELECTRIC RAILWAY JOURNAL for establishing these interesting contests. It is their belief that excellent benefit to the electric railway industry will result from the broadcasting through the railways of these various items and will stimulate those who would ordinarily give little thought to publishing their wrinkles to produce items of even greater benefit and more use to the many interested in electric railway companies."

Mr. Gordon, acting as chairman, pointed out that while the purpose of the meeting primarily was to award the prizes, the JOURNAL hoped thereby also to inspire in the maintenance men of the industry a broader vision of the part they play in popularizing electric railway service, to stimulate more interest in maintenance on the part of the railway executives and to encourage further developments of equipment and machinery through the introduction of these new devices to the manufacturers.

PROMINENT EXECUTIVES SPEAK

The railway executives who spoke at the dinner included Messrs. Sawyers, Storrs, Rossell, McAloney and See. All emphasized, though from different angles, the important part played by the maintenance man in popularizing electric railway service. Mr. McAloney said: "The street car is the show window of the industry, and unless the car is well maintained, clean, attractively painted and mechanically capable of operating with a minimum of failures, all the other efforts to popularize the service will fail."

Mr. Rossell, in addition to the remarks contained in the first paragraph of this article, said, in part:

"To me the significance of this maintenance contest is not the mere improvement in method in connection with a few operations. It is far deeper than that. It shows the alertness of mind, the enthusiasm and adaptability of the individuals. Formerly an attitude of mind seemed to exist based on the axiom, 'Never explain anything, your friends don't need it and your enemies won't believe it.' This attitude is breaking down. Everywhere men are traveling about to find out what others are doing. Everywhere men are explaining and showing their most cherished plans and methods. There is no property on which the visitor cannot learn something worth while. The harvest is waiting for the sickle."

Clarence W. Squier of the ELECTRIC RAILWAY JOURNAL staff, also spoke and showed slides of the apparatus which won the prizes. He explained the purpose and advantage of these devices. He also showed slides of other equipment entered in the annual and monthly maintenance contests.

Educational Conference Held Friday

THE final event on the program of the Cleveland convention was the educational luncheon and conference, held Friday at the Hollenden Hotel. Edward Dana, Boston, chairman of the American committee on education, was sponsor for the conference, and it was held under the leadership of Arthur J. Rowland, Milwaukee.

The principal subject discussed was systems for training platform men and bus operators. Experience quoted at the meeting was that following an extended course of this kind on one road, there had been a 70 per cent reduction in accidents, 10 per cent in labor turnover and 20 per cent in claims cases. The course is divided into three general divisions, i.e.: (1) The school training, (2) road training and (3) instruction in equipment details.

It was found that all the roads represented at the conference give special attention to the instruction of one-man operators, and they considered that freight operation adds many problems to the operating course.

The difficulty of modernizing the ideas of some of the older employees was mentioned as a considerable problem by some of those present. Many excellent methods used to select members of the supervisory force were also brought out at the meeting.

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Improved Methods and Equipment Needed, Say Engineers

Ways of producing economical maintenance discussed. Power economies result from use of automatic substations. Motor coach design an added problem. Commercial aviation a new field. Committee reports show progress made

ECONOMY was the general subject of papers and discussions at the first day's session of the Engineering Association. That these problems are receiving much attention was evident. The general impression given was that improved methods and better equipment provide the surest road to ultimate maintenance economies and that although costs at the start may appear high, the ultimate results are the important ones to be considered. Improvements to railway cars, trucks, overhead and power supply are entirely up to the engineers and maintenance forces. That these problems are receiving much attention was evident.

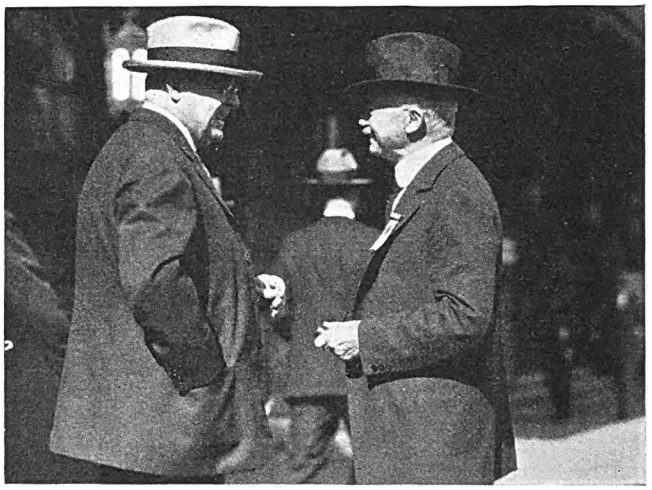
In his address as retiring president of the Engineering Association, Daniel Durie stated that many changes have taken place in our industry during the past decade. Car design, weight reduction, one-man operation, higher accelerating and braking rates, higher speeds, reduction of noise, improved appearance of car bodies, scientific lighting and increased comforts and conveniences for passengers are among the important developments.

In the power field, the automatic substation is a development which has influenced greatly the design and operation of substations. Now comes the mercury arc rectifier, which may have a marked influence on present practices in power conversion and distribution.

All of you are familiar with the developments that have taken place in the construction and maintenance of tracks. The use of labor-saving machinery and modern methods of track construction and maintenance, together with the application of welding to rail joints, has wrought great changes in this branch of our work.

The motor bus brings an entirely new set of engineering problems to be solved, and aërial transportation is being talked of. Perhaps our next set of problems will come in connection with the design, operation and maintenance of airplanes. The significant aspect of all these developments is the changed status of the electric railway business. The obligation to furnish any and all kinds of public transportation in our communities falls squarely upon the shoulders of the established transportation industry. This was held to broaden the field of activity for the electric railway engineer, and to open up greater opportunities ahead for those who can measure up to the job.

The association has been active through its committees and its staff at headquarters in gathering and disseminating information, in establishing good practices and in developing standards for use by the industry. Research work in several fields has been carried on under committee supervision to develop data for the advance of the art and to effect economies. The association is the agency through which the industry expresses its views and safeguards its interests in national standardization and in joint studies and investigations with other national groups.



J. G. Barry and W. B. Potter

The activities of the association have been expanding due to changed conditions and to the impetus given to national standardization and simplification through the work of the American Engineering Standards Committee and the Division of Simplified Practice of the Department of Commerce. This has necessitated a complete change of the association's committee structure in order that more men might be enlisted in the study of the ever-increasing engineering problems and in the development of improved practices and better standards. The new committee system will be completed during the next year. It appears to possess many advantages over the old system, but the executive committee is not yet entirely satisfied with the results and is striving constantly to improve the plan.

In recent years there has been too little time for the presentation and discussion of committee reports and there has been no time at all for papers and discussions of general interest. A new plan is being tried this year which the officers believe will greatly enhance the value of the meetings. This plan provides for group meetings to be held simultaneously, one for the rolling stock division, one for the way and structures division, one for the power division and one for the purchases and stores division. All committee reports will be presented and discussed at those group meetings and all necessary committee business transacted.

Another matter to which the executive committee has given considerable thought is that of promoting wider

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use of the association's standards and recommendations. Obviously the maximum benefits and economies of standardization can be realized only when such standards become generally accepted. Some of our present standards are quite widely accepted today. Others, however, are not used very extensively and the executive committee is seeking the reason for this in the hope that our entire program of standardization can be made of greater value to the industry. Committee members can help in this problem by using our standards and recommendations and by urging others to use them.

Track, Cars and Power

A paper on each of these subjects was presented at the Monday afternoon session

IN A paper on track construction and maintenance economies, F. B. Walker, chief engineer Eastern Massachusetts Street Railway, showed charts to indicate the amounts of track reconstructed, progress by years, derailments and costs in a rehabilitation program of his company. He also described a base plate joint construction used on his system. This paper is published in abstract elsewhere in this issue.

W. H. Sawyer, president of the American Association, spoke briefly and emphasized the need for recognizing the human element in all engineering work, instead of insisting that things be mechanically perfect. He said that the convention speaks for itself; it is the biggest and best ever held, but what are we going to do about it? Everyone is sure to go home with a thrill and with new pride in the work that they are doing and with the fact that they are electric railway men. Mr. Sawyer emphasized, however, that the job is just beginning. Engineers must work out the foundation on which to build for a better future.

"Economies Obtained with Modern Cars" was the title of a paper presented by W. R. McRae, superintendent rolling stocks and shops Toronto Transportation Commission. This paper brought out the thought that attractive cars are not sufficient. Maintenance methods must be improved and as a result costs will decrease. Mr. McRae described the modernization program as carried out by his company and spoke of maintenance improvements, cars, shops, track, line, record systems and new tools used. Results showed that this elaborate program has paid far beyond expectations and that modernization, if properly carried out, will convert a deficit into a surplus. A more extended abstract will be found on another page of this issue.

Discussion of this paper brought out that increased attention to the modernization of all maintenance departments eventually results in economies and also a reduced attention to service and creates a better feeling toward the railway by its patronage. Two of the speakers indicated that managements of some railways appear to be forcing maintenance departments to give too great attention to the reduction of costs instead of insisting on improved maintenance methods and use of better and more modern equipment for the work. If railways are to continue to exist, this attitude must change.

The concluding paper of the first session was on "Automatic Substation Economies," by W. E. Bryan, superintendent of power United Railways of St. Louis. This described how automatic substations are constructed in St. Louis and showed that a large saving has resulted over operation with manual stations. This paper is also abstracted elsewhere in this issue.

Committee Reports Presented

Way and Structures, Rolling Stock, and Power Divisions Hold Separate Meetings

THE second day's meetings of the Engineering Association were devoted to committee reports. To facilitate presentation of these three simultaneous sessions were held. The first was devoted to reports of the way and structures division, the second to the rolling stock committee reports and the third to power reports.

Way and Structures Division

Evidence of the extent to which track and roadway officials are studying the problems of their department of electric railway service was given in the quality and variety of reports presented at the meeting of the way and structures division of the A.E.R.E.A. on Tuesday. H. H. George, chairman of the committee and assistant to the chief engineer Public Service Production Company, Newark, N. J., presided and presented the report of the main committee. W. W. Wysor, chief engineer of the United Railways & Electric Company of Baltimore, was sponsor of the meeting. The interest of the members in the work of the division was shown by an attendance of 150 engineers and construction men.

In addition to the technical reports and discussions, a brief talk was made by Lucius S. Storrs, managing director of the A.E.R.A., in which he pointed out the important part good track construction and maintenance plays in good transportation.

"The best and cheapest investment a railway can make is good track. Smooth tracks are a necessity in this day, when the automobile with its pneumatic tires has taught the public to demand comfortable, easy-riding transportation," Mr. Storrs said.

In addition to the report of the committee on way and structures by Chairman George, two other regular committees reported. C. A. Smith, superintendent of roadway, Georgia Power Company, Atlanta, as chairman of the committee on road preservation filed the committee's report recommending several changes in the manual. He stated that the committee considered the major part of its work had been completed and recommended that it be discontinued as an independent committee, the industry to be kept advised of new developments in the future by a special committee of the division. A more extended abstract of this report will be found elsewhere in this issue. E. M. T. Ryder, way engineer Third Avenue Railway System, New York City, made a brief verbal report telling of the studies being made under the direction of the committee on welded rail joints.

Reports also were filed by a number of special committees. The report of the committee on rail corrugation was made by D. D. Ewing, professor of electric railway engineering, Purdue University. The variety of problems involved in this subject was indicated when Professor Ewing stated that "everything between the trolley wire and 10 ft. under the track" might be a contributing factor in this mysterious cause of damage to rail. Further particulars of this report appear on another page.

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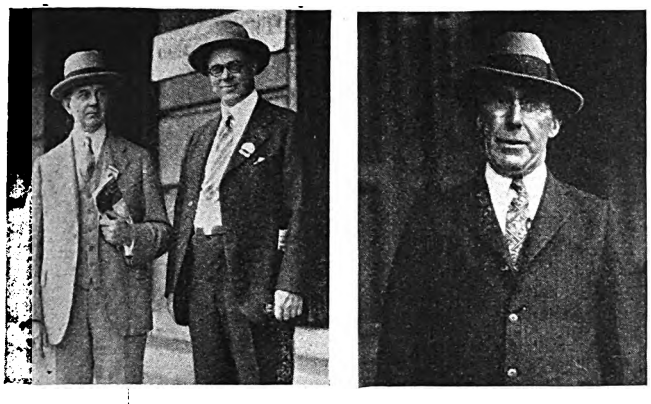

Left, A. T. Clark and W. W. Wysor; right, Terence Scullen

An interesting paper on corrugation was presented by E. O. Ackerman, maintenance of way engineer Columbus (Ohio) Railway, Power & Light Company. Mr. Ackerman told of his studies over a period of years and advanced the theory that corrugation was caused by synchronization of pulsating flow of power with tort vibration of axle and wheels, these vibrations becoming cumulative at certain speeds of the vehicle and causing corrugation.

W. R. Dunham, Jr., executive engineer Department of Street Railways, Detroit, made the report of the special committee on review of Manual. He suggested that in the section of the Manual W. 108-23 Rivets there should be a revision of paragraph 503 to read as follows:

"Rivets shall be of full diameter called for on plans, and rivet holes shall not be more than $\frac{1}{16}$ in. greater in diameter. When not otherwise called for by plans or specifications, rivets shall have standard button or cone heads of uniform size for the same size rivet. Countersunk rivets shall be flush with the surface and fill the countersink except that the rivets through base and tie plates may have a crown of not more than $\frac{1}{8}$ in. below the surface of the plate."

E. M. T. Ryder, Third Avenue Railway, read the report of the committee on special track work. It referred particularly to switch tongues and hard centers and is given in abstract elsewhere in this issue.

Arc-welding processes and welding rod specifications were reported on by C. F. Gailor, of New York, chairman of this special committee. This report was based on a very thorough study, and the committee says it believes the report represents the most reliable and up-to-date information possible to secure at the present time. It contained a set of rules to be observed in arc welding, a set of welding rule specifications, both contained in appendices which the committee recommended should be published for general distribution. The committee also recommended that further study be made of the subject, particularly of the cost of welding rods, comparison of welding rods and use of special alloy rods.

A. T. Spencer, general superintendent of construction and maintenance Montreal Tramways Company, gave the report on alloy steels other than manganese for special trackwork, and light section girder rails were reported on by C. A. Alden, chief engineer of the frog and switch division of the Bethlehem Steel Company. Further discussion of rails was contained in the report of the special committee on relative advantages of 7- and 9-in. girder rails, which was given by H. F. Merker, chief engineer way and structures Brooklyn City Railroad.

A. E. Harvey, superintendent construction department Kansas City Public Service Company, reported on the effect of modern vehicular traffic on paving in the track area, giving special attention to the effect of increasing loads carried by rubber-tired vehicles in breaking down paving subgrade.

Other track matters were discussed in the report on track ballast and drainage delivered by S. C. Baker, engineer maintenance of way East St. Louis Railway Company, and on track construction specifications by C. L. Hawkins, engineer maintenance of way United Railways of St. Louis. C. H. Clark, engineer maintenance of way Cleveland Railway Company, offered in lieu of a written report on track checking gage two gages designed for this purpose by his committee.

J. R. McKay, chief engineer Indiana Public Service Corporation, Fort Wayne, gave the report on bus garage design and told of work that has been done in co-operation with the National Fire Protection Association in an effort to arrive at acceptable construction specifications.

H. E. Bachman, of Newark, chairman of the special committee on car house and shop construction and wiring regulations, was unable to attend the meeting and no formal report was made. Chairman George stated that the committee on joint railway and bus terminals had been inactive during the year and announced the appointment of E. D. Eckroad, engineer maintenance of way northern Ohio Power & Light Company, Akron, as chairman for the coming year.

Rolling Stock Division

Assuming that the amount of discussion is an indication of relative interest, it appears that modern cars, car lighting and noise reduction are the live subjects in the rolling stock division. Thirteen special reports and three general reports were presented at the session, abstracts of which appear elsewhere in this issue. In the progress report on suction strainers for air compressors J. C. McCune, chairman, urged that greater attention be given to suction strainer maintenance. The report contained descriptions of some late type designs.

The committee on sidewear of motor brushes reported progress and recommended a continuation of its study. The special committee on gearing reported that no conclusions could be arrived at regarding relative merits of helical and spur gears.

The committee on overhead current collecting devices presented two sets of graphs, one plotted from information secured by previous committees and the other from data obtained from this year's committee. These graphs showed companies arranged in order of their wheel life, and the outside diameter of the wheel used and trolley pole tension were plotted for these companies. The graphs were very similar in wheel life, but the 1927 data show a wide variation in trolley wheel pressure against the wire. They also show a more uniform diameter for wheels used.

Power Division

At the meeting of the power division of the Engineering Association held Tuesday, Oct. 4, two important commitee reports were read and discussed.

The first, on power transmission and distribution, was read by Chairman F. McVittie, electrical engineer New York State Railways, Rochester, N. Y. The particular subjects covered in this report were specifications for catenary construction and materials, trolley wire wear, improving specifications for bronze trolley wire, radio

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interference, inductive co-ordination and design of distribution layout for automatic substations. The advisability of establishing a standard for comparing methods of operating and maintaining overhead lines and the standardization of trolley wire reels were also treated. A design of suspension for contact car and a specification for standard bronze trolley wire were reported as having been adopted by the standards committee. Further details of this report are published on another page.

The committee on power generation and conversion, W. E. Bryan, superintendent of power, the United Railways of St. Louis, chairman, had three specific subjects to report on: The ventilation of automatic substations, mercury arc rectifiers and economical trolley potential for congested districts of urban systems. The ventilation report included the results of an intensive three-year study on this subject. Other valuable information was given by W. E. Peters, C. A. Butcher and Pierre Blommers. The mercury arc rectifier report stated that no method of rating had as yet been agreed upon. Data on some rectifier installations were given by O. K. Marti. Results of tests on trolley potentials for congested districts were given. The economies effected by the use of certain voltages under various conditions were included in the report, of which further details are given on another page.

General Meeting Thursday

Motor coach engineering, overhead line maintenance, and aviation discussed

MOTOR coach design, overhead line maintenance and commercial aviation formed a varied program for the third and concluding session of the Engineering Association. The paper by H. D. Church, director of engineering White Motor Company, on trends in motor coach engineering brought out discussion as to developments that will provide greater accessibility of parts so that maintenance operations can be carried out cheaper and with less trouble. Light-weight construction through the use of aluminum or other light-weight materials appears as one development that will be watched closely. In answer to a question "Why Use Four Speed Gearing?" discussion showed that the speed steps of gearing for buses is determined usually by the worst conditions encountered.

New developments were referred to by Carl Stocks, editor of *Bus Transportation*. "An interesting feature," he said, "is the tendency toward automotive street cars on rubber tires. In the early days the automobile note was predominant in bus service. Engine location, lines of body, position of driver, all had to copy the private automobile as far as could be done with the much larger vehicle, or, at least, so it was thought. Now comes a new movement worthy of close study. Is the public concerned merely with getting somewhere as soon as possible regardless of the appearance of the vehicle, or has past favoring of the automobile type of vehicle had anything to do with the popularity of the bus?"

Maintenance of a large overhead system was discussed in a paper by M. W. Cook, superintendent of power and inclines Pittsburgh Railways, in which stress was laid on the great value of efficient overhead maintenance. Discussion brought out that proper organization to reduce detentions is most vital. Various speakers described things they are doing along this line.

The latest form of transportation, that by airplanes, was discussed in a paper, "General Aspects of Commercial Aviation," by R. H. Horton, former vice-president Philadelphia Rapid Transit Air Service. Mr. Horton traced the development of commercial air services since the war. Much of the progress has been in the mail service. He pointed out the dependability of this, and suggested that a method of payment be adopted that will more equitably compensate the carriers for the service rendered. Passenger air transport he holds to be one of the most important fields for development, although it has been sadly neglected.

The closing business of the session included the installation of newly-elected officers and the presentation of a past-president's badge to Daniel Durie, retiring president.

Conference on Welded Rail Joints

EXTENSIVE investigations by scientists and practical engineers conducted during the past year under the direction of the committee on welded rail joints of the Engineering Association were described at a meeting of the committee on the lower floor of the Auditorium Wednesday morning.

E. M. T. Ryder, way engineer Third Avenue Railway System, New York City, and vice-chairman of the committee, presided. Mr. Ryder stated that the committee, which is a joint committee of the A.E.R.A. and of the American Bureau of Welding, a research department of the American Welding Society, had outlined a series of investigations to determine the best type, size, shape and seam of welded joints, the effects of preheating and post-heating, the comparative advantages of use and non-use of base plates and the advantages of contact or compression of the joint. One hundred and fifty joints will be made up for these tests, and Mr. Ryder stated that approximately one-fourth of this number had been made up during the past year and turned over to scientific investigators.

Prof. H. L. Whittemore, chief of the division of mechanics, U. S. Bureau of Standards, Washington, described and presented charts showing the results of telemeter investigations into the effects of impact loads and static loads. O. S. Peters, also of the Bureau of Standards and an associate of Professor Whittemore in these studies, was scheduled also to speak but was unable to be present.

"Strain gage" investigations to determine the strains on seam-welded rails resulting only from the process of welding were described by Prof. L. H. Crook, of the department of mechanics, Catholic University, Washington. Studies along a similar line have been made during the year by Prof. Thomas R. Lawson, of Rensselaer Polytechnic Institute, Troy, N. Y., who told the committee about them.

W. W. Wysor, chief engineer United Railways & Electric Company of Baltimore, was in charge of a third series of experiments on the effect of "Impact on Joints Without Fishing Contact," and these were described by R. B. Fehr, of the Una Welding & Bonding Company, Cleveland, under whose direction the tests were conducted.

J. Wolfe, assistant superintendent of track and roadway Chicago Surface Lines, was elected a member of the executive committee, succeeding E. J. McIlraith, staff engineer of the same company, resigned.

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Standard Tongue Switch Indorsed

AT THE Engineering round-table luncheon on Wednesday emphatic approval of the new proposed standard solid manganese steel tongue switch was voiced by way engineers from all sections of the country. Drawings of the suggested design were distributed by E. M. T. Ryder, who sponsored the meeting and called for expressions of opinion. It was generally agreed that many advantages can be had by standardization of switches and that the proposed design meets the needs of the situation. Some doubt was expressed as to whether a 6-in. riser was sufficiently long. This matter will receive further consideration by the committee.

Representatives of special trackwork manufacturers stated that the standard switch could be supplied at the same cost as designs now used. Practically every engineer who was present agreed to install one or more of the new switches during the next year for experimental purposes.

Better Buying and Storekeeping May Help Industry's Finances

PURCHASING agents and storekeepers who attended the meeting of the purchasing and stores division on the afternoon of Tuesday, Oct. 4, were not left in any doubt concerning their rôle in the present-day transportation drama. They were told in no uncertain terms by President W. H. Sawyer, Lucius Storrs and B. J. Yungbluth, president of the International Railway Company, Buffalo, N. Y., that they were the "watch-dogs of the money-drawer"; that the financial stability of the electric railway industry depends, in large measure, upon their unceasing efforts to wipe out waste expenditures.

Should Widen Their Scope

Time after time the thought was advanced by the various speakers that purchasing agents and storekeepers, far from being mere routine cogs in an organization, should ever be widening their scope and becoming familiar with the activities of all departments in their respective companies. In this way these men become competent to assume a large share of the responsibility for coordinating more comp'etely the work of their departments with that of the remainder of the organization. By reducing the investment in materials on hand, more money is released in the "cash drawer" of the industry.

Greeted cordially by Daniel Durie, president of the American Electric Railway Engineering Association, and presided over by J. Fleming, assistant secretary and purchasing agent of the Capital Traction Company, Washington, D. C., and chairman of the committee on purchases and stores, those in attendance were unanimous in their feeling that the afternoon was a most profitable one.

J. G. Barry, vice-president of the General Electric Company, discussed the possibilities of further standardization of equipment and urged that operating companies improve their own financial condition by adopting, as far as is consistently possible, the standards that have been established by manufacturers and by the American Electric Railway Engineering Association. This would make quantity production possible to a much greater degree than is now the case and would benefit materially both operating companies and manufacturers.

Mr. Barry also suggested that a real source of saving would be found in a reduction of the number of separate orders sent to manufacturers by railway purchasing departments. A number of small orders consolidated on one sheet will cut down amazingly the amount of "paper work" by both buyer and seller. This reduction will mean savings, not of hundreds but of thousands of dollars a year to the railways, in the opinion of Mr. Barry.

Mr. Yungbluth, in emphasizing his point that the investment in materials on hand be kept as low as possible, cited the "horrible example" of one large company about two years ago which had more than $100,000 worth of special work on hand which had never been used and for which there was no immediate likelihood of a demand. At the time, the financial condition of this company was very dubious and it could ill afford this needless tying up of capital.

"Some Phases of Stores Practice" was the title of a talk by W. E. Scott, superintendent of supplies for the Philadelphia Rapid Transit Company. Mr. Scott has been active in the work of the committee on purchases and stores since its establishment in 1923, and he outlined in interesting fashion some of the accomplishments of this group since that time, mentioning particularly the effectiveness of the stock-book plan, adopted in the year 1923.

Mr. Fleming Reads Report

The report of the committee on purchases and stores for 1927 was read by Mr. Fleming and was adopted in its entirety by the members of the division. An abstract appears elsewhere in this issue. Particular attention was called to the simplified invoice form mentioned on page 12 of the report, and the division voted favorably on the committee's recommendation that this simplified invoice form be indorsed by the American Electric Railway Association.

An added note of interest in the meeting was given by the unexpected attendance of both Mr. Sawyer and Mr. Storrs. These men spoke from their own experience as operating executives in stressing the importance of purchasing agents and storekeepers in the progressive forward movement of the transportation industry. In other words, these jobs are as big as the men that fill them.

Ed Meissner receives Anna Case in the St. Louis car exhibit

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Newly Elected Officers of the American Electric Railway Association

J. P. BARNES
First Vice-President

PAUL SHOUP
Second Vice-President

R. P. STEVENS
President

J. H. HANNA
Third Vice-President

C. E. MORGAN
Fourth Vice-President

BARRON COLLIER
Treasurer

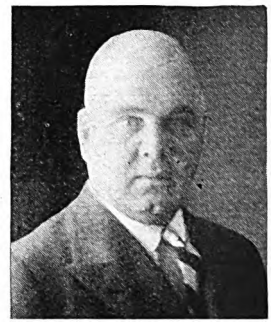
J. W. WELSH
General Secretary

New Members of the Executive Committee

J. H. ALEXANDER

D. W. SNYDER, JR.

J. G. BARRY



W. F. CUTLER

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T.&T. Plans for Increased Speed

Need for faster service emphasized at all meetings. Economies of bus operation and adoption of a uniform classification of accidents also discussed. Edward Dana becomes new president

METHODS of increasing the speed of car operation constituted the theme of greatest interest at the meetings of the Transportation and Traffic Association. The first session was devoted to a discussion of bus operation and it was brought out that buses can often be used to advantage in conjunction with cars to provide more rapid service. Much of the work done by the committee on traffic and safety, whose report was considered at the second meeting, was in the direction of speeding up service. Again at the third meeting the same thought was emphasized in the discussion of service betterment.

Careful study of the recommendations of the various committees was urged by J. V. Sullivan, retiring president of the Transportation and Traffic Association, at the opening session. He said that the statement in the report of the committee on bus operation that 80 per cent of the railways studied feel that bus operation is justified, even though a much smaller percentage were able to report revenue sufficient to pay a return on their investment, is evidence of real courage and a determination to carry out what these operators feel is an obligation to serve their communities. An outstanding feature of the report of the committee on traffic and safety to which he called particular attention is a suggested outline of subjects to be studied in making a traffic survey. Latest developments in traffic signal control are also ably presented, he said. The only way to sell our product, according to Mr. Sullivan, is through service betterment which involves comfort, convenience and speed of transportation. It involves also making transportation vehicles more attractive in design as well as in color.

In conclusion, he urged men of the operating departments to engage more actively in association work. By engaging seriously and studiously in committee work a man gets a more intimate knowledge of its important problems.

Views on Bus Operation

Report of committee provokes discussion as to whether buses can be run at a profit

WHETHER or not bus operation is profitable was the subject of lively discussion at the Monday afternoon session. R. N. Graham, chairman, briefly summarized the report of the committee on bus operation. Commenting on the report, L. V. Tighe urged that study be made to discover means of operating buses more cheaply so as to furnish mass transportation at lower cost. A. J. Brosseau said he had never heard of a profitable A.E.R.A. bus operation, but this, he believes, is because the value of bus operation has not been correctly appraised. B. C. Cobb differed from this opinion. He stated, however, that bus transportation is essential and that it can be made profitable by proper adjustment of service and fares. Garrett T. Seeley spoke of the indirect advantages of bus operation, such as smaller losses than would result from car operation under the same conditions. Combination bus and car service now being tried on Jefferson Avenue in Detroit was described by N. J. Shorn.

Experience in Cleveland with gas-electric and mechanical drive was discussed by M. W. Rew. He said that the gas-electric was more expensive, but possessed certain advantages in other ways. In the opinion of H. H. Hile it is desirable to keep the bus-operating personnel independent of the railway personnel, even though the services are co-ordinated. He emphasized also the importance of keeping bus weights down to a minimum. Care of tires was discussed by L. G. Fairbanks. A demonstration of the school of the Northern Ohio Power & Light Company for training bus operators was introduced by A. C. Blinn.

Lively Interest in Safety Work

Tuesday's joint session with Claims Association brings out need for careful analysis of accidents and their causes

PREVENTION of accidents was the subject of principal interest at the joint session of the T. & T. and Claims Associations on Tuesday afternoon. C. H. Evenson, co-chairman with H. K. Bennett, presented an outline of the work done during the year by the joint committee on traffic and safety.

Referring to the section of the report dealing with accidents N. W. Funk said that separation into chargeable and non-chargeable groups encourages trainmen to make greater efforts in safety work and explained the methods followed in Louisville. A similar opinion was voiced by William Paache, who stated that this separation had reduced accidents on the Chicago Surface Lines. Various changes were suggested by G. J. Kerwin in the present classification. George B. Anderson spoke of the desirability of adopting a uniform classification of accidents to permit comparison of what is being done on different railways. Lucius S. Storrs addressed the meeting briefly and emphasized the same point. D. L. Fennell said that recommendations for standardization had been made regularly and that the time had now come to take active steps to secure it. C. T. Boynton concurred in this opinion. J. V. Sullivan, presiding at the meeting, assured the members present that this matter would be taken up by the Claims Association. More attention should be given to the human element in safety work, according to A. J. Sarre. The need for wholesouled co-operation between management and men was stressed by J. P. Brown. The viewpoint of the Amalgamated Association of Street and Electric Railway Employees was presented by P. J. McGrath.

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The report of the committee on bonus and award system was presented by G. T. Hellmuth. H. V. Drown explained the bonus system used by Public Service Railway.

Discussing traffic S. E. Emmons said that enough consideration is not being given by traffic regulatory authorities to the relative number of people carried by various vehicles. The tendency is to consider a street car and a private automobile as equally important from the traffic standpoint, whereas the car is really carrying many times more passengers. Making a traffic survey is not enough, in the opinion of M. R. Boylan. The real job is to secure the adoption of effective regulations. It is doubtful, he thought, whether it is desirable for the railways to take the lead in this matter. J. B. Stewart, Jr., said that traffic regulation is not a job for amateurs, but should be attempted only by experts after careful study.

Speed Essential for Service Betterment

Higher schedule speeds can be obtained by attention to details of operation. New officers installed at closing session

METHODS of speeding up electric railway service constituted the theme of the discussion at the Thursday afternoon session of the Transportation and Traffic Association. S. E. Emmons presented a brief résumé of the report of the committee on service betterment. He emphasized the fact that increasing the speed of car operation is the greatest need today.

Mr. Emmons also said that since the report of the committee had been printed a question had arisen concerning the definition of average speed as given therein. This was defined as being the figure obtained by dividing the total passenger car-miles by the total passenger car-hours, including lay-over time. Because some members objected to this definition, he suggested that the figure so obtained might be called operating efficiency rather than average speed. He stressed the point that such figures formed a better basis of comparison between companies than figures derived without including lay-over time.

C. H. Evenson stated that lay-over time should not be included in speed calculations. He expressed doubt concerning the desirability of making more frequent stops during the middle of the day than during the rush hour, as advocated in the report of the committee.

The dictionary states that speed is a rate of movement, according to E. J. McIlraith, and the committee cannot create a new meaning where speed is determined by the length of rest taken after the trip is over. However, it is quite possible and highly desirable to create a standard practice among members in determining speed.

The standard practice should be to class operating speed as the average rate of travel while operating. It can be obtained as a comparable figure from any company that pays proper attention to its scheduling.

Much damage is being done, he said, by misunderstandings as to street railway speed. For example, in Chicago it has been customary to report to the state commission crew pay-hours as car-hours for certain standard statistics, even though more than 11 per cent of the pay time is for time allowances outside of platform and terminal time. As a result the Chicago Surface Lines has been frequently represented as operating at a speed of less than 9 m.p.h. Bus operating and manufacturing officials have stated at commission hearings, before the City Council and in publications, that the street railway speed is below 9 m.p.h. They obtained that figure by dividing car-miles operated by crew pay-hours, which is no different in principle, Mr. McIlraith said, from what the committee proposes. Such tactics may some day be used against each railway operator, and unless he has a clean record of speed of operation that truly represents the meaning of speed, it may prove very embarrassing.

A contrary opinion concerning the value of speed was expressed by L. W. Heath, who thought that the average car rider is not so much interested in speed as in frequency and regularity of service. The attention which is now being paid to betterment of service marks a new era in the electric railway transportation industry, according to F. L. Butler. Speed is of paramount importance, he said. In Atlanta increased speed has not resulted in any increase in the number of accidents.

Increasing the rates of acceleration and braking is an effective way of increasing speed, according to J. C. Thirlwall. Use of track brakes and automotive type braking equipment are possible ways of accomplishing quicker retardation. He said that from an engineering point of view there was no reason why the street car should not excel all other vehicles in rapidity of acceleration and braking. An opposing opinion was expressed by E. J. McIlraith, who pointed out that the necessity of carrying standing passengers makes it impossible to accelerate and brake street cars as rapidly as automobiles. In his opinion, much time is now lost between the movement of the motorman's brake handle and the effective application of the brakeshoes to the wheels. Design should be improved to correct this situation, he thought.

George L. Kippenberger suggested that the best way for the electric railway industry to secure betterment of service would be for it to follow the example of Henry Ford and purchase modern equipment, even though this involved scrapping much expensive equipment that is not yet entirely worn out. W. T. Rossell mentioned the use of loading platforms as an effective means of increasing the speed of cars. These also tend to increase the speed of other vehicles using the streets.

Other phases of service betterment were brought out by A. J. Manson and J. J. Moran. Mr. Manson said that courtesy and tact on the part of trainmen are nearly as vital as speed. Mr. Moran suggested that trainmen be instructed to tell passengers the reason for delays.

After the discussion of service betterment, the report of the committee on resolutions was received and adopted. This included an appreciation for the work done by the officers of the association and the manufacturers in making the convention a success and an expression of the grief felt by the association on account of the death of E. M. Walker during the past year.

Edward Dana, the incoming president of the T. & T. Association, was escorted to the chair and made a brief address. He said that a meeting of the new executive committee had already been held and work of the association for the coming year would get under way within ten days. The meeting concluded with presentation of the past-president's badge to J. V. Sullivan.

Other new officers of the T. & T. Association for the coming year are W. H. Boyce, first vice-president; Samuel Riddle, second vice-president, and Paul Wilson, third vice-president. Members of the executive committee will be George B. Anderson, R. N. Graham, F. L. Butler and Richard Meriwether.

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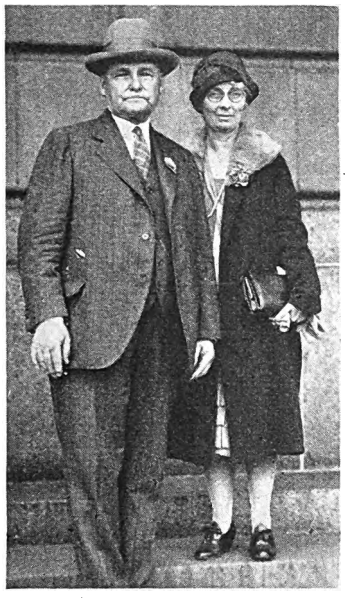
Accountants Bend Efforts to Solve Problems in Their Field

Reports and discussion show their earnest contribution to the advancement of accountancy in the industry. Referred to as the foundation stone of their organization. Bus accounting a subject of importance. T. B. MacRae was elected president

IN THE meetings of the American Electric Railway Accountants' Association at the Cleveland convention there was an impressive note that reflected the thought and earnestness that the accountants are devoting to a subject of vital importance to the electric railway and bus industry—accountancy. This body of men, referred to at one of the meetings as the foundation stone of their organization, are contributing to the science of railway accounting and endeavoring to solve the problems that arise in their field of work. A study of the reports of the various committees indicates not only the analytical student which the accountant of today is, but shows that he must have an essential grasp of all the details of the operations of his organization.



T. B. MacRae and Mrs. MacRae

Bus accounting was the uppermost subject apparently in the minds of a number of the members of the association, although it was for the most part informally discussed. Many interesting and informative points were evolved.

At the meeting of the executive committee on Oct. 2, President L. E. Lippitt of the association, with the approval of the committee appointed E. H. Reed, third vice-president of the association and auditor of the Brooklyn City Railroad, the association's representative on the national joint committee on taxation.

The opening session was called to order on Monday afternoon in Accountants' Hall, Cleveland Auditorium, by President Lippitt and was followed immediately by his address. In this he reviewed some of the matters that had engaged the attention of the association during the past year, first calling attention to the commitees that were appointed.

"Bus operation," he stated, "is playing a very important part in the transportation field. During the past year we have been working with some of the state commissions with the view in mind of having our classification adopted as a standard, and of course have met with some opposition. Nothing, however, was very serious, and we have hopes that, generally speaking, our standard classification will be used by the principal bus operators."

He expressed the belief that a national standard was highly important. Touching upon the subject of co-operation, Mr. Lippitt said: "Our association cannot fully measure up to its responsibilities without the co-operation of all of its company members and a real personal interest must be taken by them in the association's affairs." A communication from Past-President J. J. Duck was read expressing his regret at not being able to be present.

The report of the committee representing the Accountants' Association at the annual convention of the National Association of Railroad and Utilities Commissioners, W. L. Davis chairman, was read by O. H. Bernd, and received. It gave an account of this meeting.

Prior to the reading of the report of the committee on bus accounting by M. W. Glover, the president expressed his belief that this committee was one of the most important and that bus accounting seemed to be one of the foremost subjects before the association at present. The report is presented in abstract on another page. An informal discussion followed on the best method for bringing the classification before the various state commissions, after which the report was adopted.

Mr. Glover also read the report of the committee on standard classification of account. This report, which is abstracted on another page, was approved. Tribute to the splendid work of Mr. Glover in the association was paid him by Mr. Heberle, in which President Lippitt joined. Announcement was made that a get-together luncheon would be held at the Cleveland Athletic Club on Wednesday at 1 o'clock.

The address of the afternoon was delivered by Harry Boggs of Herdrich & Boggs, certified public accountants, Indianapolis, who took for his topic "Evolution of Regulation and Accounting." This made a marked impression on the association, so much so that he was the recipient of a rising vote of thanks from the members in addition to the thanks of the chair.

Announcement was made by Mr. Lippitt of the presence in the meeting of President Willits H. Sawyer of the American Electric Railway Association. Stirring, impressional and short, sum up the characteristics of President Sawyer's talk. He told the members that he wanted them to know that he was really interested in their association. Anent the subject of why more accountants did not attend the meetings of the association, he told them that in the final analysis they were the men to whom executives must come for facts. He called their

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attention to the time when a man was only a bookkeeper and pointed out the respect in which the accountant of today was held.

The following committees were appointed by the chair: On nominations, T. Kilfoyle, Cleveland; F. E. Wilkins, Youngstown, and W. A. Blasing, Glens Falls, N. Y.; on resolutions, C. E. Yost, Wilmington, Del.; J. P. Hudson, Montreal, and Walter Shroyer, Anderson, Ind.

Buses and Fares Discussed

Reports of committees received and commented on at Tuesday session. W. L. Barnhart speaks on methods for combating embezzlement

THAT bus accounting is a subject to the forefront in the minds of a number of the members of the American Electric Railway Accountants' Association was again evident at the second session of this association. Although discussed informally, it is perhaps safe to say that more interest has centered around it than any other subject during the convention. Many interesting points were brought out and reflected the clear thinking and study of men who are devoting their best efforts to an analysis of the numerous phases the question presents. That it is a subject of national import was evident. Particular attention was paid to the angle of depreciation in bus accounting.

The report of the committee to review the proceedings of the Accountants' Association was first on the program. J. E. Heberle, chairman, advised that the committee had no report to make. Attention of members was directed to the value of the bound volumes of the printed proceedings of the association and particularly the use of the index, to which ready reference could be had to find out whether a study had been made of a special subject.

E. A. Tuson stated that the committee on fare collection had no formal report to make and indicated that it was the feeling of the committee that the subject did not require an annual report but needed to be kept up to date. He suggested that the members look at the exhibits of the machines pertinent to their line of work.

An interesting discussion followed on the use and advantage of certain types of machines, in which T. H. MacRae, President Lippitt, M. W. Glover and others took part. Another interesting and informative discussion ensued on the subject of a clearing house for tokens.

The speaker of the afternoon, W. L. Barnhart, took for his subject "Combating the Present-Day Criminal," reference to which will be found elsewhere in this issue, which he illustrated with exhibits. At its conclusion President Lippitt thanked him on behalf of the association.

An informal discussion followed on bus accounting, after which the meeting was adjourned.

Graphs an Aid to Accounting

Economies effected by their use illustrated with charts at Thursday session. Resolutions adopted and officers elected

FOLLOWING the opening of the final meeting on Thursday afternoon by President Lippitt, a brief oral report was made for the committee on graphs by C. R. Mahan, chairman, comptroller Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., explaining that most of the work had been done by correspondence. J. F. Egolf, general manager Chicago, North Shore & Milwaukee Railroad, who was present at the meeting and was on the program for "Economies Effected by Use of Graphs" had appointed A. Christesen, general manager's engineer, to act in his stead. Four graphs were then shown and an analysis of them made by Mr. Christesen.

Among them was one comparing passenger car-miles by months with last year and comparison of passenger revenue obtained by months with last year and another

Welcoming Miss Anna Case to the car exhibit

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on merchandise dispatch station labor summarized chart showing the cost of handling per ton by months, also M.D. car-miles tonnage and train labor. Mr. Christesen also enumerated other charts which they made.

The report of the committee on stores accounting, abstracted elsewhere in the JOURNAL, was presented by R. A. Weston, chairman, special accountant of the Connecticut Company, which was followed by the address of the afternoon, "Passenger Revenue Handling," by Horace L. Howell, consulting engineer Meyer & Wenthe, Chicago, Ill., an abstract of which appears elsewhere in this issue. Mr. Howell did not read his report verbatim, deeming it unnecessary as copies of the pamphlet had been distributed prior to the meeting, but instead he took excerpts from it, which he amplified. He also analyzed some of the average fare charts which appear in the back of the pamphlet.

This was followed by the report of the committee on nominations by T. P. Kilfoyle, chairman which recommended: For president, T. B. MacRae, general auditor Chicago Rapid Transit Company, Chicago, Ill.; first vice-president, O. H. Bernd, secretary Des Moines City Railway, Des Moines, Ia.; second vice-president, Edwin H. Reed, auditor the Brooklyn City Railroad, Brooklyn, N. Y.; third vice-president, C. E. Yost, assistant secretary-treasurer Wilmington & Philadelphia Traction Company, Wilmington, Del.; secretary-treasurer, J. W. Welsh, executive secretary American Electric Railway Association, New York. Members at large: J. E. Heberle, assistant to president the Capital Traction Company, Washington, D. C.; Edward A. Tuson, general auditor Public Service Railway, Newark, N. J.; C. R. Mahan, comptroller Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.; L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Officers were duly elected and Lucius S. Storrs, managing director of the American Electric Railway Association, stopped in for a few minutes and expressed his pleasure at being with them.

The installation of officers followed and Mr. MacRae, the incoming president, after taking the chair, advised the members that he had always been a great believer in constructive criticism and that he would be more than glad to receive suggestions or criticisms on matters that might be done.

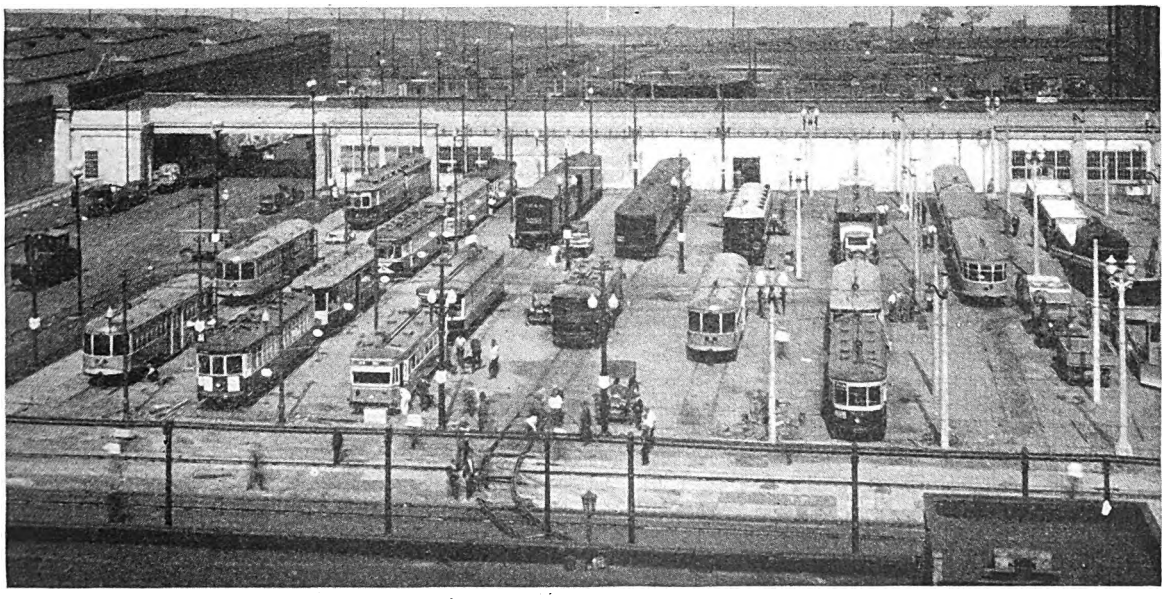
Get-Together Luncheon Held by Accountants

INTERSPERSING pleasure with business, the members of the Accountants' Association held a get-together luncheon at the Cleveland Athletic Club Wednesday afternoon, with 34 members present. An informal discussion took place of subjects that were of much interest and thought to the members, reflected by the responsiveness with which they participated. "Fare collections," "lost and found department" and classifications were the principal themes.

The meeting of the new executive committee was called to order by President L. E. Lippitt immediately after the luncheon. On motion of C. E. Yost, the meeting was turned over to T. B. MacRae, first vice-president. Committee chairmen were then appointed as given in the following:

Bus accounting, E. A. Tuson; standard classification of accounts, M. W. Glover; stores accounting, R. A. Weston; freight accounting, W. Shroyer; review of the proceedings of the Accountants' Association, J. E. Heberle; program, E. H. Reed; fare collections, E. A. Tuson; joint committee on engineering-accounting, L. T. Hixson; committee representing the Accountants' Association at the annual convention of the National Association of Railroad and Utilities Commissioners, W. L. Davis.

Preceding adjournment of the accountants a suggestion was made that a joint session of the purchasing agents and storekeepers and accountants be held next year.



Attractive designs featured the car exhibit on the outdoor tracks

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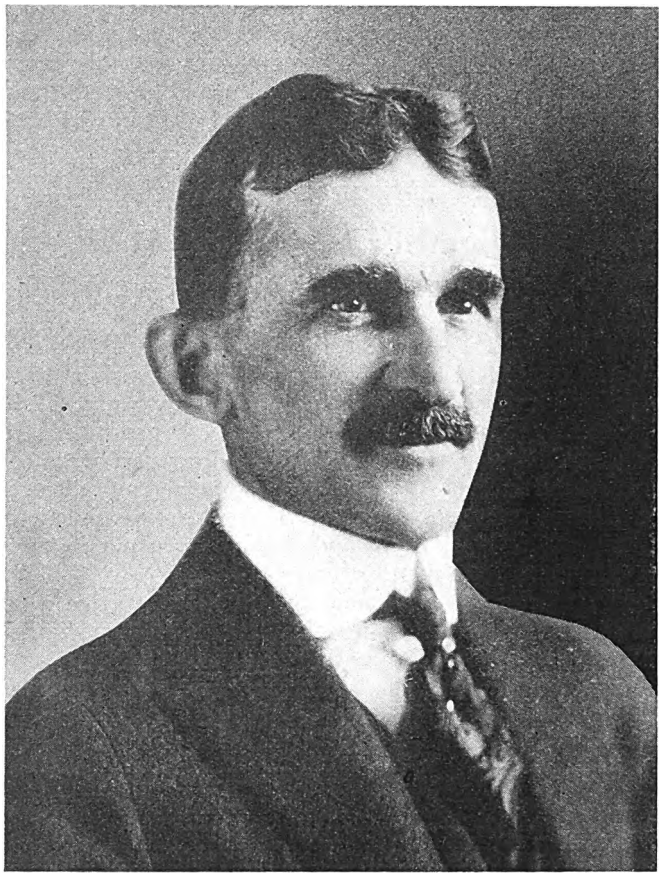


R. H. Dalgleish

R. H. Dalgleish

New President of Engineering Association

THE Engineering Association at its meeting on Oct. 6 elected R. H. Dalgleish, a popular electric railway engineer, its president.

Mr. Dalgleish is chief engineer of the Capital Traction Company, Washington, D. C., which company he joined in 1892. Step by step he advanced until in 1919 he became chief engineer. A special honor was conferred upon him in 1922 when he was elected president of the Washington Society of Engineers, comprising in its membership most of the prominent engineers in all branches who make their headquarters at the capital.

His service with the Engineering Association has been noteworthy for his active committee work. In 1921 he served as chairman of the committee on equipment. He had previously been a member of this committee. The following year he was chairman of the committee on specification for air tanks, a line of work requiring expert engineering knowledge. His enthusiasm for company section work in the association led to his election, in 1916, as president of the Capital Traction Company section. He has also served as chairman of the Washington section, A.I.E.E.

He is a graduate of the Cochran Scientific School, now part of the George Washington University.

T. B. MacRae

Heads Accountants' Association

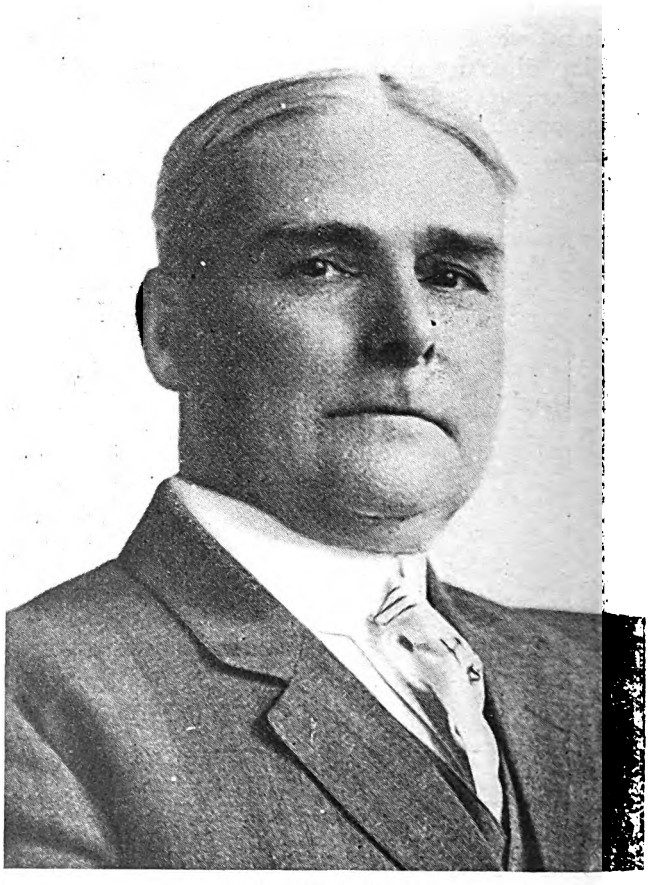
THE auditor of the Chicago Rapid Transit Company, T. B. MacRae, will serve as president of the Accountants' Association during the coming year. Mr. MacRae has been in the electric railway field since 1882.

His first position was with the Chicago & Northwestern Railroad in its local freight office in Cedar Rapids, Ia. Here he remained with the company about three years, when he entered the freight auditor's office of the Burlington, Cedar Rapids & Northern Railroad. After two years in this department he was appointed traveling auditor and subsequently chief accountant in the general auditor's office. In June, 1902, this company was taken over by the Chicago, Rock Island & Pacific Railway and he was transferred to Chicago to close the books and accounts of the absorbed company. He remained with the Rock Island Lines until March, 1905, when he was elected auditor of the Metropolitan West Side Elevated Railroad, at that time an independent corporation.

In September, 1911, the four elevated railroads operating in Chicago were brought under a unified management and Mr. MacRae was elected auditor of the individual companies. These four companies were consolidated on Jan. 1, 1924, under the corporate name of Chicago Rapid Transit Company and he was elected auditor of the consolidated company.

With this background of experience in electric railway accounting in its every phase, and with many years of fruitful activity with the American Electric Railway Accountants' Association, Mr. MacRae brings to his new task a combination of talents that is unusual.

Mr. MacRae was born in Jackson, La. He was educated in private schools and at the United States Military Academy.



T. B. MacRae

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Edward Dana

New President Transportation & Traffic Association

EDWARD DANA, the new president of the Transportation & Traffic Association, has for many years rendered valuable assistance to that association, and has, at various times, been a member of the committee on standards, rules and schedule in addition to the executive committee.

Mr. Dana's first position in the electric railway field was in July, 1907, with the Boston Elevated Railway, where he spent four years in an apprenticeship course, starting as a conductor. He then became an inspector of service conditions, assistant to superintendent of transportation, superintendent of traffic, transportation manager, and in August, 1919, was called to fill his present position of general manager. He was born July 28, 1886, at Bernardston, Mass., and was graduated from Harvard University with an A.B. degree in 1908.

Mr. Dana's interest in education, particularly of electric railway employees, is known throughout the world. He believes every employee should have all of the education that he or she can absorb. On the Boston Elevated property all educational courses are voluntary, unless the course is put in as a means of instruction in specific duties. Every opportunity is given to employees to know what the educational program is, but beyond that it is up to the employee.

Mr. Dana is ever on the alert for new ideas, and when one comes along he asks first, does this new idea have any application on the Boston Elevated Railway? Then, what is its significance to the industry as a whole?

Mr. Dana likes to see all of the railway data tabulated and if possible put into graphical form. One of his hobbies is the little leaflet "Co-operation" which goes to all employees monthly and to a constantly enlarging mailing list.

While a strict disciplinarian, Mr. Dana never forgets his duties toward the employees as human beings.

Edward Dana

J. S. Kubu

Joseph S. Kubu

President Claims Association

THE new president of the American Electric Railway Claims Association for the coming year is Joseph S. Kubu. Mr. Kubu is superintendent of the accident department of the Cleveland Railway and his election is a graceful gesture to the city which has played host to the American Electric Railway Association for two years.

Back in 1909 Mr. Kubu joined the forces of the Cleveland Railway as an investigator-adjuster and assistant claim agent. Perhaps feeling that, like a prophet, an electric railway claims man is "without honor in his own country," Mr. Kubu left Cleveland for the Empire State in 1912 and became claim agent for the Utica Lines of the New York State Railways. His work with this property was of an order which attracted the attention of many railway executives of the East and Mr. Kubu's services were sought by several of them. He refused all offers, however, until in 1921 the Cleveland Railway called him. Then he left Utica for home fields.

Mr. Kubu's long experience in claims work, his wide acquaintance with men in this department of public utility service and his active participation in the work of the Claims Association eminently fit him to direct the important work of this group during the coming year.

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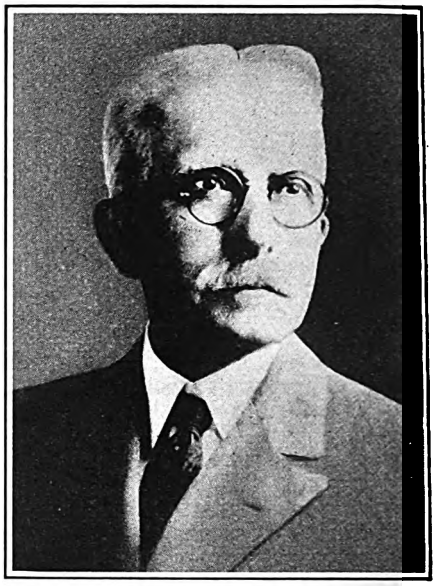
Claims Men Discuss Traffic Regulation

Uniform traffic laws strongly recommended as a means for reducing accidents. Co-operation in enactment of Hoover code urged



C. B. PROCTOR

THE opening meeting of the Claims Association was called to order on Monday by President Proctor and at his request the names and companies of all the delegates in attendance were given. A good-sized room had been provided and it was comfortably filled throughout the meetings, which were characterized by close interest.

Mr. Proctor observed, in his annual address, that the work and responsibility of claims men increase greatly year by year. He said that new and more difficult problems are continually presenting themselves. Therefore the question arises, "How can a claims agent best fit himself for his job; keep his mind fresh and alert; keep up with the times?" This cannot be done by living within oneself. The claim agent must study, read and confer with his fellows, who are tackling the same problem as the claims men.

It has been the endeavor of the Claims Association to increase the interest in the work of that body by injecting new features into the meeting. The progressive, wide-awake claims agent in the past few years has largely improved his standing with the public at large as well as with his own management.

The address of Russell A. Sears on proposed uniform traffic regulation and the Hoover conference recommendations is abstracted elsewhere in this issue. It was followed by formal discussion by John J. K. Caskie, Hubert A. Smith for Frank J. Gatrell and F. R. Cogswell for Burton W. Marsh. Mr. Caskie made the point that progress in traffic control should be aided by the claims department only in co-operation with the transportation department. He said that as the older cities of today became the newer cities of the future the opportunity is presented to direct this development so that traffic movements would be facilitated. He recommended creation of a committee including representatives from principal cities, to accumulate data on traffic legislation for the purpose of bringing about uniform regulation in conformity with the Hoover code.

Herbert A. Smith said that the public must be awakened in order to obtain proper legislation and enactment of the Hoover code regulating motor vehicle operations. He felt that the parent association should put forth its best efforts to aid in making the code effective throughout the country and advocated the adoption of a resolution so providing.

Mr. Barnes gave a most interesting talk covering his experiences in the work of the Hoover conference on street and highway safety.

In the general discussion that followed and on the motion of Wallace Muir provision was made for the presentation of resolutions addressed to the parent association and emphasizing the interest of the association in the traffic control provisions of the Hoover code.

At this point President Sawyer addressed the meeting and stated that he thought there was no single group of men in the industry that has more completely adapted itself to changing conditions than have the claims men. He spoke of their fair treatment of the public and of their care in preventing payment of fraudulent claims.

Mr. Hardin's paper was received with much interest and appears in abstract on another page. In the discussion that followed there was general agreement touching the necessity for all members reporting to their index bureaus so that fraudulent claimants and "repeaters" could be detected.

Tuesday's session of the Claims Association was held jointly with the Transportation and Traffic Association to consider questions of traffic and safety. A report of this meeting will be found in the account in this issue of the meetings of the Transportation and Traffic Association.

At 1 p.m. on Wednesday the great majority of all the claims men gathered at a strictly informal luncheon at the Hollenden Hotel.

Claims Symposium Arouses Interest

Various views on live claims topics presented by active claims men at the Thursday afternoon session

THURSDAY'S session of the Claims Association was given up partly to a symposium on claim subjects, partly to the papers secured by the medical and surgical committee and partly to the election of officers and other closing exercises.

The "symposium" comprised discussions on a great variety of topics, all having a very practical bearing on claims work. Some of the speakers had prepared extensive papers; others contented themselves with shorter presentations. Among the former, one by P. W. Klabunde on a recent campaign conducted by representative lawyers in Milwaukee against unfair legal tactics of some attorneys there, and one by J. C. Desautels of

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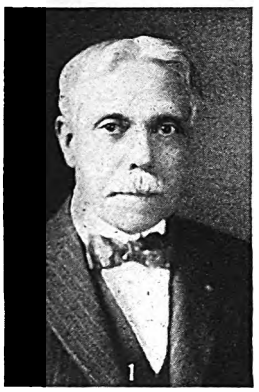
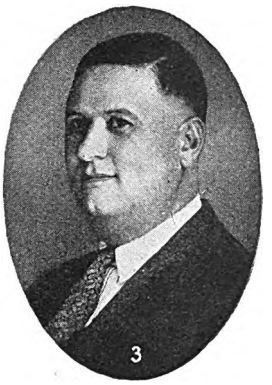
Montreal on a card index system he had developed are published in abstract elsewhere in this issue.

On the other topics considered, Walter E. Robinson, Cincinnati, took the position that publicity is not a proper activity of the Claims Department. The matters requiring the attention of this deparment are more or less of a confidential character. He thought that ambulance chasers had thrived on publicity in regard to accidents and claims. While heartily in favor of safety in its broadest sense, he believed that slogans could not be substituted for discipline, nor the responsibility for the safe operation of a railway property left to any one except the responsible operating official. Safety work is an obligation on all departments and should be performed without noisy campaigns, the payment of premiums for discharging a plain duty, or the effort to stampede the public and employees by cheap and ineffectual methods of advertising. Finally, he protested against the demands for affiliation with outside organizations. He considered the topics discussed by them often to be not closely related to claims work.



Augustus Baker

J. C. Desautels



P. W. Klabunde

J. W. Giltner

W. E. Robinson

Augustus Baker, adjustment department, Pittsburgh Railways, spoke on "Corrective Management and Its Effect on the Accident Records," and referred particularly to the Better Traffic Committee organized in Pittsburgh to deal with street traffic congestion. It had conducted an essay contest for children on accident prevention, had dealt with automobile parkings and had assisted in the enactment of traffic laws. He also mentioned the monthly management conferences on the Pittsburgh Railways' property to bring about better operation and maintenance. Each employee is made to feel he is an integral part of the organization, and this policy has been followed by a notable decrease in "pull-ins" and accidents. Safety measures include a central safety committee, trainmen's safety meetings and competition between carhouses for low accident records.

"Friendly enemies" was the title of the talk by J. W. Giltner, Akron, Ohio, referring to the attorneys for the plaintiff in damage suits. With the reputable lawyer in such a case, the speaker said, the claims men could have no quarrel. He believes that all men are animated largely by the same motives, and with these attorneys, the claim agent gets back largely what he gives. The only fault that can be found is with the so-called ambulance-chasing attorney. The speaker then pointed out that the plaintiff's home was the company's greatest hazard and greatest opportunity. The home becomes the hazard when the claim agent fails to take proper care of the person whom the company has injured. He thereby creates a fertile field from which the "friendly enemy" reaps a bountiful harvest. The home becomes the opportunitw when the claims man takes proper relief there, for he has then proved the company worthy the confidence of its community.

The symposium on claims subjects was followed by that portion of the program devoted to the medical and surgical committee. There were nine doctors present who participated in the discussion.

Dr. H. M. Bascom, chief surgeon Illinois Traction System, submitted a paper, "Should All Accidents Have Medical Investigation, and If So, What Information Is Helpful to the Adjuster"? He took the position that all cases of injury should be looked at from a surgical as well as from a medical standpoint. He felt that there should be at all times a state of complete co-operation between the physician representing the company and the patient's family doctor.

Abstracts of papers presented at the medical and surgical sessions by Doctors Fisher, Miller, Sibley and Leeming appear, in abstract, elsewhere in this issue.

In the discussion following the medical reports Mr. Boynton of Portland, Ore., said it would be of great help to all claims men if the doctors would make their reports in plain English. He said that he had many times found it necessary to refer to the dictionary in order to see what was wrong with the patient only to find that the case was merely one of bruises or slight skin abrasions.

President Proctor announced the appointment of a committee on resolutions on uniform traffic regulations as follows: John J. K. Caskie, Wallace Muir, John J. Reynolds, W. F. Weh and S. W. Baldwin.

The report of the nominating committee was made by Mr. Reynolds, its chairman, as follows:

For president, Joseph S. Kubu, Cleveland Railway; for first vice-president, L. F. Wynne, Georgia Power Company, Atlanta, Ga.; for second vice-president, Walter E. Robinson, the Cincinnati Street Railway; for third vice-president, C. E. Redfern, United Electric Railways, Providence, R. I. Executive committee: W. E. Foley, Third Avenue Railway, New York; B. F. Boynton, Portland Electric Power Company; S. J. Herrell, Knoxville Power & Light Company, and L. H. Butterworth, Boston Elevated Railway; convention secretary, G. T. Hellmuth.

Mr. Reynolds presented to President Proctor a past-president's badge and accompanied it with a splendid address outlining Mr. Proctor's unselfish services to the association.

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Milwaukee's Ambulance Chasing Quiz*

By P. W. Klabunde
General Claims Agent
Milwaukee Electric Railway & Light Company

OVER a period of years the activities of ambulance chasers in Milwaukee and its neighboring cities grew to the point where approximately 90 per cent of personal injury litigation was in the hands of but five or six law firms. There was evidence that runners worked openly and had developed a tip-off system through newspaper reporters and others. They frequently learned of accidents and reached the homes of injured persons before their families heard about them. Contracts were frequently procured in hospitals before the injured had recovered from the first shock. Chasers were ready to remove the injured from the hospitals, sometimes before the doctors could make their examinations. The evil was discussed by the Bar Association at times, but no definite action was taken.

Several years ago an independent organization of attorneys was formed, under the name of "Lawyers' Club," one of the objectives of which was to rid the bar of this evil. This club worked quietly until March, 1927, when a committee of its directors and officers petitioned the Circuit Court to conduct a hearing or inquisition and to take such action as the facts might warrant.

The petition was presented to a judge of the Circuit Court, there being eight branches of this court, and he decided that the petitions should be heard. Two other judges of the same court joined in the hearing, the three judges sitting *en banc*.

The matter was handled entirely by the Lawyers' Club. There was no assistance from public utilities or insurance companies, either financial or by way of providing information from which to develop the facts. The Lawyers' Club caused a study to be made of cases pending in the Circuit Courts and in the Civil Courts (the jurisdiction of the latter is limited to $2,000); plaintiffs in pending cases were evidently interviewed beforehand and then subpœnaed. Lawyers and ambulance chasers, their clients and representatives of public utilities and insurance companies were also called into court.

The testimony developed instances of champertous contracts, suits filed without the knowledge or consent of claimants and suits filed between members of the same family, where, so far as the parties to the actions were concerned, the same law firm represented both sides. It also developed instances where claimants were fleeced by their attorneys not only of exorbitant fees on a percentage basis but of practically the entire proceeds of the settlement. It also was revealed that solicitation was practiced in other than personal injury matters.

In the early stages of the inquisition efforts were made on behalf of the ambulance chasers to stop the proceedings, but the Supreme Court of the state denied an application for a writ of prohibition. One individual attempted to stop the proceedings, temporarily at least, by starting an action against the committee members. He served notices for examination on them under our discovery statute, the notices being accompanied by an affidavit alleging that the entire proceeding was in the nature of a conspiracy for the purpose of destroying his good name and reputation and that it was an attempt to perpetrate a fraud upon the court.

This attorney came into court and was requested by the judges to testify under oath as to the facts relative to his charges of fraud. He refused to be sworn and was sentenced to serve a term of 30 days in the county jail for contempt. The judge of another branch of the Circuit Court issued a stay, but the Supreme Court vacated this order; however, the Supreme Court then called for the entire record of the inquisition and the matter is still under consideration.

The inquisition has not been completed, but thus far it has accomplished these results: the complete cessation, so far as we can discover, of ambulance chasing by runners from lawyers' offices; an injunction restraining all ambulance chasers and attorneys in "tainted" suits from making any disposition of cases then in their hands; where evidence of improper contracts was disclosed, attorneys have been required to relinquish their claims and the claimants authorized to engage other counsel or to handle their claims in any other manner they choose; even where the claimants expressed a desire to retain the same attorney, the court has refused in most instances to permit them to do so.

Another result is that people who have had claims handled by attorneys are now making inquiry as to how their claims were disposed of. It has been rather interesting to learn how the proceeds of settlements were divided. For example, one claimant, who signed a release for $50, was given $175 as his share, whereas two other claimants, having claims arising from the same accident and who each signed releases for $200, received $20 each.

A still further result of the inquisition is found in personal injury cases going to lawyers who never before handled such cases. They could not get them because the runners worked too fast.

Our legislature was in session during the inquisition, and the Lawyers' Club and the judges were instrumental in introducing several bills for its consideration. Briefly, these bills provide:

First, that all investigators and adjusters should be licensed.

Second, that no settlement of a personal injury claim should be valid if made within ten days of the happening of the accident, and that any settlement should be subject to review upon petition of the injured person to the Circuit Court within 90 days.

Third, that upon demand of either party upon the other the names and addresses of all witnesses must be produced; this bill did not limit the names of witnesses to those that would probably be produced on trial, but included all that the adverse party knew of or discovered prior to trial.

Fourth, that there should be no solicitation in any manner, that there should be no payment, direct or indirect, to any person for bringing a case to an attorney, and that no attorney should "split" fees with others than attorneys.

The legislature acted upon these bills and the first three were defeated; the fourth, however, was passed and is now in effect.

The members of the Lawyers' Club who were active in the conduct of the inquisition devoted many days to this work, without hope of reward other than the cleansing of the bar. Not one of these active participants, so far as our records show, has been retained in a case against us since the inquisition started.

As stated earlier, there was no active participation by public utilities or insurance companies in the entire matter. Of course, representatives of the various companies

*Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Oct. 3 to 7, 1927.

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who were subpœnaed supplied the information asked for on examination, but it was the general feeling that the companies could not take an active part without creating the impression in the public mind that the corporations were trying out a new way to reduce accident costs.

When the entire inquisition is completed, it is believed that the solicitation of personal injury cases will have been very effectually curbed, and it is not unlikely that several members of the bar will devote their time to other employment.

Cost Reducing and Simplifying Claims Office Work*

By J. C. Desautels
Acting Claims Agent Montreal Tramways

I MADE a survey recently of the many details attached to the office end of the work. We had seven books of different kinds, large and small, some easy to handle, others quite cumbersome, but all needing several unnecessary movements—entries which I thought could be eliminated.

My first attempt to reach a solution was the cards shown herewith. One was devised to show accidents only, the other to show incidents. I thought of combining the main points of the history of a claim or incident on one card as well as a foolproof follow-up to show at a glance the movements of the file and its exact location.

The principle that I had in mind and wanted in practice was "one place, one movement to get the file," and as it is human to follow the line of least resistance, the card was arranged in the exact sequence that the work progresses from inception to finish.

To avoid mistakes, it was decided that all files, documents, etc., must go first and always to the clerk having the sole and full charge of distribution.

Arrangement of Card

The name and address are at the top and bottom, so that when card is taken off the filing system, becoming what is called "dead records," the card can be filed vertically. The top part is then the guide to the card. The abbreviations used are as follows:

Emp. Record. A tick here shows that proper information has been entered in the employee's claim record.

Inv. No. Means by whom investigated.

List. A tick here shows that the crew of the car or train have been seen by investigator.

Steno. (Stenographers), Abeyance, Ready. A tick in the space reserved for any of these would show in whose hands the file is.

Same as. To show that other claims have been made for the same accident.

Train. To classify or differentiate from the next abbreviation—namely, O.M.C. (One-Man Car).

Bus. For all bus accidents.

T. For accidents at terminals.

O. C. This space is reserved for a conventional sign or mark to help in summing up or valuation of O.C. (Outstanding Claims).

The rest of the card needs no explanation. Arranged in this way, the moment a claim is filed the first entry is at the top of the card and so on until the case has passed through the courts, judgment rendered and cost entered, if any.

I do not claim to have discovered the 100 per cent per-

*Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Oct. 3 to 7, 1927.

NAME IN FULL | ADDRESS | CLAIM NO.

DATE OF ACCIDENT | NATURE OF ACCIDENT | ACCIDENT NO.

PLACE OF ACCIDENT | DATE CLAIM ENTERED | EMP. RECORD | DATE CLAIM STARTED

INV. NO. | INVESTIGATION FINISHED | LIST | STENO. | ABEY. | READY | SAME AS | TRAIN | O.M.C. | BUS. | T. | O.C.

DECISIONS OF CLAIM'S COMMITTEE

AMOUNT OF CLAIM | DECISION | DATE | DECISION | DATE | SETTLEMENTS EXCEPT THOSE OUT OF COURT OR BY JUDGEMENTS: AMOUNT | DATE

WRITS—SUITS—ACTIONS—OR NOTICES OF ACTIONS SUIT No.

DATE OF NOTICE | DATE OF WRIT | COMPENSATION ACT | PLAINTIFF'S LAWYERS

AMOUNT | AMOUNT | IN FORM A PAUPER IS | DEFENDANT'S LAWYERS

SETTLEMENTS OUT OF COURT AND JUDGMENTS FORM 193

OUR COSTS | TOTAL AMOUNT

OCCUPATION | AGE | ADDRESS | CLAIM NO.

NAME IN FULL

Report No. 193, on a card 5x8 in., has proved most useful in indexing claims records

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fect card or handling classification and follow-up of a claim, but I do pretend that this system resulted in the following:

1. Cost of printing, binding, etc., of seven books eliminated.
2. An electroplate has been made which will save cost of printing when other cards are needed.
3. Going from one book to another and constant handling of them eliminated.
4. One movement and to only one place, always.
5. Nothing left to memory and checking reduced to the minimum. It is necessary simply to follow the lines and fill in as the work progresses.
6. Duplicating and sometimes triplicating of entries eliminated.
7. Records conserved clean, orderly, visible and readily accessible.

The only book used is the 60-subdivision-numerical index.

By actual stop-watch test, from 60 to as much as 200 per cent of time is saved.

All investigations outside of claims are handled in the same way but on the second card shown, so as to eliminate further unnecessary hunting up of the file.

With this system, inaugurated Jan. 1, 1927, not one of the papers and numerous files has been mislaid so far. I also believe that an appreciable amount of red tape is avoided and the equivalent time saved thus applied to constructive instead of detail work.

Possible questions will be raised in advance and answered:

Why is another numerical index necessary?

If claims were handled alphabetically, direct from the visible index, we should have to run through names on claims which have been disposed of years ago, whereas, by the present system, we have live records only to handle. Moreover, cost is reduced to minimum by using three visible index cabinets only. When they are filled, the first one will contain only records which are dead, or nearly so. We then transfer the cards into a vertical position in ordinary drawers. This explains why the name and address, etc., appear at the top as well as at the bottom of the card. In the visible index, only the lower section of the card shows, but as this part is at the bottom when filed vertically, the top part is needed for a future guide.

The use of numerals has several advantages over the alphabet, for when compiling statistics of all kinds, you have at a glance the number of claims made during any particular year, and taking out the cards for that year, they follow numerically, and therefore daily, monthly, etc. If, for instance, you want to figure out the number of train, one-man-car or bus accidents for a particular year, it becomes a simple addition. If they had been filed alphabetically, it would be necessary to keep other records showing those for the year 1926, etc., and sort them out. The same applies to every item shown in proper sequence on the card. Whatever statistics are required, and usually they are needed on short notice, the operation is simplicity itself, and the work of compiling can be intrusted to the least experienced clerk you have. The way I use the system I have an instant check on the progress of current claims or the past history of them, and, as the card shows, I can tell when a claim was filed, the investigator who has it, and how long.

How many cards are used per day?

Divide the number of claims received in a year by the number of days the office is open for business and you have the answer.

How is a no-report case located?

We call them blind cases. If for a claim, we give claim number, etc., following the same order as shown

						TO NUMBER		
FOLDER NO.	DATE OF ACCI.	CAR NO.	PLACE OF ACCIDENT		NAME			
ACCIDENT NO.	INCIDENT NO.	ADDRESS		INV. STARTED		BY NO.	INV. FINISHED	
REMARKS				LIST	STENO.	CLAIM AGENT	FILED AWAY	
FOLDER NO.	DATE OF ACCI.	CAR NO.	PLACE OF ACCIDENT		NAME			
ACCIDENT NO.	INCIDENT NO.	ADDRESS		INV. STARTED		BY NO	INV. FINISHED	
REMARKS				LIST	STENO.	CLAIM AGENT	FILED AWAY	
FOLDER NO.	DATE OF ACCI.	CAR NO.	PLACE OF ACCIDENT		NAME			
ACCIDENT NO.	INCIDENT NO.	ADDRESS		INV. STARTED		BY NO	INV. FINISHED	
REMARKS				LIST	STENO.	CLAIM AGENT	FILED AWAY	
FOLDER NO.	DATE OF ACCI.	CAR NO.	PLACE OF ACCIDENT		NAME			
ACCIDENT NO.	INCIDENT NO.	ADDRESS		INV. STARTED		BY NO.	INV. FINISHED	
REMARKS				LIST	STENO.	CLAIM AGENT	FILED AWAY	
FORM 194						TO NUMBER		

Report No. 194, on card 5x8 in., has also proved useful in indexing claims records

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on the card. Wherever possible, I interview the claimant personally at my office and retracing his movements minutely, I take a written version accordingly. If the party is unable to come, I send an investigator to secure the information. With this information, together with a full description of the car or crew, we locate cars for about 30 minutes before and after the time given. We then begin a systematic sifting or elimination until we narrow down the search to a few, and these men are then interviewed. With this procedure we rarely miss our objective. Once the crew has been located, versions are taken and we build up on the claim with whatever information we have, as in the ordinary claims.

If you have the date and location of an accident, but no name, how could you locate the report?

An accident book is kept containing enough pages to last a year (previously it was for six months). Each accident report is numbered and the salient facts as given on report are entered in the book. The numbers start from 1 at the beginning of each month. As many pages as needed are reserved for all accidents happening on that particular date. If we have the date, which is the quickest way to locate the report, with any other particular detail such as car number, location, name of conductor or motorman, or kind of accident, etc., all we have to do is open the accident book at the date mentioned and with one of the details just mentioned, the report is found at once by its number. Each report, being of foolscap size, is folded in four and filed upright in suitable steel filing cabinets and the number is seen at the top as in a card system. We also have "incident" books, arranged in the same way as for an accident book.

How is Form 194 (the incident card) used?

Four divisions will be noted on this form. As this form does not need as much information as the other card, I show four different cases on one card. The use of the divisions on the card, in their order, is as follows: "Folder No." This is for employees injured on duty. A folder or docket, large enough to hold a foolscap-size file, is prepared for each employee injured. On the face of the folder appears in condensed form all important details contained in the folder. "Date of acci." "Car No.," etc., do not need explanation, as the same scheme or follow-up is followed as with the claims card. It follows that Form 194 is used for anything not a claim. The argument may be advanced that, having four different cases on one card, the top or bottom one only would show in a filing cabinet. True, but it will be found in practice that incidents are of a temporary nature only, and once dealt with, it is necessary to refer to them again only on extremely rare occasions. Then we take the incident book and from it easily locate the card needed, since they are dated.

Form 193 carries two numbers. Is it first given an accident number and later a claim number?

No. I have just described the way in which the accident report book is kept. When a claim is filed against us, the card receives a claim number and the accident report being then taken out of its numerical place in the steel filing cabinet and an appropriate card being put in its place, the number of the report is entered on Form 193 at same time as claim number. Other details which can be taken from the accident report are added.

What distinction is made between "date claim started" and "date claim entered"?

Date claim entered means when or on what date the claim was filed by claimant. The other date is that when the investigator began his work on that claim.

Fifty Foremen Attend Conference

Course given twice a day during convention week. Representatives from companies in many parts of the country attend

AWAY from the rush and bustle of the main sessions of the convention, a group of men met for study in a room on the mezzanine floor of the Auditorium. They were the members of the Foreman Conference Leaders group, who were fitting themselves in the special course offered by the association committee on education to spread the lessons of better employee leadership to all parts of the country.

Intense interest was displayed by the men, according to H. H. Norris, educational adviser Boston Elevated Railway, one of those in charge of the course. Associated with Professor Norris were A. J. Sarre, superintendent of industrial relations New Orleans Public Service, Inc., and Frank Cushman, who is connected with the Federal Board for Vocational Education, Washington.

Registration for the course was limited to 50, and it was necessary to reject a number of applications so many companies wished to have representatives enrolled for the class. For the most part those taking the course were officials having under their supervision large groups of trainmen and other employees and directly in contact with personnel problems.

The class was divided into two groups, one meeting each morning and the other in the afternoons. The classes were open to the public on Friday, but the rest of the week the classes were secluded as if on a college campus, rather than within a few steps of the manifold activities of the convention.

The purpose of the course was to train the officials attending in the best methods of conducting conferences of their foremen, so as most effectively to transmit to them approved methods for training their men. The idea back of it all is that the trainmen and other workers are, in the last analysis, largely responsible for the success or failure of a company's efforts to give good service and to operate efficiently. To enable the workers to do their part, they must have the leadership of a capable supervisory force, and this supervisory force, or the foremen, must have real leaders among the executives directly over them. The course was designed to train the executives in order that they might conduct conferences of their foremen or supervisors in a way that would accomplish the results desired.

Not only did the officials receive many new ideas from those conducting the course and from each other but one of the most important elements of the training was the actual experience they had in conducting conferences. A part of each day's session was devoted to practice of this sort in which one or another of the officials conducted a conference and then received the benefit of the criticism of the others and of the instructors.

The wide interest in this new educational activity was shown also by the fact that a number of companies supplied literature for use in the course. This included instruction manuals, educational booklets, job analysis studies, etc., supplied by the Westinghouse Electric & Manufacturing Company, Boston Elevated Railway, New Orleans Public Service, Inc., Chicago, North Shore & Milwaukee Railroad, Milwaukee Electric Railway & Light Company and others.

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We Must and Will Go Forward*

The lessons of the past and present are being well learned, and the electric railway industry has profited by them. The electric railway man has reason to be proud of his job and can look to the future with confidence

By W. H. Sawyer
President American Electric Railway Association
President East St. Louis & Suburban Railway

SOME of you may not have had the occasion that I have had during this year to think in terms of the industry instead of in terms of a single property or even a group of properties. Out of that experience I have had a thrill, growing in magnitude and reaching a climax here today. I have gone over this exhibit during the past few days. If you haven't, don't miss the inspiration that it will give you. You will get a new viewpoint on your own industry. You will feel thoroughly, as I feel at this minute, the romance of transportation.

W. H. Sawyer

What a myriad of changes have taken place during the past 46 years! I shall not attempt to review them. But despite all of these changes and all of the difficulties which we have encountered, we are not a dead or decadent industry! We are demonstrating our ability to meet the changed conditions brought about by the advent of the private automobile. We are proving our assertion that our industry is still a most essential industry—necessary for civic advancement and prosperity. For generations it has been a major contributing factor in our wonderful national growth and advancement. It will continue as such. Public transportation must and will go forward.

We are making progress in the program of modernizing our cars and equipment to meet the demands of this luxury-loving, fast-spending age. It needs but an inspection of this car exhibit to testify most eloquently to the truth of this statement. But we are carrying forward more than merely a program of modernizing our cars. We are carrying forward a program of modernizing our thought and our methods.

We have every right to be proud of what we have accomplished. But I say to you—and mark well these words—we have but taken a forward step. Our job is far from complete. There never was a time in the history of the industry when there was a greater demand for skill, energy and ability to carry out the task which we have only well started.

Who is there among us that has exhausted the possibilities for giving better service? I do not mean "give" in the sense of a donation. I mean it in the sense of improvement designed to bring a return, both in the form of increased patronage and in the form of public good will. I mean it in the sense of the service which a far-sighted, progressive merchant gives the customer with whom he does business. I mean it in the sense of service which is good business.

I am, of course, fully aware that some of our electric railway lines that are now operating will eventually be scrapped. One of our immediate problems is to determine which lines do not have the potential earning possibilities to justify rehabilitation. Those that cannot be made profitable must in the very nature of things be abandoned. I fully realize our duty to our community to continue service, but we also have a duty to our investors, and, moreover, unprofitable service will eventually be a liability instead of an asset to the community. Those lines which are to survive must be modernized. It requires rare courage and foresight to determine just which lines are to be eliminated. But the decision must be made, and made quickly; otherwise the entire property will continue to degenerate at a cumulative rate. The job of rehabilitating those lines which are economically justified is far from complete. There is no room today for a discussion of the necessity of clean cars and polite and courteous trainmen. There is no longer room for

**Abstract of presidential address at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Oct. 3 to 7, 1927.*

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discussion regarding the need for advertising as a medium for giving our communities the facts of our business.

All this, however, is not enough. I believe that we are on the verge of fundamental and basic changes in the character of our service and of the equipment with which it is given. I have referred before to the quantity and quality of our exhibits, but this year as never before we have concrete examples of unmistakable advances in the art. I refer particularly to some six or eight exhibits among the modernized cars on the outdoor track. Some of these developments are largely experimental, in that they represent radical departures from established practice. But I believe that these changes are only forerunners of a definite trend of new developments out of which will come improved facilities that are essential to us in rendering a character of service that will meet the conditions which exist today.

Let me bring to your mind another thought here. Development such as is represented by these particular exhibits costs real money. Somebody believes in us. Somebody has faith in the electric railway industry. Somebody is willing from a hard-headed business viewpoint to spend money to demonstrate that the street car is still the most efficient passenger-carrying vehicle on the streets and can provide a class of service which will meet the tastes of an automobile-educated public. I take my hat off to those manufacturers and operators whose equipment is out there on display today. I feel confident that only a few years from now we shall look back on them as real pioneers who started us on a new period and a new era.

Even now I am willing to prophesy that the year 1927 will stand out as a year in which officially we took notice of another changed condition, and so revised our constitution as to bring it up to date. We shall still retain the name American Electric Railway Association; that is probably justified, because the electric railway still remains and will remain the backbone, the foundation stone, if you please, of the local transportation business. We shall, however, by the changes proposed in the constitution of this association, rightfully identify ourselves, not as electric railway men only, not as bus men, but as transportation men qualified to serve our communities with whatever form of transportation best fits its needs in each special situation.

There has come about in 1927 not only additional progress in the co-ordination of the bus and the electric railway car but further and more definite co-operation between the bus manufacturers and the industry. We have not yet taken full advantage of the bus and have by no means fully co-ordinated it with the electric car.

The day of the bus as a fad is gone. Some of the buses now in operation are unnecessary. The bus cannot and must not compete for the same business in the same territory with the electric car. That is inefficient and is a waste of the rider's money. High-pressure methods of salesmanship and overenthusiastic statements of fact have been detrimental to the sound development of the bus as a responsible transportation agency. But I see new developments ahead in the application of the bus as a transportation vehicle, whereby it will expand its present usefulness.

The relations which exist at any particular time between our companies and our communities are a measure of the condition of the transportation business. On the relations which exist between them and on their ability to understand each other's viewpoint and problems depend the success of the partnership which is thus effected. Two factors are directly influenced by the nature of the relations which exist between these two principal interested parties—namely, the character of the service which it is possible to maintain and the cost of giving that service.

During the last few years there has been a marked change in public opinion regarding the relative importance of these two factors. Although the memory of the old 5-cent fare which was exploited so many years by politicians still remains in some cities, much more consideration is being given today to the matter of service and less to the maintenance of a fixed or lower fare.

WE ARE carrying forward more than merely a program of modernizing our cars. We are carrying forward a program of modernizing our thought and our methods.

Our record entitles us to ask for and to receive the co-operation of the communities we serve. We are making progress, but we could move faster if our communities better understood our problems.

Nothing has been found to take the place of the electrically-propelled rail-borne car for moving masses of people rapidly and efficiently.

EXCERPTS FROM MR. SAWYER'S ADDRESS

There is an ever-increasing appreciation of the fact that if desirable service is to be maintained, the company must be permitted to develop a financially healthy condition. Our industry is making an honest and determined effort to give better service at the lowest practicable price consistent with such service. I am confident that no community wishes to deprive itself of the advantage of such improvement to save an additional cent or two, particularly when the cost of the street-car ride is compared with that of its principal competitor, the privately owned machine.

The automobile has provided pleasure and recreation to millions of people. Its manufacture has become one of our largest industries and has contributed materially to the prosperity of the country. The automobile is, in part at least, responsible for the prosperous conditions of today. But I wonder how many of our city officials really appreciate the comparative transportation economies of the automobile and the street car. Many traffic checks in various cities have shown that the average passenger load in automobiles is less than 1.8 passengers per vehicle. The average street car carries ten or more times that number. The street car is a conserver of expensive street space, while the increased use of automobiles is dependent on making available additional street capacity at the expense of the community. In solving their traffic problems many cities are taking cognizance of these facts and are assisting in increasing the speed of the electric cars by giving them the right of way wherever practicable, thus catering to the majority without detriment to the minority.

The changed conditions of today do not admit of our industry carrying the burdens of the past. We can no longer be used as tax gatherers. Many progressive communities have eliminated the unjust and unfair paving

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tax, and rightfully so for the benefit of the community. There is an increasing appreciation that it is unfair to ask the car rider, who in the last analysis pays the cost, to have any considerable part of his carfare represent a tax levied by the community. Electric railways have in the past paid an unfair property tax. Capital invested in a utility is turned over very slowly in comparison with many manufacturing or commercial enterprises, which frequently turn their capital several times a year. Nevertheless the tax rate on transportation property is maintained at rates very much out of proportion to this situation.

The continued improvement of public transportation service is dependent on permitting the investor in these properties to make a fair return on a fair value. There are but few electric railway companies doing that today, and that is why we must have even greater co-operation on the part of our public to discharge more effectively our full responsibility as public servants. We are no longer asking for sympathy. We believe that our record entitles us to ask for and to receive the co-operation of the communities that we serve. We are making progress, but we could move faster if our communities better understood our problems.

Frankness compels the statement that there is always a minority who do not want to understand the facts of the transportation problem and whose selfish interests are served best by trying to make the American public think it can get something for nothing by squeezing the life out of the transportation companies. The fable of the goose that laid the golden egg has a direct application in the transportation situation. The fact that the public is beginning to understand the truth today is largely attributable to the frank and effective way in which many companies have told their story through local newspaper and other advertising. I do not believe there is a man or a company in the industry who is doing too much in this direction. There is still room for an even better and more effective job.

And so, to summarize, conditions of today are different from those under which we built and learned to operate electric railways. The methods of the past are no longer effective. The solution of our many problems requires experts—specialists.

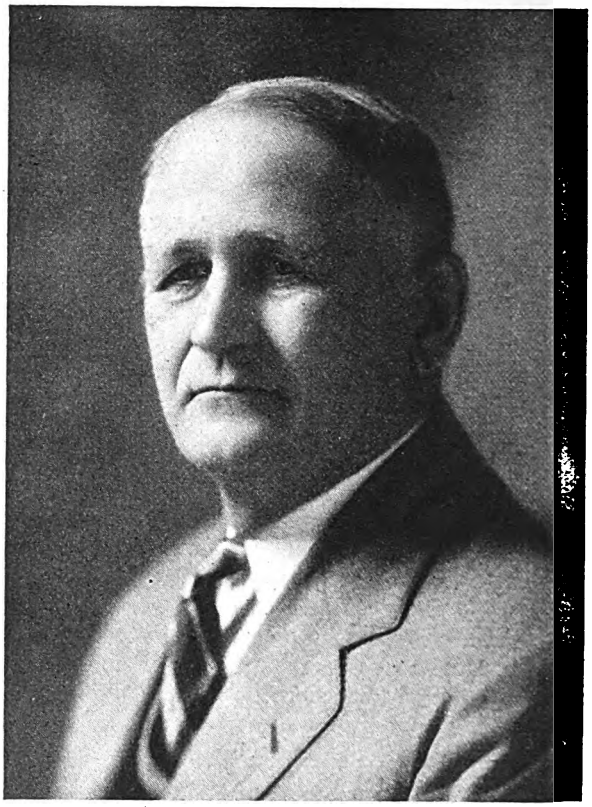
With the coming of this new day, our eyes are turned to the front and there is courage and hope in our hearts. Despite all of our difficulties, one incontrovertible fact stands out above everything else: The very life and progress of modern communities require adequate and efficient public transportation. In the foundation-shaking test to which present transportation agencies have been subjected, nothing has been found to take the place of the electrically propelled rail-borne car for moving masses of people rapidly and efficiently.

Transportation is a vital community requirement. The roots of our industry are buried deep in the foundation of community prosperity and growth. We have cause to be proud of our jobs and have every reason for throwing our spirit and our energy into the work of keeping abreast with the march of progress. Conditions are changing—yes, changing, not yearly or monthly, but daily. We are public servants in the true sense of the term. By dedicating ourselves to the community's interests, we aspire to that greatest of achievements—the service of mankind. The electric railway industry must and will go forward!

Getting the Most Out of

Public Utility Regulation*

By W. W. Potter
Attorney-General State of Michigan, Lansing, Mich.



W. W. Potter

The author traces the development of utility regulation and shows that it can be of great benefit to the utility. The electric railway, by giving the right kind of service, will have little difficulty with regulatory bodies

WHEN the balance of power and population in the United States passed from rural communities to the cities and villages, public utility problems became important. Public utility securities at that time were not regarded as sound investments, and few of them had the confidence of the general public. They were generally local in character, and in dealing with the several cities their promoters were confronted with the uncertainty of success, the question of public patronage, doubt as to the ultimate growth of the cities themselves, the crudeness of the art and excessive costs of construc-

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tion. As a result of the general lack of scientific knowledge in relation to public utility problems, promoters provided for high franchise rates to be paid by the public in order to insure as far as possible the integrity of their original investment.

When prices fell in the United States during the early '90s, operating methods had been greatly improved and operating costs fell to a much lower level than ever before. Many public utilities insisted upon maintaining their franchise rates and capitalized, through application of water, the difference between the fair return on the fair value of the investment in the utility and the amount of income realized from the franchise rates.

The Granger cases marked the first successful assault by the general public upon what had been regarded as the sacredness of public utility franchise contracts. The rule became firmly established in the jurisprudence of the United States that when property was invested in a business charged with a public interest, it must submit to public regulation. Outside the ranks of the owners and operators of public utilities, thinking men became interested. Reasonable men everywhere recognized that rate-fixing franchises had usually been given to the utilities without consideration.

Some intelligent method was demanded to handle the ever-recurring problems resulting from the conflict of interest between the utilities and the public, and public utility commissions were called into existence as a means by which the solution of these vexatious problems might be solved. Notwithstanding all of the opposition to the creation of public service commissions, they were finally created, and with them in many cases came rate reductions. Simultaneously the conditions of operation radically changed and public utilities rose to a new standard.

With this growth and development of the scope of operation and with state regulation there has grown up a more tolerant spirit toward the regulatory bodies of the state. There always have been and probably always will be divergent views of public utility regulation. On the one hand there are those who believe that the public service commissions should prescribe with great detail the manner in which the business of the public utility corporations should be carried on. On the other hand there are those who believe that the owners of a public utility should have a right to carry on the business with the least possible interference from public authorities.

Attitude of Utilities to the Public

One of the things which public utilities should seek to avoid is being crucified by their own anxiety to obtain rates in excess of a fair return upon the fair value of their used and useful property. Smythe vs. Ames, in which the rule was first authoritatively laid down that a public utility was entitled to a fair return upon the fair present value of its property, was argued before the Supreme Court of the United States.

Some courts have held that reproduction cost new constitutes the dominant factor in the determination of the present fair value of property, but this method seems unfair to both the public and the utility investors.

Nothing has weakened the confidence of the investing public in the securities of public utilities in the past more than has watered stock. Non-existent overheads, the cost of hypothetical superintendence of unknown labor, added percentages for imaginary errors and omissions are all methods of adding fictitious value. How much more satisfactory it would be to all concerned if in rate proceedings, instead of furnishing volumes of testimony about fanciful intangibles, a fair present value could be agreed upon which would be available to the public or to the regulatory body. If the securities of public utility companies have back of them appropriate tangible assets, they will command public confidence.

The public is very apt to oppose any demand for an increase in the rates paid for transportation on street railways, but if the service is bettered, it is willing to pay for it. Subnormal operation never yet was entitled to abnormal rates. The public cares little or nothing for the question of original cost, fair value, reproduction cost new less depreciation, or any other befogging data, but it is interested in good service. If the street railways make an intelligent effort to render better service, it seems that they will receive the aid of the public and the questions of rates and revenues will take care of themselves.

One of the ways the public can help the street car companies is by relieving them of the burden of paving between their tracks, enabling the companies to improve their service.

It is contended by many that the street car is passing. However, a recent investigation revealed that last year the street railways carried more passengers than ever before. It is the most safe and economical means of transportation yet developed.

Public Utility Regulation Here to Stay

"Customer ownership" is one of the things that will make for better public relations. Public utility investments are safe and satisfactory to the customers, and in addition to creating a better public sentiment, substitute co-operation between the customer and the utility. Public utility regulation is here to stay and fighting it is effort poorly spent.

There has been a tendency in the last few years to make public utilities a means whereby a large amount of money might be raised for taxation. The street railway is assessed supposedly at the true cash value of all its real and personal property, the same as other property assessed upon an ad valorem basis. It pays its proper proportion of the highway taxes levied in the several communities in which it is assessed, and it has to stand by and see this money, paid by it through taxation, expended in the construction of hard-surfaced highways paralleling its lines, which tend to build up and strengthen competition to its own business.

The time is not far distant when these utilities which for the past ten or fifteen years have had hard times in many ways will be taken in hand, rehabilitated, their securities rendered more valuable and the revenue made sufficient to pay operating costs and a fair return upon the fair value of their property. Such adjustments may easily be made, and not only will insure the continuity of the service but will also make the service sufficiently attractive to the public actually to increase its riding habit.

If the street car companies admit they are dead, there is no reason why they ought not to be buried. The street railway, like everything else, must keep abreast of the times or fall into the discard. If the service furnished is courteous, rapid and safe, it will be patronized and profitable, and regulatory bodies will not have to spend time wresting with its problems.

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Reducing Delays

to Street Car Traffic*

By Miller McClintock

Director Albert Russel Erskine Bureau for Street Traffic Research, Harvard University

CONFLICTS between rail and rubber-tired vehicles in the traffic stream are more apparent than real. The aim of sound traffic control should be the adjustment of these difficulties so that a minimum of conflict will result.

Any approach to the problem of traffic regulation which is predicated on an elimination of either rail or rubber-tired vehicles or which is based on a policy of arbitrary restriction or oppression of either group is predestined to failure. Motorists can gain no advantage on streets where street cars are blocked. Traction operators can find nothing but embarrassment on arteries of travel where restrictive legislation and arbitrary enforcement have resulted in automobile congestion. Both motorists and car riders have the common desire to move and to move with safety and convenience. On our saturated city streets this common aim can be attained only when each is willing to submit to reasonable control.

Dr. Miller McClintock

In the consideration of any street traffic problem, guesswork and opinion can be of little assistance. When all American cities recognize the street traffic problem as one requiring sound and continuing engineering consideration, much more rapid progress will be made.

A study of street-railway operation in Los Angeles in relation to general traffic conditions was conducted last month. The checks were made covering all of the principal lines operating in the central congested district, approximately one mile square with a daily entering traffic of 9,000 street cars and 200,000 motor vehicles. Results are summarized in an accompanying table. The average speed while in motion was 10.2 m.p.h. but, due to delays, the average over-all speed was reduced to 6.3 m.p.h.

Delays due to vehicular traffic on tracks cause a maximum feeling of irritation to the traction operator. The Los Angeles study indicated that this factor accounts for 5.4 per cent of the total delay. This figure is far below that anticipated, and it is believed that similar studies in other cities will indicate more favorable conditions than those estimated through casual observation.

There is obviously no perfect remedy on densely crowded streets for this type of obstruction. Had the present saturation been anticipated, streets would have been so designed as to permit a curbed-in right-of-way for traction lines and thus for an elimination of interference. This is a practice now being followed in many new developments throughout the country and deserves the fullest consideration. It is, of course, a remedy which cannot be contemplated in the crowded streets of central districts.

The attempt that has been made in a number of cities definitely to prohibit the operation of motor cars on street-car tracks along crowded thoroughfares is one which, to my knowledge, has never been successful and has resulted only in irritation and opposition. The motoring public inevitably feels that at least between the times when street cars actually utilize the roadway occupied by their tracks the space should remain available for any legitimate traffic purpose. The same objection is not felt where roadways are wide enough to accommodate the full flow of vehicular traffic in addition to the street-car load, but under such conditions there is little need for the prohibition.

The most logical regulation for a relief for the conflicts between street cars and the vehicular traffic stream is to be found in the provision now generally incorporated in city traffic ordinances which provides a right-of-way for street cars along their own tracks. It is expressed in the uniform ordinance for California cities in the following words: "It shall be unlawful for the operator of any vehicle proceeding upon any street-car track in front of a street car to fail to remove said vehicle from said track as soon as practicable after signal from the operator of the street car." This provision, adequately

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enforced, protects the street car from unreasonable "dragging" by preceding vehicles.

A further type of vehicular interference is to be found in the standing of vehicles on the track to the left of passenger loading zones while awaiting release at the adjacent intersection. The orthodox solution for this difficulty is to require all vehicles to pass to the right of such zones, on the presumption that this rule will always make it possible for street cars to reach the loading berth over a clear track. This is undoubtedly a desirable rule on streets with a roadway of adequate width to carry the full load of vehicular traffic without the use of track space.

Where vehicular traffic is too heavy to be accommodated in the off-track space available, it should be pointed out that the rule generally has more serious effects upon traction operation than no rule at all. The space to the right of the passenger loading zone is generally less than the traffic space to the midblock. An attempt to crowd a heavy vehicular flow into this bottle neck often makes it impossible for some vehicles to clear the track. The result is that obstruction to the street car is merely transferred from a point near the loading berth to a point farther back, where it may be even more serious to operations. Indeed, it is not unusual to see this type of obstruction extend its effect back to the next intersection, interfering with cross traffic at that point.

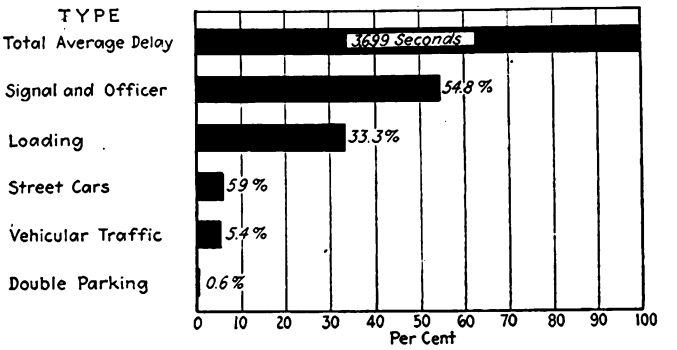
CAUSES OF DELAYS ON STREET CAR LINES IN LOS ANGELES

	Per Cent		Per Cent
Signal and officer	54.8	Vehicular traffic	5.4
Loading	33.3	Double parking	0.6
Other street cars	5.9		
			100.0

The traffic condition that is most generally accused of contributing the principal delay to street-car operation is parking. For consideration here, parking may be divided into two types: First, parking along the curb, and second, double-line parking. It is apparent that curb parking has little effect upon street-car operation except on streets with roadways so narrow that automobiles so parked obstruct the overhang of the street car. Under such conditions it is clear that parking, and even the standing of vehicles for loading and unloading, must be entirely abolished, or street-car operation abandoned.

On streets where the roadway is so narrow that there is not room for the operation of a line of automobile traffic between the street car and parked machines, it would at first appear that prohibited parking would immediately result in improved traction operation. Undoubtedly some relief would be obtained, but not to the degree frequently expected. Even with time-limit parking prohibited, provision must still be made for the loading and unloading of passengers and merchandise. Under normal traffic conditions in typical cities, this requirement will generally result in at least one such loading vehicle being found in each block. In other words, the amount of vehicular operation along the car tracks will not be substantially reduced, inasmuch as drivers will not permit themselves to be "boxed" in the lane of traffic nearest to the curb.

Such operating advantages as may come from prohibited parking are to be found primarily in the elimination of the necessity for what may be called double-line parking, which, on all streets except those of unusual width, results in a blocking of traction movement. Where time-



Segregation of total average delays observed on twelve street car lines in the central traffic district of Los Angeles by the Traffic Commission of the City and County of Los Angeles

limit parking is prohibited, double-line parking becomes unnecessary, due to the free curb space which is made available for loading and unloading activities. The question naturally arises as to whether it is possible to accommodate loading and unloading operations of vehicles without going to the extent of entirely prohibiting time-limit standing of vehicles. Except in the more congested American cities where a great percentage of the traffic is of a commercial character, it is believed that this end can be obtained by means of a regulation which has come to be known as the loading-zone rule—that is, an ordinance provision which makes possible the reservation of adequate curb space conveniently located in each block, which may be used exclusively by vehicles which are loading or unloading passengers or merchandise. This regulation has proved its effectiveness in eliminating the necessity for double-line standing. Attention is called to the accompanying illustration, indicating that the recent Los Angeles survey revealed that only 0.6 per cent of the total delay time could be attributed to parking which overhung the car clearance line.

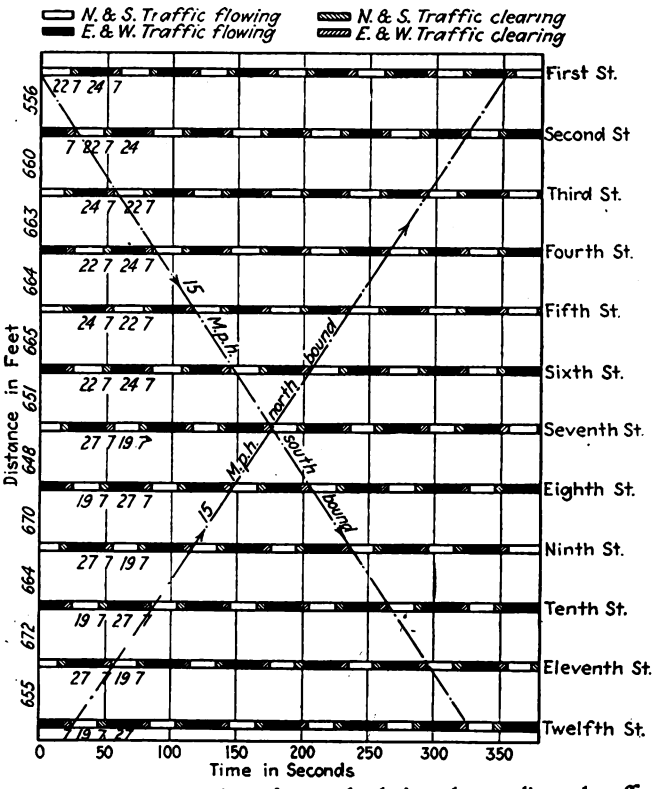


Chart showing operation of recently designed co-ordinated traffic signal system for Los Angeles

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Obviously, this delay is so small as to be practically negligible. Yet three years ago a similar study indicated that 10 per cent of all parked vehicles in the central district was standing in double line, causing constant blocks and delays to traction operation. The practical elimination of this delay factor was due to a loading-zone provision incorporated in the traffic ordinance which permits the reservation of as much as 50 per cent of the entire curb space of any block for the use of vehicles during loading and unloading operations. It is needless to say that the regulation has proved of as much benefit to the general motoring public, and especially to the commercial operators of the city, as it has to the street-railway company. A similar provision has been incorporated in the Chicago Traffic Ordinance and the ordinance recently drafted for San Francisco. With double line parking eliminated, the street car operator need have little further consideration regarding parking as a delay factor, except upon streets where curb parking interferes with street car clearance.

Delay Due to Overloaded Lines

The delay due to overloaded lines is that which results from street cars offering obstruction to those following, due to overloaded lines or other operating conditions. It is one that does not result from general traffic conditions, but from operating conditions of the lines themselves. Observation leads to the belief that there is in American cities altogether too much of what may be called traditional street-car routing—that is, routes which are followed at the present time primarily because of antiquated habits on the part of the car riders and of merchants located along the lines. Recent routing studies have indicated the possibility of more evenly distributing some of the acute loads which are borne by lines at the present time and at the same time giving more economical and efficient service to the public. Any movement of this sort is a benefit not only to the traction company itself but likewise to the general traffic problem. From the standpoint of traffic relief, special attention should be given, in rerouting studies, to the possibility of eliminating right and left turns at congested intersections.

At Los Angeles 33.3 per cent of the total stopping time was attributed to loading. Methods for reducing loading time are so well known that any discussion of them is needless here. The use of raised platform zones, ground conductors, suitable car design and improved fare collection systems are all important. Observation leads to the belief that in many American cities at present much time could be saved by the use of better methods. The traction companies owe it not only to themselves but to the operators of vehicular traffic to keep their cars standing for the least possible time consistent with efficient loading. A common view of a street car at a congested intersection with a long queue of passengers boarding laboriously through a single entrance, making change and paying their fare, raises a pertinent question as to whether there is some more effective method of transacting this business. The pay-as-you-leave system as a substitute for prepayment is one which would appear to be a not illogical change under many conditions.

The efficiency of any traffic control system depends largely on its ability to maintain the intersection delay at a minimum. Reference to the Los Angeles table, shown herewith, shows that 54.8 per cent of the total delay can be attributed to waiting for a "go" signal after the loading and unloading business has been completed. This amount of delay seems entirely out of proportion when it is recalled that it exceeds the combined delay resulting from loading and all traffic interferences. Excessive delay from stop and go apparatus will be inevitable in all American cities until the controlling devices are properly co-ordinated and adjusted in timing to meet the traffic loads which the streets carry. What can be accomplished by a properly designed system of co-ordinated control is best illustrated in the Loop district of Chicago, where a co-ordinated system of signals operating under progressive timing has reduced control delay to a minimum and has resulted in a marked improvement in traffic conditions, from the standpoint of both traction and free wheel operation. E. J. McIlraith, staff engineer of the Chicago Surface Lines, is primarily responsible for the excellent design and functioning of this system. As an illustration of what may be accomplished by proper signal co-ordination, an accompanying chart shows the operation of a recently designed system for Los Angeles.

One of the most serious traffic conditions that confront traction operation, and indeed vehicular operation as well, at the present time is what may be called overcontrol. There appears to be a tendency to conclude that a traffic stop and go signal is a panacea for all traffic ills. One sees devices installed at hundreds of intersections in American cities where traffic demands do not warrant control of any type. Traffic signals properly used offer one of the brightest hopes for effective regulation, but misused they can have nothing but serious effects. No signal should be installed at any intersection until a study has indicated that its operation will reduce rather than increase congestion.

WHAT can be accomplished by a properly designed system of co-ordinated control is best illustrated in the Loop district of Chicago, where a co-ordinated system of signals operating under progressive timing has reduced control delay to a minimum and has resulted in a marked improvement in traffic conditions, from the standpoint of both traction and free wheel operation.

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The Ten-Year Budget*

Electric Railways Must Plan for Years Rather than Months

By George E. Frazer

Frazer & Torbet
Certified Public Accountants
Chicago, Ill.

IN EVERY one of its branches the public utility business is preeminently a long-term business. Although certain factors have led to a great emphasis in accounting and reporting by daily and monthly periods, it is well to remind ourselves that we are in a business that of necessity covers long periods.

Every electric railway has on its books a long-term budget expressed in its capitalization. The first problem that confronts the management of an electric railway every morning is the recurring problem of fixed charges on capital. Often such fixed charges are in excess of the net income that can reasonably be estimated. There is the constant temptation before the manager of electric railways so situated to impoverish service and with forced savings from operating necessities build up sums required for interest and dividend payments. It is to the everlasting credit of your industry that this temptation, while daily recurring, is being constantly withstood in order that the public may be served first.

Ranking equally in importance with the long-term budget of capital charges is, of course, the long-term budget of capital expenditures. Let me remind you that a budget is a balance. It is a misnomer to speak of a capital expenditure budget if it is nothing but an estimate of the sums that the engineering department of your street railway would like to spend for capital account during each of, say, the next ten years. Opposed to the list of capital expenditures in sub-total and in grand total there must be a statement of proposed capital available out of which the expenditures can be met.

The long-term budget of capital expenditures leads logically to the long-term budget of capital charges. Here, again, it is idle to make a one-sided budget that merely shows the demand of capital charges that it is estimated will occur each year for a long-term period. Opposite to that demand, and balancing with it, there must be a statement of estimated income available for capital charges. Nor can we break our chain of logic at this point. We must relentlessly set down a third long-term budget. On the one hand we must state the estimate of net income that is required for capital charges and against that estimate we must state the estimated gross revenue, less expenses, that produced the net income. Lest it be said that I am getting into the realm of the higher mysticism at this point I must insist that it is possible to estimate the gross income of an electric railway for a number of years in advance, and it is possible to make this estimate with a reasonable degree of accuracy. Such estimates have been successfully made and can be successfully made, because there are more factors which can be predetermined than there are unknown factors, and because the work of the accountants, statisticians and engineers can be, and should be, tempered by the mature judgment of executives. The priceless ingredient in a long-term budget is the mature judgment of executive leadership that conservatively analyzes the figures and temperately sets down results which are obtainable and in practically all instances will be exceeded. Such figures may be of poor quality if intended for use in selling an electric railway, but should be of exactly the character I have described if they are to be used in planning ahead the successful operation of an electric railway over a term of years.

Long-Term Budgets Should Be Set Up

Certainly experience has shown that setting up long-term budgets often results in disappointing figures that must be faced if long-term success is to be had. If the capital expenditure budget for the next ten years in

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your company results in a budget of capital charges for the next ten years that demands net income for that long-term period in excess of what the net income can conservatively be estimated, then you have very striking proof of the necessity for long-term thinking. Similarly, a disappointing long-term budget may, and often does, call attention to the necessity for cuts in operating expenses. If the long-term budget shows that present wage rates cannot be maintained, that showing of itself may stiffen the backbone of the management in insisting upon wage rates that can be lived with. It is easy to give in to solutions which make peace for today. In fact, it is altogether too easy to do that in making wage settlements where long-term budgets are not on the desks of the management compelling long-term thinking. And, of course, the long-term budget does play hob with extravagance in overhead expense accounts.

The trilogy of long-term budgets in the case of an electric railway company always emphasizes that present capital charges are so high that it is difficult to add new capital charges made necessary by needed capital expenditures. The temporary solution of some companies has been to forego current capital expenditures, with the result that service has suffered and gross revenues have declined. It is sometimes almost too easy to explain such decline of gross revenues as due to automobile competition. On each successful electric railway in the country the capital expenditures have resulted in improved service and that improved service has resulted in a sufficient increase of gross revenue to meet the capital charges arising out of the capital expenditures. To the degree that this statement is true, it follows in severe logic that the increase in capital charges is more important than the old capital charges, and that the increase in capital charges if necessary must be made, even though the old capital charges are summarily decreased.

The long-term budget tends to bring up the question of recapitalization. To my mind that is the virtue of setting up a long-term budget. Many electric railway companies in the country need recapitalization in order that present capital charges may be reduced to a point where new capital charges can be increased. Without this process the present capital charges themselves are doubtfully secured. Let me add that public financing has demonstrated that the public will buy new securities on an electric railway when satisfied that the old capital charges and new capital charges make a sum total that can be conservatively met.

A long-term budget starts with an estimate of capital expenditures for a period of years. Such an estimate brings into sharp relief the varying degrees of productivity of the properties owned by the electric railway company. If the electric railway company owns power plants and transmission lines which need improvement and betterment, it may be found practicable and desirable for a reorganization of the company to proceed under which such power plants and transmission lines are sold to electric light and power companies which, through more constant use, can better afford to pay for their renewal and expansion. Under this process, the electric railway company can secure power by lease and at the same time avoid capital expenditures which it is not in an economic position to finance.

It must not be understood that the sale of the power plants and transmission lines is indicated in all cases by merely setting up a long-term budget. Quite the contrary may result. The long-term budget may show that a great deal of capital must be spent on power plants and transmission lines and that the electric railway company must find an outlet for power in order to justify such a plant program.

The point that I am making is that the long-term budget compels the balancing of capital expenditures with capital charges in the first place, the balancing of capital charges with net income in the second place, and the balancing of net income against predetermined operating conditions in the third place. Where these three judgments are made over a period of ten years in the case of an electric railway property, there is bound to be an intensive study of the revenue-producing qualities of the assets of the electric railway. If the electric railway company owns freight lines or power houses or transmission lines or terminals that it cannot properly finance and develop, then the long-term budget will suggest the sale of these facilities to other public utilities, with advantageous leases back to the electric railway company. On the other hand, if the facilities owned by the electric railway company are capable of expansion where power or service can be sold by it to other utilities, then the long-term budget will suggest that possibility.

What I have desired to do is to call your attention to the following principles:

1. The electric railway business must be planned in units of five years or ten years rather than in units of this day or this month.

2. The electric railway business is a fundamental part of the transportation system of the country and, as such, is bound to grow and develop.

3. Each electric railway company must spend large sums on capital additions or else suffer losses in gross revenue and jeopardize present capital charges.

4. The proper budget of capital expenditures must be balanced against new capital required to make the expenditures.

5. This leads to the second budget of capital charges, both present charges and new capital charges as against probable net income during the life of the capital charges.

6. This consideration of capital charges may lead to a reorganization of present capital structure in order to secure a basis that will support the required capital structure.

7. The second budget of capital charges leads to a third budget of estimated net income as against gross revenues and expenses.

8. This long-term operating budget draws particular and intensive study to revenue-producing capacity of present and proposed assets, possibilities of increasing gross revenue and decreasing expenses through economies in plant betterments and better supervision, long-term consideration of wage levels and long-term consideration of overhead expense accounts.

9. The three long-term budgets taken as one long-term program inevitably lead to a study of the advantages of disposing of such power plants, transmission lines, terminal facilities, and the like, as can be used to better advantage by electric light and power companies than they are now being used by the electric railway company; rehabilitation of the electric railway to put it in a position to sell power to steam lines for electrification of their metropolitan services, and use of electric railways themselves in hauling city freight deliveries so as to reduce vehicular traffic congestion in the city streets.

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Obtaining Capital
for Electric Railways*

By Francis H. Sisson
Vice-President Guaranty Trust Company of New York

Francis H. Sisson

TO ATTRACT capital, any industry must be able to demonstrate its fundamental economic soundness—that is, its capacity to produce the better-than-any-other-agency goods or services for which there is every prospect of continued and enduring demand. From the standpoint of this basic requirement, the electric railway industry, at least in so far as it pertains to transportation in large centers of population, has abundantly proved its right to share in the investment fund of the country. Within the past ten or fifteen years several rival methods of transportation have been developed and tested, but none has proved capable of handling mass passenger traffic as cheaply and as effectively as the street railway. First there came, in the period before the war, the jitney, which, unregulated and irresponsible as it was, soon passed from the scene. During the war the electric railways were weakened by the rapid rise in operating costs, and since its close they have had, in their weakened condition, to face the widespread development of the motor bus as a transportation agency and also the rapid multiplication and diffusion of the private automobile among all classes. Out of the experience derived from this intense struggle for existence of rival means of transportation has come the definite conviction that, for the economic handling of passengers in mass in our cities, nothing has been developed which can take the place of electric cars running on steel rails.

It has become self-evident from the congestion in our streets that the private automobile is incapable of handling the large volumes of traffic which daily flow to and from the business centers of our cities. As the congestion increases, owners find that they cannot by using their automobiles save sufficient time over street car schedules to justify the very substantial additional expense involved. They are also deterred by the vexation and dangers of driving in crowded traffic and the difficulty of finding parking spaces in the vicinity of their destinations. It seems likely that further multiplication of automobiles will have little adverse effect on the volume of traffic carried by street cars in rush-hour periods in large cities, although there may be some resulting further decrease in riding during off-peak hours and on Sundays.

While the private automobile has not displaced the street car, it has admittedly modified to a profound extent the conditions under which street cars operate. For one thing, the speed of street cars has been reduced by the congestion which the automobile has produced. Another change has been the lowering of average volumes of street railway traffic as compared with peak volumes. Both of these alterations in conditions have made for increased unit operating costs on the railways. These changes, however, are of the technical variety. Broadly speaking, the most significant modification has been that of the electric railway industry from a monopolistic to a competitive business. No longer can the railways depend on traffic which comes to them as a matter of course; instead, they must adapt their operations and equipment to attract traffic.

These adverse changes in operating conditions for street cars, however, have been counterbalanced by even more adverse changes in the conditions affecting the use of automobiles and consequently have not shaken the conclusion that the electric railway industry in large centers of population is as a business economically sound. As this judgment respecting the permanence of street railways comes to be shared by investors generally, the difficulties in the way of railway financing should become much more easily surmountable.

At present, however, despite the soundness of the railway business as an economic activity, many railway companies are hard pressed to obtain additional capital for their needs. The main reasons for the plight of these companies are unsatisfactory franchises and contractual relations, top-heavy indebtedness and fixed charges, closed or otherwise inflexible mortgages and in some instances competition from other public transportation agencies, unfavorable political conditions, unsatisfactory public relations and lack of alert and efficient management.

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Speaking very generally, the inability of these companies to do financing is due to the fact that the essentially sound business which they conduct is not clothed in sound legal and corporate forms. For the most part the existing inadequate forms which retard and prevent financing are not creations of present managements, but are rather legacies from a past in which conditions were utterly different.

Among the most common difficulties encountered in franchises are insufficient term or tenure of life and lack of flexibility in respect to fares. Either one of these conditions makes financing well nigh impossible, and a combination of the two is usually fatal. Fortunately municipal authorities and the public in general have in a number of instances been brought to see the folly of inflexible provisions in these matters, and old iron-clad franchises have been superseded by others having the flexibility that investors demand.

Unless state laws prevent, franchises should be for an unlimited or independent period, or else there should be some provision for the amortization or reduction of debt within the period of the franchise. Several states have commendable indeterminate franchise laws whereby public utilities are assured of the continuing right to operate their properties unless and until the municipalities within which the properties are located elect to purchase them at their fair value. Other states should follow suit and rid their statute books of archaic franchise laws. Where franchises must be for definite terms, the necessity for amortizing debt within the life of the franchise may be obviated if a provision is incorporated obligating the municipality to take over the property at its fair value in case the franchise is not renewed.

WITH favorable conditions in respect to franchises and corporate structure must be coupled the assurance of alert and vigorous management, for not even the best set-up as to franchises and capital issues will atone for visionless and inefficient supervision.

—FRANCIS H. SISSON.

FRANCHISES SHOULD PROVIDE FLEXIBLE FARE

Unless the regulations of fares falls within the province of some state-wide agency, there should be machinery within the franchise itself whereby the raising and lowering of fares to meet fluctuating costs is accomplished automatically and without reference to any local political body. A number of admirable "service-at-cost" franchises embodying this principle have been worked out. In such franchises changes in fares usually are regulated by a barometer fund into which go all earnings above expenses and a stipulated return on capital. The only serious criticism which may be made of such franchises—and that mainly from the standpoint of the common stock holders—is that the incentive to the management to accomplish savings in operation is somewhat dulled, since such savings redound wholely or largely to the benefit of the car rider. As a way of avoiding this difficulty, it is suggested that companies which have occasion to work out franchises in the future might give consideration to the possibility of making the raising and lowering of fares dependent upon price index numbers rather than upon barometer funds. Index numbers have proved useful in many ways, and it should not be at all impossible to construct one which would fairly measure fluctuations in the costs of conducting electric railway operations. Entering into the computation would be wage scales for various general classes of labor and prices for the principal basic commodities and materials used in the operation and maintenance of street railways. The level of the index number prevailing at the time of the adoption of the franchise would be taken as 100, and provision would be made for the increase or decrease of fares by some fraction of a cent for each 5 or 10 per cent increase or decrease in the index number. The regulation of fares in this manner would not impair in any way the incentives for increased operating efficiency.

Another common defect in franchises is the heavy burden of paving charges and taxes which they impose upon the grantee companies. The reasons for the requirements in regard to paving have been obsolete ever since the passing of the horse cars, and ordinarily there is scant justification for any special franchise or excise tax on earnings in addition to the usual property tax. In the long run the effect of such provisions is to raise the fare which the public must pay and by so doing encourage the use of private automobiles with resulting increase in street congestion.

The only remedy for unsatisfactory franchises is, of course, the securing of better ones, a process in which the confidence and good will of the public are absolutely essential. To obtain such confidence and good will a company must fully and frankly acquaint its public with its problems and aims. It must also show, not merely by words but also by actions, that it is doing its best to render good service and will make improvements as rapidly as its position will permit. The obtaining and holding of public good will is a task at which the entire staff of a company, not a part, must work, and work continuously. There is hardly ever a case of public mistrust and ill-feeling that will not yield to continued treatment of this very sort. There is in this connection a vicious circle: Additions and improvements cannot be made because of lack of capital, capital cannot be obtained because earnings are poor and earnings are poor because the inability to make additions and renewals results in high operating expenses and loss of traffic. If this circle is to be broken, it is usually by improving the relations of earnings to fixed interest requirements and in this way making possible the sale of additional securities.

WHEN NO MARKET FOR SECURITIES EXISTS

Companies which cannot at present find a market for their securities might adopt one of two courses: either plow back all surplus earnings into their properties for a period of years and by this process gradually effect such an improvement in the relation of earnings to interest charges that bonds will become salable, or else endeavor to effect a readjustment in capital structure. The first procedure should not be followed by a company unless its surplus earnings, together with such funds as it is able to secure from the sale of equipment trust certificates and similar obligations, are entirely sufficient to take care of its needs for new capital, not merely the

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money required to maintain the property in its existing conditions but also that needed to revivify it with new equipment and place it in a condition to attract traffic. If a company's earnings are adequate for this purpose, however, its credit may be restored by this process much more quickly than might at first be thought, as the effect of the reinvested earnings is cumulative.

If, however, earnings are not sufficient to keep the property abreast of developments, then it is best for all concerned, security holders as well as car riders, that a readjustment should be undertaken. In some cases there should be a fair possibility of effecting such a readjustment by voluntary agreement among the holders of the various classes of securities. Almost any street railway property which has been starved for lack of capital will pay a handsome return, in the way of increased earnings, on any new money which may be introduced. For this reason it should not be impossible to persuade holders of existing securities to see that their interests are better served by taking junior securities in a situation with good prospects of growth than by preserving a technical priority on a starving property. There will be cases, however, in which voluntary action cannot be secured and where the knife of forced reorganization must be used. Even when this means the wholesale scaling of debt and the levying of assessments on stock, all classes of security holders are likely to find in the course of a few years that, as a result of the improvement in their company's credit, their new securities are worth more than those which they surrendered.

Of course, there may be more than a mere situation in respect to earnings that prevents a company from being able to do financing. In addition to being top-heavy, its funded debt may be complicated by reason of being split up into numerous separate issues and also its principal mortgages may be closed so that it has nothing resembling a first mortgage with which to go into the money market. Even in cases where mortgages are open there may be difficulty because the bonds which may be issued must bear a particular maturity date or coupon rate. Whenever opportunity offers, whether in connection with a readjustment or otherwise, a new financing medium should be set up which will be as nearly as possible a first mortgage, permitting the issuance of bonds in series varying as may be desired in respect to maturity dates, coupon rates and other provisions.

Even when a company has been placed in a position where it can do senior financing satisfactorily, it may still have a problem on its hands to raise its requirements of junior money. Few companies are able to sell stock, and recourse must therefore ordinarily be made to earnings as a source of junior money. Perhaps most companies will have to continue this practice for some time, but at the very first opportunity they should undertake the sale of stock. In preparation for such an opportunity they might, wherever legally possible, change their stock into shares without par value.

With favorable conditions in respect to franchises and corporate structure must be coupled the assurance of alert and vigorous management, for not even the best set-up as to franchises and capital issues will atone for visionless and inefficient supervision. On the other hand, it is really astounding to find how much can be effected by good management alone in the way of reducing operating expenses and working out improvements to attract traffic.

Present Situation Is Encouraging*

By B. C. Cobb
Chairman of the Advisory Council
American Electric Railway Association

B. C. Cobb

Despite increasing automobile competition, the electric railway industry is holding its own. Modernization of plant and modernization of thought are instrumental in making it progress

WE ARE again deeply appreciative of the hospitality extended to us by the city of Cleveland and its people. Ours is a great and necessary industry, as the citizens of Cleveland well know. Because of their wise action after some years of experiment, their city has today one of the best-operated and most strongly financed transportation systems in the country. Some other places would do well by emulating this example. New York, where politics and not service to the public is the order of the day, would profit by giving heed to what has been accomplished in this fair City of the Lakes. In our great metropolitan center, votes, not transportation service, seem to be the things uppermost in the

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minds of the granting and regulating authorities. And yet here is a paradox, for if the people were properly told and understood, it seems certain that they would see that the 5-cent fare will not earn in sufficiency properly to maintain and give adequate service and would therefore vote for something different.

I think I can fairly say, without fear of contradiction, that the transportation service in New York City today is a crying shame. And why? Politics, and the desire to "fool all of the people all of the time." A unified and improved transportation system under private management, with a slightly increased fare and with proper governmental regulation, would solve the problem, and with great benefit to all concerned.

In 1926 there was no appreciable increase or decrease in the number of passengers carried by electric car and allied motor bus lines. The figure has been almost stationary for the past three years—16,000,000,000 revenue and transfer passengers. Perhaps we should feel encouraged because of this. I mean perhaps we should not become discouraged because of lack of increased traffic when we know that our country has increased in population prodigiously during the years just mentioned. I do not think we should become discouraged when we consider the tremendous increase in privately owned and operated automobiles during that time. Somewhere between 10,000,000 and 11,000,000 is the figure.

The independently operated motor bus is not now the menace that it was, for the industry itself has, to a very great extent, taken over that very necessary adjunct of the transportation service. Happily for the industry, for the bus manufacturers and for the people themselves, a better understanding of the bus situation has been arrived at. The financing of independent bus operation by manufacturers in localities already served is largely a thing of the past. This is for the common good, for ruthless competition in a business which should be a regulated monopoly can only work harm for all alike. We of the electric railway industry should not, however, complain if bus or other transportation service is given in territories needing service if we ourselves decline to give it.

Improved Service and New Methods

No one, if fair minded, can say that the electric railway industry has not in the past few years endeavored to better its service. This is the one thing it has tried to do, not because of altruistic impulse—I think no such claim has ever been made—but because if it was to live and eventually to prosper, it was necessary to renovate its viewpoint and adopt new methods and procedures. This it has very effectively done, not only by adding new and modern railway equipment but by adding motor bus auxiliary service, paying more attention to its personnel, giving the public more complete information as to its needs and necessities, and above and beyond all else, endeavoring to render a service under the most trying circumstances in a gracious and attentive way.

The industry has been courageous in the face of great difficulties. It has steadfastly maintained that it is rendering a necessary service to the people. It has tried frankly to express just what its troubles are and what it needs to make it prosperous and therefore a better servant of the public. Its efforts at salesmanship during the past few years have been noteworthy, with the result that in many instances much good has accrued not only to the industry but to the people as well. It is very gratifying to report and be able to say that, generally speaking, most of the communities—there are a few exceptions—throughout the country have rallied to the support of the industry and endeavored to help it, not only by increasing rates of fare but in many other ways. This is a good sign, for it means co-operation and team work, which in the long run must surely win.

Advisory Council Principles

Last year your advisory council laid down some fundamental principles which it was thought would be of benefit not only to the companies but to the employees and the public as well. These principles your council still stands for, and it believes if they are followed they cannot help but be of benefit to all alike. The most important of these are:

1. The companies must obtain the friendly co-operation of the public.
2. The companies must have their executives always accessible to their employees and the public. They must welcome suggestions made in the interest of the service, grant reasonable requests and have a genuine interest in the welfare and progress of the communities in which they operate.
3. The employees must realize that their interests and those of the company are the same, and make every effort to be useful public servants in an honest endeavor to make friends for themselves and their company.
4. The public must favor a just system of regulation and consent to rates of fare that will make its transportation agent a solvent industry.
5. The public must understand that the best service at the lowest cost can be obtained in a community only through the operation of all public transportation by one efficient organization.
6. The public must realize that 75 per cent of the people use the public transportation service in their daily occupations, and insist that their authorities enact and enforce such effective traffic control that the public vehicles may have a relatively unobstructed use of the streets.

Indiscriminate and unregulated parking of automobiles on business thoroughfares is an evil which still exists, and it is evident that only with the passing of time and better acquaintance with the results of such evil will it be stopped. Not only is such practice harmful to the transportation companies but it is also harmful to the merchant whose front door it clogs. It slows down traffic and because of so doing becomes a public nuisance. If continued, it can only mean additional and unnecessary taxation because of the cost of widening streets.

Government Ownership

There are some among us who are favorable to government ownership and operation of public utilities. They are not many, however, for the feeling in America, which is the outgrowth of the thought expressed in our Constitution, is still too strong for private initiative and endeavor. And yet, if the people want to continue to keep electric transportation in city and suburban service—I cannot think otherwise—it may be they will be forced, in extreme cases, to take over such operation, charging such deficits as may come about to the taxation burden. A better thing, and a more likely thing, will be for the people fairly to regulate and compensate their transportation companies so that they will earn a fair return on the fair value of the property used and useful in the public service.

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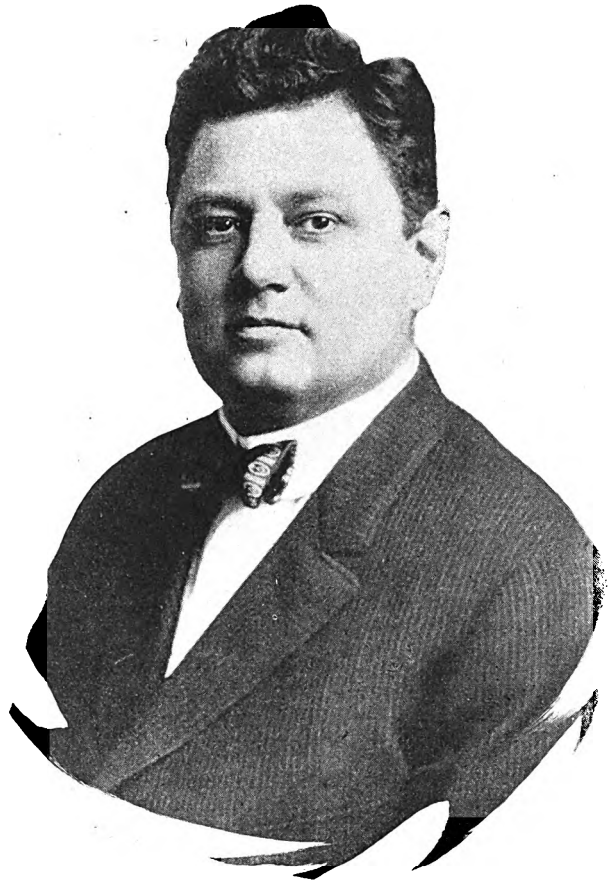
The Autobiography of a Thin Dime*

By E. F. Wickwire
Vice-President Ohio Brass Company, Mansfield, Ohio

This is one of the author's characteristic addresses, containing a wealth of philosophy with a 1928 model dress that is planned to please his auditors, much as he would have them please by dressing up their cars



E. F. Wickwire

"I am a *Dime*—Ten Cents
"I am not on speaking terms with the Butcher
"I am too small to even look at a pint of Ice Cream
"I am not large enough to purchase a good Cigar
"I am too small to buy a ticket to a Movie
"I am hardly fit for a Tip
"But, believe me, when it comes to Street Car Fare
"I am considered *Some Money.*"

PERHAPS you've heard the story of the sailor who was visiting his boyhood chum who had become a minister. The sailor had a parrot. The minister also had a parrot. The parrots were hung up side by side. They looked at each other for a minute and each was suspicious of the other. Finally the minister's parrot, in a funereal voice, said:

"What must we do to be saved?"

The sailor's parrot thought that over for a minute and then remarked:

"Pump like h——, or we'll all be lost."

I think the question asked by the minister's parrot strikes a familiar chord in the minds of all of us connected with the electric railway industry. We have been trying to work out the right answer to that question for quite a spell.

Maybe you'll agree that the answer given by the sailor's parrot to the minister's parrot pretty nearly hits the nail on the head.

The next question that perhaps naturally comes to mind is: "Are we steering the 'old boat' in the right direction to reach safe waters?"

And this is a vital question that concerns everybody connected with the industry—whether he be an operating man or a manufacturer.

Recently I noticed a card displayed throughout a manufacturing plant which read something like this:

"Who is your real boss?"
"Is it the president? No."
"Is it the superintendent? No."
"Is it the foreman? No.
"Your Real Boss is the CONSUMER of our Product—the man who buys the article that you are helping to make.
"If he is satisfied with your Product, he will continue to patronize you. If not, you will lose his patronage, perhaps without even hearing a complaint from him.
"Furthermore, the quality of your Product is the yardstick by which he measures the price he is willing to pay for it.
"It is not simply a question of satisfying yourself—you must satisfy him.
"At times you may think he's a 'Crank,' so keep this definition of a Crank before you!
"A CRANK IS A FELLOW WHO INSISTS ON CONVINCING ME, INSTEAD OF LETTING ME CONVINCE HIM."

Doesn't this same principle apply to the electric railway industry? Isn't the user of our product—the car rider—the real boss? And isn't it up to us—all of us—to satisfy him in order to progress and prosper?

And if we are really aiming to satisfy this real boss—the consumer—doesn't it stand to reason that we must constantly study his likes and dislikes; find out what appeals to his spending instinct, and do our utmost to develop our product accordingly?

You may say, "That sounds all right, but it's not such a simple matter to read the minds of the fickle public in our case." And I agree with you thoroughly. But I think you agree with me that a determined, intelligent and organized effort on the part of all of us will find ways to accomplish our purpose.

It's a good mark to shoot at—and you know Cleopatra finally "made her Marc."

We might do a lot by establishing scientific research departments. I use the term "scientific" because anything is scientific when we don't quite understand how to accomplish it.

I recently heard a man who has been prominent in so-called scientific research work for improving the automobile make this remark:

"Our constant aim is to find out what appeals to the public; what it will buy, because anything that can be sold can be manufactured."

*Abstract of an address delivered at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Oct. 3 to 7, 1927.

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Isn't that a significant comment, "anything that can be sold can be manufactured?" And wouldn't we do well in our own industry, both operating man and manufacturer, to dig a little deeper into that point?

I doubt if there is any field in which the mechanical and technical problems have been more intelligently, logically or thoroughly worked out than in the electric railway industry. Hampered by low fares and working under that first fundamental law of railroading—"service must be maintained under every condition"—there is no denying that electric railway men have accomplished wonders.

The Automotive Man's Philosophy

This automotive man whom I have quoted has evidently studied people from this standpoint. To quote him further:

> Every trade in the world hates the introduction of a new idea into its routine, if the idea looks new. Therefore, be careful how you wrap it up. They award medals for a new idea only after it becomes old.
>
> So we must study that end of the thing and the business relationships, the common, every-day, work-a-day things, simply to find out whether we do it by force of habit, whether there is any sense to it or whether there isn't.
>
> So the principal way to start research in any organization is to start at your desk. Turn it 180 deg. around and see how much different things look. Just move a few things around. Go to a different restaurant to eat, or do something differently."
>
> [Suppose in our case he might suggest riding to work on a street car.]
>
> That is all that is wrong with us; we get to doing the same thing in the same way every day and all the rest of the world disappears.
>
> So we have to get out of the rut; that is the greatest problem that research has today, to get us mentally out of the rut, and the rest of the things come as a matter of course.

I have taken the time to quote these remarks from a man high up in automobile research work partly because they appeal to me as very much worth while in themselves and also because the development of the automobile has created an entirely new set of conditions in the electric railway industry.

So, whether we like it or not, the automobile seems to be our principal competition. And a little analysis of some of the ways the automobile industry has appealed to the public in motor transportation may emphasize the importance of some points as applied to our case.

For example, we all know that the "appeal of appearance" has been one of the strongest selling factors in the automobile industry.

Knowing, as we do, that the decided changes and improvements in the lines and appearance of the 1928 model motor car, as compared with, say, the 1918 model, have appealed so strongly to the public, is it reasonable to assume that it will not respond to more of the same kind of treatment, applied to the trolley car? There is a question of degree of course, and this doesn't mean that the trolley car has to look like an automobile, but it should look less like the old "5-cent" street car.

The motor car industry has not been able to get motorists to adopt the polecat's motto, "don't hurry—others will," so it has made marked improvements in recent years in the matter of quick acceleration, and you will find it featuring this point in its advertising and in its sales talk.

In the matter of comfort, the motor car manufacturer has made constant improvement, even to the point of providing, in some cases, cushions stuffed with "goofer feathers, or fuzz from peaches."

Here, again, enters the question of degree when considering the trolley car, but it doesn't stand to reason that a man is cheerfully going to transfer his pampered anatomy from a wide, comfortably cushioned automobile seat to a narrow, hard-surfaced trolley car seat.

Automotive engineers will tell you that quietness and power do not naturally go together in a gasoline engine, and yet they have spent years trying to make the motor as quiet as possible. And it stands to reason that if his nervous system suffers so much from the squeaks and rattles that develop in the motor car, he also has a sensitive ear for the grinds and howls that develop in the trolley car.

Last, but not least, we all know that the trolley car that presents a clean, bright, attractive appearance makes a strong appeal to the public.

The motor car has developed one outstanding characteristic in the American public today, and that is impatience. People won't walk, nor will they wait to ride; in fact, they can scarcely wait for a traffic signal to change.

Like the little Irishman who was hurrying along in his flivver and was stopped by the traffic officer, who said, "Wait! Pedestrians are now passing." After waiting impatiently for a minute the little Irishman yelled to the cop, "Say, when kin a Catholic get past here?"

Speed, but for What Purpose?

A big percentage of the people today are rushing madly around in motor cars, hurrying to get somewhere, and half of them don't know what to do after they get there. Nevertheless, they demand speed in the matter of transportation, and I believe that most of us have decided that we have to face that issue squarely.

There's no use trying to satisfy the car riders with what satisfies us. We must deliver the kind of a product that satisfies them, or it won't work any better than "trying to amend the Constitution without first amending the people to fit it." Their requirements may seem unreasonable, but is it easier to rebuild the public or to rebuild our product?

These truths bear much repetition; they but confirm what the sailor's parrot said about the necessity for keeping on pumping—"pumping" new ideas into the industry to keep pace with changing conditions.

Why will people willingly pay taxes to provide more and more street space for private cars and then begrudge an extra penny or two to ride on street cars, which carry five times the number of people for a given amount of street space?

At the opening of our county fair the other day police estimated that 10,000 automobiles had arrived and only 2,000 people.

One reason for all this "scotching" on street car fares is because shrewd politicians everywhere have rubbed elbows with and studied this "real boss" that we've been talking about—the consumer of our product. And they know that it's not hard to convince him that he shouldn't pay 10 cents to ride in the trolley car that he used to ride in for 5 cents—or one that even looks like the one he used to ride in for 5 cents.

Yet shopkeepers tell us that the workingman nowadays is buying silk shirts. And the working girl is wearing silk stockings—so I've heard. Cotton stockings are "on their last legs," and, by the same token, "cotton" street cars are on their last wheels. And it's a safe bet that the 1928 model shop girl will cheerfully pay 10 cents to curl her 1928 model silk stockings under the seat of a

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1928 "silk stocking" model rail coach if she gets half a chance. And no wise politician would attempt for a minute to tell her that she couldn't afford it.

But most of us realize that modernized equipment alone will not solve our problem successfully. It must go hand in hand with modernized merchandising methods. And it is encouraging to note that the industry as a whole has rediscovered how to sell its service, instead of simply allowing patrons to buy it, as they did in the old "horse-and-buggy" days.

In this connection, the aim of your committee on co-operation of manufacturers is to inspire manufacturers to make a more intelligent and intensive study of the industry's needs, and so stimulate the creation of more new ideas, together with creative selling effort in presenting these ideas to operators.

Not that the manufacturers have not been making improvements. One look at the excellent car exhibit at this convention will offset any such impression. We've made a good start and will undoubtedly create and adopt improvements much faster from now on, particularly in respect to further changes in the lines and outward appearance of the car.

Long ago the automobile industry called in the artist to create new body designs, and the artist may have thought a spark plug was a horse. But he went ahead and beautified the lines of the automobile body. Then the production man was called in, and he said, "It can't be built to look like that." But the executive said, "This is not just an artistic picture; it's a commercial proposition; it must be built"—and they found a way to do it.

There is nothing like calling in the right man when you want something done. Like the Scotchman who wanted to put up a brick building—so he called in a Free Mason.

The next subject on the program this morning is entitled "How the Industry Is Progressing," the idea being to present short talks by operating executives relating to accomplishments of the year on properties in various parts of the country.

It has been well said that "the individual today counts for so little in the entire make-up of the industry that only by an exchange of ideas and finding out how little we know, do we go back home and want to learn more. We should all listen to these new ideas and give them fair consideration.

We are all pretty much alike as human beings, and every time a new idea is presented we are quite willing to tell what's wrong with it, because it's more fun to throw bricks than to lay them.

But shouldn't we go a step further and say, "Can you overcome that difficulty?" And if you do overcome that one, you may develop another. And if the project is worth while, you can go ahead and solve that difficulty—if you don't get tired too quickly.

Conservatism has its place, but progress means pioneering. It's all right to "keep both feet on the ground," but you can't walk far if you do.

So let's not be backward about presenting new ideas at these meetings for fear they may sound radical.

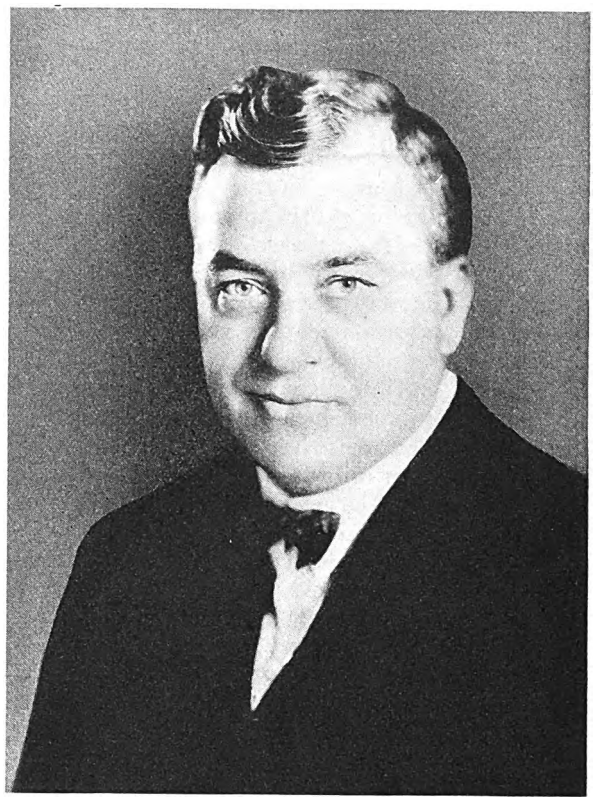
Like the Christian Science testimony meeting that I read about recently. There were many enthusiastic talks acknowledging the inspiration and help received from Mary Baker Eddy, the founder of Christian Science.

Finally, a meek-looking little woman in the audience arose and said, "I'm only a visitor here and never heard of Mary Baker Eddy before, but I just want to tell you what Lydia Pinkham has done for me."

Evolution of Regulation and Accounting*

By Harry Boggs

Herdrich & Boggs, Certified Public Accountants, Indianapolis, Ind.



Harry Boggs

EVOLUTION means the ascent from simplicity to complexity. This is the history of regulation and accounting.

As most of you are connected with an enterprise that is regulated by law, it might be interesting to know that regulation is not a recent invention or a new discovery.

The difference between private enterprise and public calling are the most salient characteristics of the law of business relations. The causes of these differences are more economic than legal.

In public callings the state imposes affirmative duties, but in private enterprise usually the duties or restrictions are negative in character.

The history of the development of this distinction between public business and private calling show clearly the legal and economic basis upon which the modern law rests. [Mr. Boggs then reviewed some of the regulations in medieval times, pointing out the economic basis.]

[After citing certain classes of business that are now usually considered as public utilities Mr. Boggs takes up the question of why they are so classified.]

The question arises, why these classes of business are

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regarded as public utilities and subject to state regulation, when other businesses are not so regulated. The principal reason is economic. It takes comparatively little capital to open a shop or a grocery store, therefore the field of these callings is practically unlimited as to competition, and competition may be expected to regulate service and prices. But the classes of public utilities hereinbefore named require large investments. To attract the capital required for such investment it is considered necessary in most cases for the state to grant a monopoly; that is, to guarantee the company which provides this service that it shall not be subject to competition in its field and that it shall be permitted to earn a reasonable return upon the fair value of its property actually used and useful for the convenience of the public.

In return for that grant, and in order to prevent the monopoly from becoming burdensome on the public—that is, from charging exorbitant rates, or giving inadequate service—the state makes exact and rigid regulations for the conduct of the business. These are affirmative duties. The state says that the business shall be conducted in a certain manner.

Let us take, for the purpose of comparison, an electric railway utility and any typical private enterprise, such as a merchandising or a manufacturing business.

In the first place the character of a public utility corporation is such that in order to furnish adequate service to the public a very large fixed investment is required.

While this may also be true, to a degree, of some manufacturing concerns, in commercial undertakings the capital turnover occurs several times each year and the fixed investment is relatively not large.

A manufacturing plant may operate when and as long as it pleases those in charge of its affairs. Its products usually can be stored until needed. The capacity of the plant can be adjusted to the demand of the market, but the size and capacity of the plant of an electric utility must be sufficient to meet the highest peak demand made upon it, even though that demand continue but for a short time.

A utility furnishing electric current must be in constant operation and production, 24 hours a day. A utility must serve all who apply and must sell its product without discrimination in price. Those who are engaged in manufacturing and commercial enterprises are not so restricted. They may sell or not sell, as they please. On the other hand there are certain advantages and privileges which accrue to public utilities which are not shared by those engaged in private enterprise. There are certain legislative restrictions upon competition which inure to the benefit of the utility.

So we find that the determining factors with respect to these matters are economic and not legal and it is the inexorable economic law which governs and controls.

Accounting Is an Important Factor

Now that we have briefly traced the development of regulation, let us talk about the accounting department for a few minutes, to see if there has been any developments worth while and to determine, if possible, just how much importance to industry attaches to this fascinating profession.

[Attention was directed by the speaker to the early methods in vogue when trading was first indulged in by human beings and showed how transactions were recorded then.]

In years gone by many merchants viewed the accounting department as a needless expense and a nuisance. The very first thing that transpires after any new company is organized is to call for an accountant to open up a set of records, thereafter to be kept in such a manner as will correctly reflect the true condition of affairs throughout its corporate history.

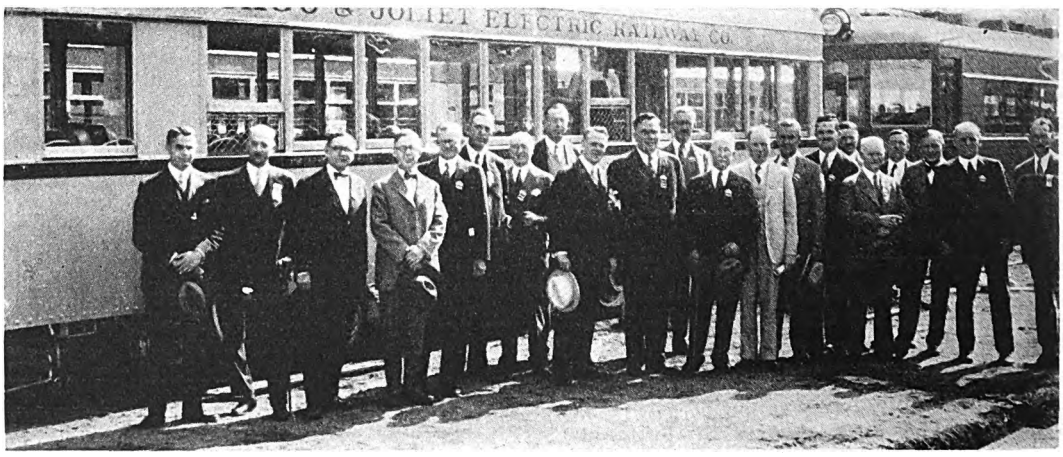
The owners of a large corporation may have a wonderful institution, but they must depend upon the accounting department to keep them posted on the trend of the business and warn them of the leaks.

I am sure that no public utility can properly function without a competent accounting department. The law prescribes just what accounts shall be kept and how and when periodical reports must be made to the commissions and the books must be accurately kept in order that the reports will tell a true story.

We all know that the income tax law has been a very important factor in bringing about a wider recognition of the indispensability of the accountant.

Some of the highest executives in our largest industries have come up through the accounting department.

May I leave with you the thought that the accounting department is rapidly mounting to its proper place in the utility field as well as in the commercial and industrial world and must eventually be recognized as the most important and vital factor in every business organization.



Members of the exhibit committee

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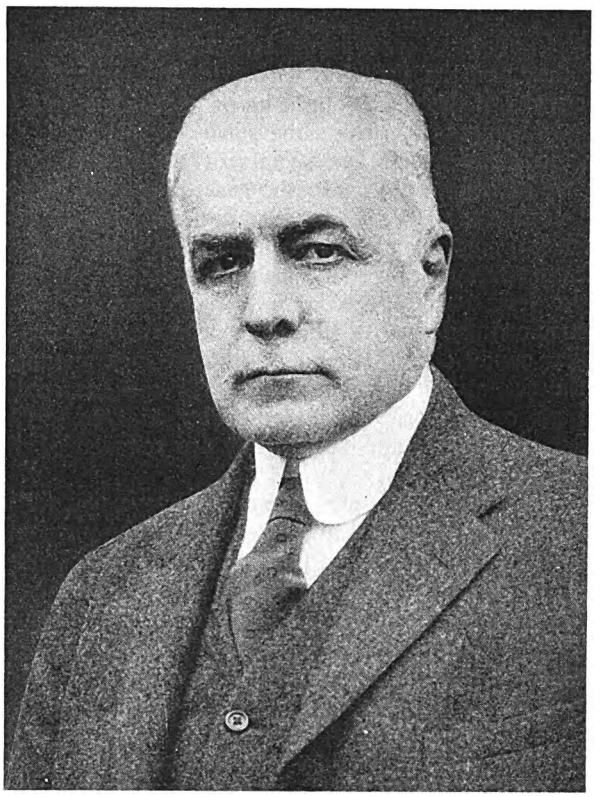
An Informed Public Is Fair*

By George B. Cortelyou

Chairman Joint Committee of National Utility Associations



George B. Cortelyou

THE Joint Committee of National Utility Associations had its genesis in war conditions. To expedite the placing of their resources at the disposal of the government and to serve as a means of contact with the government on the larger problems created by the war, the utilities formed several joint committees. The end of the war naturally brought an end to these special duties, but it was thought best to continue some form of organization that would function in time of peace and that would facilitate common action on questions of larger import affecting the utilities. The present joint committee was the result.

The national utility associations comprise the following: the American Gas Association, the National Electric Light Association and the American Electric Railway Association.

Despite the fact that the country as a whole has accepted and indorsed the policy of private ownership, operation and management of the utilities, ardent advocates of contrary policies appear from time to time with specious plans that would involve the government in vast expenditures, whereas every practical feature of their plans—so far as they have any practical features—could be secured, at infinitely less expense, by the normal extension and development of existing private agencies. They would have us believe that government can carry on the business better than those who have grown up in it and have made it what it is today, and this in spite of the wrecks that litter the road over which government operation has traveled in the past. Many of these enthusiastic theorists are less concerned with the success of their particular project than with gaining an entering wedge for their paternalistic ideas.

The American people want to be just and fair. Of that there can be no question. They have proved it time and again both in their domestic affairs and in their external relations. Temporarily they may be misled by prejudiced and partial information, they may follow false gods for a time, but in the long run they reach sound conclusions.

The price of liberty is the freedom to make mistakes. While it is true that the people may be trusted to reach sound conclusions in the long run, if the run is too long, irreparable damage may be done before the situation can be righted. Surely we are justified, then, in attempting to avoid this by pointing out the errors and fallacies involved in many of the proposals affecting the utilities that are urged from time to time, by disseminating reliable information concerning them and by endeavoring to keep the line of progress as straight and unbroken as possible.

There is neither mystery nor hidden purpose in the program of the joint committee. Its work will be carried on openly and frankly. It seeks no favors; it asks only that its presentation of the utility situation be considered and dealt with on its merits. But that such presentation may be so dealt with, it exercises the common right of all American citizens or organizations to be heard on all matters in which they are interested that become the subject of public debate or decision, and having presented its case it will, with confidence, abide the informed judgment of the people.

We believe that an informed public is a just public. We intend, therefore, to give the public the truth about the utilities, their aims, their hopes, their difficulties, their accomplishments. We shall try, among other things, to demonstrate that the entry of government, whether national, state or local, into this field is constitutionally unsafe, politically unwise, economically unsound and competitively unfair. And this we shall do, not wholly from the selfish standpoint, but because it is the obligation of every good citizen to fight the spread of theories which, if adopted, would undermine the structure upon which our national progress is founded. We believe that we can so present the outstanding merits of utility service under private ownership that an informed public will be unwilling to abandon the solid ground of that system for the quicksands of government ownership.

Although the utilities as a class are rightly regarded as among the most stable of our industries, they are by no means exempt from the effects of changing conditions and the necessity of adapting themselves to them. Periods of readjustment are always difficult and often painful. The dislocations caused by the war, with costs far out-

**Abstract of an address delivered at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Oct. 3 to 7, 1927.*

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stripping rates, were a severe trial to the utility interests, but they met the situation with faith and courage. The aftermath of the war brought its problems also, and these too are being met in the same spirit.

Among the ever-present facts of the utility situation is that of competition. In the case of the gas and electric companies, this is largely indirect, except in the great and growing industrial field. Gas, especially, must meet the competition of other fuels such as coal and oil where heat is required in industrial operations. The electric company, in its wholesale department, deals with similar conditions. Of course, both are legal monopolies in the sense that there is usually but one gas company and but one electric company serving a given territory, and to this important extent they are relieved of direct competition.

When we come to the electric railways, we find the competitive situation greatly intensified. The phenomenal increase in the use of the passenger automobile, the bus and the truck reacted with serious consequences upon the electric railways, both urban and interurban. They were faced with grave losses, many were forced into receiverships, and many miles of track was abandoned. Had they outlived their usefulness, were they about to disappear from our streets and highways and take their place among the relics of an age that had passed? To these questions many were prepared to answer in the affirmative and were getting ready to sing the "swan song" of the electric railways, just as in earlier years there were those who doomed the gas industry to extinction when it lost the major part of its lighting load to electricity. But happily in neither the one case nor the other were the prophets of evil justified by the event. Just as gas recovered from its temporary setback and marched on to triumphs undreamed of in that early day, so the electric railways, now that they are getting their "second wind," are gradually working out of their difficulties and are more than holding their own. Public opinion, which at first was inclined to be somewhat apathetic, is now awakening to their value as a means of economical mass transportation.

Much of course remains to be done. Their credit must be restored, which can be accomplished only by larger earnings, and this in turn may call for further revision of fares in some instances; equipment must be modernized, better business and accounting methods must be adopted, service must be improved, discriminatory taxes and other oppressive exactions must be abolished, and so on. All agencies of transportation, whether street railway or bus, must be so co-ordinated that unnecessary duplications of service and facilities will be avoided.

Substantial progress is being made along most of these lines. The important thing is not so much the speed at which we are traveling as the direction in which we are going. The electric railways are headed in the right direction. Their return to the place that is rightfully theirs in our transportation system will be hastened if they are protected from the type of competition that is merely destructive in its effect and that in the end benefits no one, the public least of all.

This does not mean that competition should be done away with, even if that were possible. There is no stronger incentive to effort than competition, actual or potential, and one kind or the other is present in every industry. We of the utilities do not know at what moment our products may be challenged by new discoveries, new inventions, new developments, but we must be prepared to meet the challenge whenever it comes, on the basis of service and price. If we cannot do so, we must step aside or be pushed aside. We are not passengers in the industrial boat, but working members of the crew. We must "pull our weight" and a little more. We exist to serve the public, and our contribution to the public welfare must be measured by the touchstone of service.

Progress

Is the Achievement of Many Minds and Many Hands *That Is the Glory of Life**

By Dr. Alfred W. Wishart
Pastor Fountain Street Baptist Church
Grand Rapids, Mich.

Dr. Alfred W. Wishart

IN A RECENT magazine article a writer deplores the practice of inviting ministers to address conventions of business men. He thinks the necessity to increase sales demands high-powered salesmen whose chief stock in trade is emotion. Ministers are assumed to be past-masters in the art of arousing emotions and so can render aid to salesmen. Then, again, religion, prayers and clerical co-operation lend respectability to business ventures and help to establish confidence in the mind of the

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consuming public. If that is a true explanation of the presence of ministers on convention platforms, I am out of place here for several reasons.

First, because I believe a religion or a business that exalts emotion above reason invites disaster. Confidence and good will in business must be rooted in something more substantial than sentiment. People may be swept off their feet temporarily by emotional appeals, but unless religion and business can meet the demands of our intelligence and actual needs, the whirlwind will pass away, leaving ruin in its wake. In the long run we have to face facts.

Secondly, I believe that while prayer has its proper place in life, it has its limitations. It requires something more than prayer to please the public, to deal justly with employees and to make business profitable. Piety is no substitute for hard work, efficient management, enterprise and high intelligence.

And lastly, I must frankly express a sorrowful contempt for any effort to palm off on the public cheap and shoddy goods, inefficient service of any sort and unsound financial ventures in the name of the Golden Rule or by the aid of advertising sprinkled with pious slogans. The noblest religion in business is downright honesty and square dealing, which means giving a dollar in value or service for every dollar received.

To do this in your business demands a variety of high qualities of intelligence and character. It requires you to keep pace with changing conditions, to meet new needs, to deal efficiently with the many difficult problems that confront modern traction companies. A manager who is too conservative and dull of perception to keep up with invention, new ideas, new methods, is as big a detriment to your business as outworn equipment and machinery. Both belong on the scrap heap.

Obsolete ideas and methods, refusal to change with changing conditions, sticking to old traditions that have lost their meaning and utility are causes of many failures in business and of loss of power and prestige in religion.

The disasters that overtook public utilities in the period from which we are beginning to emerge were largely the result of bad policies, corrupt or inefficient methods and stubborn refusal to face the facts of changing social, political and economic conditions. During that unhappy period there were frightful economic losses, embittered relations between the people and public utilities, strikes and corrupt political alliances. The new order of things which is gaining ground every year is the result of the labors of men of vision, courage, faith and initiative. They are the pioneers of a new era in which the street-car service has been improved and public confidence has been created through judicious appeals to reason. The old methods of protecting public utilities through corrupt political influence are being abandoned. How many are still wandering in the wilderness, unconverted and unconvinced, you know better than I.

Perhaps this is one of the reasons for my being here—to help the progressives convert the unprogressives. Eyes have they, but they will not see; ears have they, but they will not hear. May I humbly suggest that one ground of hope for the unregenerate is that most of the progressives are relatively recent converts? To a great degree the sufferings of public utilities have been brought upon them by those engaged in the business as financiers and executives. Some were the work of demagogues who took advantage of evils that should never have existed. Others were the result of failure to keep up with the march of applied science. And still others were due to a blind refusal to appeal directly, frankly and intelligently to the public.

Patience is indeed a great virtue. Rome was not built in a day. To make matters worse, we no sooner think we have solved our problem than some new idea upsets our theories and requires us to grapple with fresh problems. That is life. This modern world, especially, is no place for skeptics and cowards, the lazy or the stubbornly inefficient. Hence these conventions that inform, inspire, encourage and enlighten! No man, no corporation, no country, is sufficient unto itself alone. We need one another. Progress is the achievement of many minds and many hands. That is the glory of life. Civilization is impossible without co-operation, friendship, patience, courage and mutual confidence. There is no sharp boundary line between religion and business. Your great enterprise, the business of daily transporting millions of people in this broad land of ours, demands moral qualities of a high order as well as engineering skill and executive ability. The reason is that morality is basic to business, for business, after all, is life. Your contacts are not only with machinery but folks. Your problems are not all technical, mechanical, financial. They are problems in human relationships. And I do not see how such problems can be successfully dealt with if we ignore the moral factors of human contacts.

We exist to serve the public, and our contribution to the public welfare must be measured by the touchstone of service.

—GEORGE B. CORTELYOU.

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What Makes Good Track?*

By Frank B. Walker
Chief Engineer Eastern Massachusetts Street Railway

F. B. Walker

WHEN the Eastern Massachusetts Street Railway was reorganized in 1919 several hundred miles of track was in poor physical condition, and it became necessary to carry out an extensive rehabilitation program. New funds were limited, and it was a problem in economics as well as in engineering to carry out the work successfully.

The way and structures department was completely reorganized and decentralized. New track machinery was purchased, an intensive study was made of modern methods in use on other roads and some new ones were devised. A course of training on modern track construction and maintenance methods was given to supervisory and productive forces. Three hundred and ninety miles of track has been completely rehabilitated and welded. Only 10 miles of unpaved and 67 miles of paved track was laid with new rail. Thus it will be seen that 80 per cent of the rehabilitation was carried out by using the old rail. By the use of modern methods of straightening rails, repairing and welding joints, surface welding and grinding, this track has been put in good operating condition at a cost ranging from $1 to $2 per lineal foot. The total estimated saving is not less than $3,000,000.

The condition of the old rail was such that it could not be re-used without the vertical bends being removed and the joints welded. We developed a new bender consisting of a girder beam, on the center of which was a 35-ton jack with heavy yoke passing underneath the rail joint and with adjustable feet for various lengths of bends. On the rehabilitated track 150,000 joints were straightened out with this type of bender at a cost of only a few cents each. In 1921 after about 15,000 joints of various types had been welded, the metallic arc method was adopted and has been standard on this property since. Of the more than 115,000 joints of this type that have been welded, failures have been fewer than with any other method.

It was found that much of the old, lighter rails could be welded by the use of the original angle bars, with the outstanding flange cut off by an acetylene torch. Although this kind of joint had considerably less strength than the rail, many thousands of old plates were used and only a small number failed. This led to the conclusion that the actual strength of the welded joint was of not as much consequence as the quality and kind of welding. This is especially true on 7-in. T-rail and 9-in. girder rail in paved streets. Of our total of more than 130,000 welded joints none has failed by impact. Such few failures as have occurred have been on account of secondary stresses from the welding process or temperature changes, and we believe that properly welded joints will not fail on account of wheel impact. The company has recently developed a new base-plate head-bar type of rail joint, which is stronger than the fish-plate type and is cheaper. More than 2,000 of these are now in service.

Grinding joints was considered an important part of the program, and 175,000 joints have been ground out of a total of about 200,000 in the entire system. Of these 122,500 were surface welded before they were ground. Corrugations in the head of old rail to the extent of about 640,000 lineal feet, were ground out concurrently with the rehabilitation program. The pounding of cars over rail joints and corrugated rail has been practically eliminated, and noise has been reduced to a minimum.

We are trying to bring our property, and have almost succeeded, to the point where there are no bad joints or noisy tracks. We are competing with rubber-tired vehicles, and it is essential that we eliminate track noises, and particularly those track noises caused by bad joints, corrugated rails and pounding special work. In this connection it may be of interest to note that we are welding all exterior and interior rail joints of all special work, as it is believed that by the elimination of such bolted joints the life of special work will be materially lengthened and the noise from pounding joints eliminated. So far there has been no trouble due to breakage of such welded special work.

Our present standard paved track is similar to that on many other properties, consisting of either 7-in., 91-lb. T-rail or 9-in. 104-lb. girder rail, metallic arc-welded

*Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Oct. 3 to 7, 1927.

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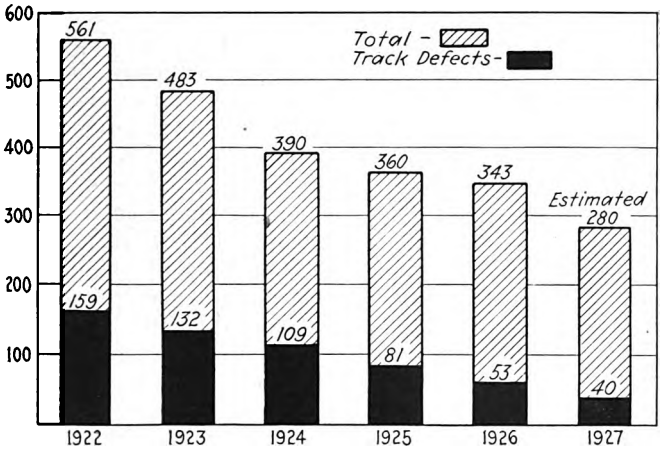
joints, tie rods on 5-ft. centers, tie plates, 6-in. x 8-in. x 8-ft. creosoted hard pine ties and 6 in. of ballast. This costs about $4.40 to $5.40 per foot of track, exclusive of paving, depending on type of rail, traffic, etc.

Particular attention has been paid to drainage, as the greatest enemy of good track is water. Most of the old tracks needed more drainage, especially on country lines where there were no side ditches. The tracks formerly were backfilled to the tops of the rails and for long distances the track area was below the highway level. One of our problems was to convince highway and municipal



Derailments have shown a steady decrease on the Eastern Massachusetts Street Railway since the inauguration of the track rehabilitation program

authorities that we should be allowed to raise our tracks level with the shoulders of the adjacent road. An energetic campaign of education was carried on, with the result that we were permitted to raise and ditch about 235 miles of country track. As a result the tracks are more easily maintained, water is carried into the side ditches to culverts, snow is more easily removed, and much better conditions exist than heretofore. In cities the matter of drainage is different, but by placing more catchbasins and seeing that the pavement itself is sealed against the entrance of water along the rails and into the subgrade and ballast the question is largely solved.

The matter of suitable ballast for both paved and unpaved track received considerable thought. The old company had used broken stone ballast on a portion of its paved track and on one or two lines in the country. On open track broken stone is undoubtedly best. It is also the most expensive. On the major portion of our country lines a good quality of bank-run gravel was used. On heavy service country lines stone was used. On paved tracks the practice of using broken stone was adhered to for several years, but on account of its increased cost and the fact that the modern type of pavement almost effectually sealed the track area against the entrance of water, the use of screened gravel was adopted several years ago, and it has been found not only that this is less expensive but that it is as good as if not better than broken stone.

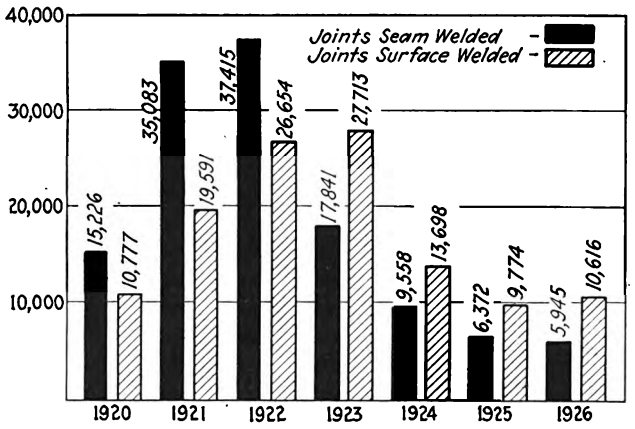
Maintenance costs of paved and unpaved track have been materially reduced in those sections of the track which have been rebuilt or rehabilitated and particularly where the rail joints have been welded. The welded unpaved track has been successful beyond our expectations. Maintenance expense has been reduced at least $300 per mile per year. Riding qualities have been

EASTERN MASSACHUSETTS STREET RAILWAY. ACTUAL COSTS CITY TRACK CONSTRUCTION

Acct. No.		Lowell, Bridge Street 1,380 Ft. 7 In. T-Rail	Lowell, Lawrence Street 600 Ft. 7-in T-Rail	Lowell, Bridge Street 2,280 Ft. 7-In. T-Rail
1	Superintendence	$83	$35	$100
2	Ballast	823	364	1,336
3	Ties	905	418	1,496
4	Rails	1,686	722	2,913
5	Rail fastenings	574	247	976
8	Track roadway labor	1,870	1,004	2,965
9	Miscl. track expense	147	80	435
	Total	$6,088	$2,870	$10,221
	Cost per foot	$4.41	$4.78	$4.48

materially improved. Bond renewals, formerly at the rate of about 20,000 to 25,000 per year, have gradually decreased to almost nothing on welded track and only a few hundred per year on the remainder of the system. Return circuit on all lines is in excellent condition, and very rare indeed are complaints made of electrolysis conditions. Derailments due to track defects, bad joints or special work and such other causes have decreased from about 1,000 per year to about 40 per year.

For every $100 spent on track, $44 is spent for material and $56 for labor. The human side of track work is, therefore, of more importance than the material side, if viewed from a dollar standpoint only. An engineer recently asked, "What makes good track?" To this we replied, "The hearts and muscles of the men who do the work." On this property the great need of having work performed properly and by men who knew how to do good work was early recognized. Although the methods employed must be fundamentally sound and the rails, ties, ballast and other materials must be proper for the location, the most important thing is to do the job in a workmanlike manner. We have imbued all of



Yearly record of joints welded on Eastern Massachusetts Street Railway

our men with the idea of not being satisfied with "good enough" and remembering that the best was "none too good."

It is of the utmost importance to have interested men, whether it be supervisory or productive, and it was not difficult to get those men interested. We try to have no old time "bosses" on this job. On the contrary, those of us who are in authority endeavor to be instructors rather than drivers. As a parting thought, I will say that such success as this track department has had on the Eastern Massachusetts property has been because we have considered the human element as of more importance than the material one.

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Trends in

Motor Coach Engineering*

By H. D. Church

Director of Engineering White Motor Company, Cleveland, Ohio

H. D. Church

SEVERITY of the operating requirements of the modern motor coach is rapidly setting up new standards of engineering in motor coach design. Certain engineering practices that are perfectly safe on other types of vehicles have no place in a modern motor coach. The design of any piece of mechanism is determined by operating requirements. A satisfactory motor coach design must be one that either earns or saves money for its operator. The most important developments in the immediate future will probably be in the direction of refining and improving present designs to give greater safety, greater passenger comfort and, last but not least, lower operating costs.

Considering the various chassis units, the engine, clutch and transmission are those in which the greatest improvement is to be expected in the near future. In the broadest sense, the engine design is determined to a large extent by the maximum torque requirements. The engine must have a number of cylinders that gives inherent balance, and the maximum torque requirements will be an important factor in determining how many cylinders are used. With the present-day fuels a distinct limitation on the cylinder bore is imposed by the detonation characteristics of the fuel. A discussion of this phase of engine design would take too much time, but considering the factors involved, it is not likely that cylinders of larger than 4½-in. diameter will be used, owing to difficulties with detonation and cooling of piston heads. There is something to be said in favor of each of the three types of cylinder construction in use today —namely, the sleeve valve, L-head and overhead valve. Each type is being constantly improved, and actual service alone can give the ultimate answer as to which is the best.

The engine lubricating system is at the root of many troubles today. Full forced feed to all working parts is essential. Provision for properly cleaning the oil is desirable, as well as some design of oil cooler to maintain proper viscosity in hot weather. A lubricating detail that should be given more attention in design is the elimination of oil leaks. An engine or chassis unit which is covered with dirt externally as a result of oil leaks is hard to inspect for condition, and difficulties that may have developed are less likely to be discovered. Improvements in engine design as well as in lubricating systems will undoubtedly give much longer life to all the engine bearings.

The importance of rigidity on the life of the working parts cannot be overestimated. A sufficiently stiff crankcase and crankshaft design will go a long way toward the elimination of bearing troubles and the attendant expense. Stiffness of the cylinder block and head is also important. With the detachable cylinder heads almost universally used, the design should be such that the tightening of cylinder head studs does not distort the valve seats or guides.

Rapid progress is being made in exhaust valve cooling, which will greatly lengthen the periods between valve regrindings. Improvements in the induction system are coming which will give better distribution, higher mean effective pressures for the same detonation and better economy with the present-day low volatility fuels.

All engine accessories, with the possible exception of the fan, should be positively driven through inclosed and automatically lubricated chains or gears. Clutches will probably have lower unit pressures and better provision for heat dissipation in order to prolong the life of the facings. Some provision to insure a really soft and progressive engagement throughout the life of the facings is highly desirable, as it will save wear and tear on the entire driving train between the clutch and the rear wheels. It is probable that pedal pressures will be decreased in order to prevent driver fatigue. Transmission modifications are to be expected in the directions of easier gear shifting and greater silence in the geared speeds.

Chassis frames are being designed to give greater resistance to twisting, which should permit the use of lighter bodies without the sacrifice of body life. In this

**Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Oct. 3 to 7, 1927.*

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connection, I think, there are interesting possibilities in the development of light-weight bodies.

There is a strong trend toward greater accelerative ability to enable the coach to keep its place in modern traffic; by the same token better brakes are needed. I believe that metal-to-metal brakes on all four wheels operated by compressed air or some other form of servo device will soon be considered indispensable. This construction utilizes the entire vehicle weight for braking traction, requires little muscular effort of the driver, is excellent from a cooling standpoint, and its action is practically unaffected by oil, water or grease on the braking surfaces.

The use of low-pressure tires should become more general, due to the demand for increased passenger comfort. In addition, there should be a distinct decrease in chassis depreciation when low-pressure tires are used, due to the added cushioning effect, which protects the entire chassis from minor road shocks. The more widespread acceptance of low-pressure tires has probably been somewhat delayed by several causes. In the first place, they have not as yet fully demonstrated their ability to give the same cost per mile as the high-pressure tires. This is because of overloading and constructional difficulties met by the manufacturers. Low-pressure tires have one other less serious drawback, in that they require a greater mechanical advantage in the steering gear.

There will probably be distinct improvements in chassis lubrication. The lubricating requirements of a motor coach chassis are exceptionally severe, due to the high mileage per day. Many of the points requiring lubrication are inaccessibly located, with the result that they are neglected or else the time required to get at them is too great. The solution may be some form of central lubrication or thoroughly housed constructions carrying a sufficient supply of lubricant for long periods.

The question of riding qualities is also due for consideration. The variation in spring load between a part-passenger load and a full-passenger load is great, and means should be provided to insure comfort under either condition.

Two very important items are body heating and ventilation. The exhaust gas-heating system which has been extensively used in the past will probably be replaced by some system using water or air. Some satisfactory provision to give adequate body ventilation without drafts is also most desirable.

Considering for a moment the more radical design possibilities, there are several promising developments in sight. The double rear axle construction, which has been used for the past few years both in this country and abroad, is attractive from the standpoint of good riding qualities, less damage to road surfaces and ability to carry the maximum loads on pneumatic tires within a limited over-all width. However, this construction involves some difficulties in taking care of the torque reactions from the driving and braking loads. From the standpoint of traffic congestion, the present-day motor coach probably has reached the limit on over-all length. It is possible that future developments may result in a complete relocation of the various chassis units in an endeavor to obtain more seating capacity within the present over-all length.

It is difficult to prophesy the future of motor coach design with any degree of accuracy. The rapid increase in motor coach use has brought about a specialized vehicle in such a short period of time that the engineering fraternity has found it difficult to keep pace with the operating requirements. It is safe to say, however, that the design of the motor coach of the future will be dictated primarily by the demand for safety, comfort and reliability, and it is certain that with close co-operation between the motor coach operators and manufacturers we can look forward to a constant improvement in design, with an attendant reduction in operating costs.

Modern Cars

Effect Economies*

Modernization and Budgetary Control of a System Will Convert a Deficit to a Surplus

By W. R. McRae

Superintendent Rolling Stock and Shops
Toronto Transportation Commission, Toronto, Canada

IT IS indisputable that attractive, comfortable and speedy rolling stock, equipped with safety devices and modern appliances for fast loading and unloading, fare collection, etc., attract the riding public. The car, being modern in itself, is not sufficient from the point of view of maintenance and operation. Modernization must not stop there. To get the best from this equipment, modernization must be carried into the office, shops and car houses in the form of design, equipment organization, system and method. The result of this is lowering maintenance and operating costs and promoting among the personnel a spirit of co-operation, a pride of accomplishment and association, in a modern electric railway system.

On Sept. 1, 1921, modernization of the Toronto Traction System commenced. The Toronto Transportation Commission unified the railway systems, taking over 838 passenger cars previously operated by the Toronto Railway Company and 70 cars operated by the Toronto Civic Railway. Delivery of new rolling stock commenced in October of the same year and continued until the orders for 575 new cars had been completed in August, 1923. These cars included two types of Witt cars and large roomy trail cars. At intervals, 491 of the Toronto Railway cars were scrapped. The remaining 347 cars were of the pay-as-you-enter type, the bodies of which were of such design and in such physical condition as to warrant reasonable expenditure to redesign and convert in a manner that would permit of their being operated under the standard operating conditions adopted on our system, which included a uniform system of front entrance for all types of motor cars.

Modernization did not stop with the redesign of bodies; storage air-brake equipment was scrapped in favor of brakes of the latest design. Obsolete fenders

**Abstract of an address delivered at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Oct. 3 to 7, 1927*

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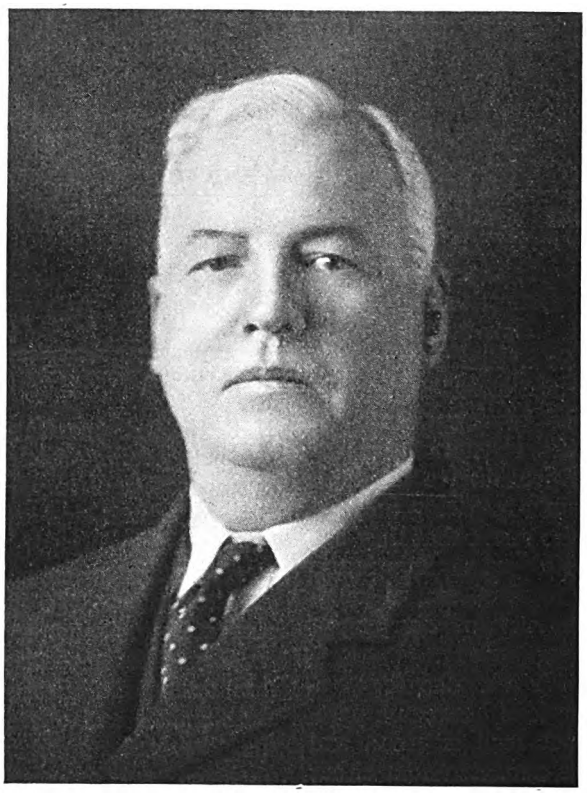
were replaced with life guards. Hand straps were replaced by hand rails. Stoves were replaced by modern heaters. Monitor windows were replaced by modern ventilators. Trolley catchers and tail lights were installed. Manually operated doors were changed to pneumatically operated. On 156 cars spur gears were discarded in favor of helical, and the ratio changed for train and trailer operation.

New shops were designed and constructed, utilizing modern methods in the progress of the work and equipped with modern machinery and appliances. Obsolete car houses were abandoned or rebuilt. Some existing car houses were redesigned and enlarged to correspond in efficiency with the new car houses that were erected.

The I.C.C. uniform system of accounts was adopted, with many subdivisions. The rolling stock department installed a complete cost system in the shops and car houses, together with a system of compiling individual and group cumulative mileage for passenger and service cars, buses and coaches, and a record system for all component parts of equipment that could be identified by numbers. Histories and maintenance costs are kept of the different groups of the modern equipments as well as individual motors, armatures, compressors, etc. Additional new systems were put into force using mileage instead of daily or weekly schedules for inspection, lubrication, etc., and standard practice cards were placed in shops and car houses covering this type of work. Mechanical labor-saving devices, such as adding and calculating machines, filing systems, etc., together with furniture of the most modern type, were installed in a newly erected office building.



W. R. McRae

Budgetary control was adopted by the commission, and it naturally followed that this system of control was applied in its fullest sense by the rolling stock department.

The Hillcrest shops have a labor budget covering each of the 24 pay periods in the year under ten separate headings of maintenance and expense—i.e., maintenance of equipment, passenger car body maintenance, truck maintenance, brake maintenance, service equipment maintenance, electric motive equipment maintenance, shop machinery maintenance, shop expense, miscellaneous equipment expense and conducting transportation.

Each of the eight shop sections, such as motor shop, truck shop, etc., has a labor budget under headings that apply to the work of each section. This requires 40 budgets, each covering 24 pay periods. Fourteen budgets are required for the seven carhouses. Maintenance of equipment and conducting transportation are the only headings used in each division. Within ten days of the end of the pay period labor distributions for each shop section and carhouses have been compared with budget, and reports issued to the chief inspector, master mechanic general foremen and foremen. Amounts are converted into dollars per thousand car-miles and analyzed for excessive expenditures. These results are curved for the purpose of records and comparisons.

The costs of each of the carhouses are based upon the actual mileage of cars operated out of each division. These costs are classified under thirteen headings—i.e., maintenance of equipment, car body maintenance, truck maintenance, brake maintenance, electric motive equipment maintenance, conducting transportation, inspection, car cleaning, car shunting and shifting, car oiling, miles per pull-in, miles per inspection and pull-ins per inspection.

The results are plotted graphically for each carhouse, together with the average costs of the six other carhouses, and blueprinted, a copy of each being sent to the senior foreman for each carhouse. The competitive nature of these graphs creates keen rivalry among the various carhouse staffs and at the same time provides cost data of a valuable nature.

Does this modernization process pay? A comparison of the records shows quite effectively the value of modernization. Over the period of 1923 to July, 1927, inclusive, the reduction in the number of pull-ins for different portions of the equipment was quite substantial, as you will note: Bodies 80 per cent, trucks 64 per cent, brakes 87 per cent and electric equipment 61 per cent. Because of these reductions it is expected that our maintenance of equipment for 1927 will cost $375,000 less than for 1922. The total reduction for the various classifications over the period from 1922 to June, 1927, inclusive, were found to be: Maintenance of equipment, 33.9 per cent; armature maintenance, 59.1 per cent; controller maintenance, 59.1 per cent; electric motive equipment maintenance, 60.8 per cent; labor charged to equipment maintenance, 53 per cent. The carhouse payroll has been reduced 10 per cent since 1924, in spite of the fact that our cars are cleaner and more attractive than at that time. The advent of new rolling stock considerably reduced the paint shop payroll, but the time arrived when repainting became a necessity to maintain the standard of appearance required.

I think that we are unanimous in the thought that modernization is the keynote of the electric railway of today. The purchase of new rolling stock when possible, modernizing old cars when warranted, budgetary control of all expenditures and standard practice throughout the department will convert a deficit to a surplus.

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Automatic Substations Prove Economical*

By W. E. Bryan
Superintendent of Power
United Railways of St. Louis

W. E. Bryan

PREVIOUS comparisons of automatic and non-automatic substations have necessitated an estimate of certain operating economies obtainable with automatic stations, since actual data were not available. I shall attempt to give some actual figures covering such economies on the property with which I am connected, the United Railways of St. Louis.

In 1922, due to increases in the number of cars operated over the system as a whole, a number of our manual stations became overloaded, some to a serious degree. Two courses were open: (1) the installation of additional equipment in existing stations where this was possible, and (2) the installation of the additional equipment in automatic stations located in the districts served by the overloaded stations. We decided on automatic stations, so that we now have seven such stations aggregating 8,600 kw. in capacity. These seven stations effected a reduction in the load of nine manual stations, which indicates the widespread effect of the new stations. These stations have now been in operation for about five years.

In the studies of past years it was estimated that the cost of operation and maintenance of an automatic station, say of 1,000-kw. capacity, would be $750 to $1,000 per year. On a kilowatt basis the ratio of such costs for automatic stations as compared with manual stations varied, as shown by the 1926 report of the committee on power generation and conversion, from 7.1 per cent to 52.0 per cent, with an average of 25.4 per cent. These results proved that even during the initial period of automatic substation operation a material saving was realized on this score.

Comparative data for two 1,000-kw. manual stations and two 1,000-kw. automatic stations in St. Louis, taken from the auditor's accounts, show that the operating and maintenance costs of the two manual stations for the two-year period 1925-26 averaged $3,540, whereas the comparable figure for the automatic stations averaged $1,130. Stated in percentage, automatic operation cost 31 per cent of manual operation. The annual difference of $2,410 in favor of the automatic station on a 15 per cent fixed charge basis would justify an investment of $16,000 for automatic control equipment for the manual stations. However, certain types of manual equipment, built years ago, are not altogether suited for automatic operation, and this is true of the two manual stations referred to.

Power economy is, of course, one of the principal advantages of automatic substations. Most railways purchase power on the basis of a demand charge plus an energy charge. In any study of power questions, therefore, both of these elements must be considered. The use of automatic stations in urban districts tends to decrease the demand figure, as the improved voltage possible with automatic stations, as usually located, permits of more coasting for a given schedule speed. High voltage may increase rheostatic losses at the car, but where considerable free running is possible, the net result is improved acceleration and higher speed. In congested areas, where schedule speed is primarily dependent upon traffic congestion rather than on voltage, high voltage increases rheostatic losses without, however, an attendant improvement in schedule speed. It has actually been found in several cases that a marked improvement in trolley voltage in congested areas has resulted in a serious increase in the power demand with no improvement in operating conditions.

Probably the most satisfactory method of avoiding this condition is by the use of the shunt-wound converters. The two St. Louis stations installed in the heart of the congested district use this method, having a drooping characteristic from 600 volts at no load to 560 volts at full load and 540 volts at 150 per cent load. This arrangement has resulted in holding the voltage at the cars in this district at practically the same figure as existed formerly, so that there has been no increase in rheostatic losses or in power demand. There has been, of course, a marked decrease in the I^2R losses in the feeders. Another advantage of the use of the shunt field is that in case of overload the automatic stations "back off" from the load, which is thus shifted to adjoining stations. This arrangement, coupled with the current-limiting re-

*Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Oct. 3 to 7, 1927.

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sistances at the stations, permits the moving of an abnormal number of cars at reduced voltage under emergency conditions.

As to distribution losses, a feeder section fed from a station located at one end of the feeder has a certain I^2R loss, but with a second station at the other end of the feeder section the distribution loss would be less. On the other hand, with light loads, the operation of both stations would result in light loads on the converters, with attendant decrease in efficiency. The point at which the second station should be brought on the line can be determined mathematically.

The two St. Louis stations in the congested district are roughly a mile apart, and as they are connected by heavy feeder copper, they might be considered as a single two-unit station with an unusually long bus between units. We have set the relays at these stations so that one unit operates somewhat as does the lead unit in a two-unit station, the second unit coming on when the voltage drops to 520 volts. This arrangement has been altogether satisfactory from an operating standpoint.

Another situation often found on street-railway systems where distribution losses are an exceedingly important factor is a long heavy feeder section fed from a distant station. Under normal conditions the distribution loss on such a section is serious enough, but if a blockade of cars occurs, the trouble becomes cumulative. Cars pile up in the section, further reducing the voltage and extending the time during which power must be fed over the long feeding distance. The feeding of such a section from an additional station or stations reduces the demand figure, saves energy and, what is much more important, materially improves operating conditions. It is difficult to evaluate this third benefit in dollars and cents, but no railway man needs to be told that this advantage very often outweighs, in the eyes of the management, those other advantages which involve a direct saving in energy.

Electrolysis Mitigation

All of you are familiar with the effect on electrolysis mitigation of an increase in the number of stations from which the general distribution system is fed. The 1921 report of the American Committee on Electrolysis brings this out very clearly. Our new stations being rather widely scattered, we expected and have actually realized a marked decrease in electrolysis troubles. Our greatest trouble from electrolysis has occurred on underground transmission cables, of which we own and operate 81 miles. Shortly after the first of these cables was installed, back in 1903, we experienced a great deal of trouble due to sheath corrosion where return railway current left the cable sheath. This was easily corrected by installing drain wires so as to keep the cables negative to other earth structures and lead the current safely to the negative bus. This cable was laid in tile or concrete duct.

In 1913, at the time of receipt of Keokuk water power, a large amount of duct of a somewhat porous texture was laid by the local power company, and the new cables laid at that time by the power company and ourselves largely occupied these new ducts. Although the precautions previously in use were taken from the start, serious corrosion of the sheaths developed, this corrosion occurring not in the vicinity of the substations but in those localities where the current flowed to the cables and where the current density on the sheaths was the greatest. This corrosion depended on the amount of current flowing to and along the cable sheaths, and it became necessary to reduce these currents. In 1917, in one of the districts particularly affected, which was fed by a 4,000-kw. manual substation, we installed an insulated return system, which materially bettered conditions, although damage previously done continued to show up.

The distance between substations feeding the district in question and the overloaded condition of these substations justified the installation of two automatic substations between the old manual stations, which reduced the potential gradients along rail, cable, etc., to a small proportion of their former value. The actual cable burnouts for the five years prior to the installation of the automatic substations were 63 for the system and 28 for the lines in question. For 3.7 years subsequent to the installation of these stations there have been 28 burnouts on the system, of which seven were on the lines mentioned previously. The decrease in underground cable troubles was from 12.6 per year before installing the automatics to 7.6 per year afterward. On the section principally affected the burnouts in the two periods averaged 5.6 and 1.9 per year respectively. The reason why the general decrease is not proportionately as large as the decrease in the section hitherto referred to is because the older cables were laid in non-porous duct and did not suffer to the same extent from sheath corrosion as the newer cables.

The approximate net cost to us per cable burnout is $500. The average reduction in burnouts, amounting to five per year, is due almost solely to the increase in the number of feeding points and is therefore a credit to automatic substation operation. Thus we have a credit of $2,500 per year on this score. I might add that the power company has had a comparable decrease in its cable burnouts.

As might be expected, the use of automatic substations brought a decrease in general electrolysis complaints. There was a decrease from a maximum of 51 complaints in 1919 to fifteen in 1927 (to date). For the five years just prior to the use of the automatics complaints averaged 43.8 per year, while since they have averaged 33.2 per year, a decrease of 24 per cent. Based on our average cost per electrolysis claim, this means a saving amounting to some $750 per year, and as damage claims are not particularly conducive to good feeling, this reduction has a good effect on public relations.

Improvement in Operating Voltage

The greater the number of feeding points the higher the average system voltage, and as the new stations are often placed at points of low voltage, the effect on service may be quite appreciable. This effect, because of variation in other conditions, is difficult to evaluate in dollars and cents. Improved voltage on an interurban line not only may reduce the number of cars required to maintain a given schedule but will also, because of increased schedule speed, serve as a means to meet competition of buses and private automobiles. On urban systems, while the effect may not be so marked, any improvement is applied to a greater number of units. Good voltage tends to keep cars on schedule and is particularly valuable in case of blockades. With the present method of feeder control, heavy loads of short duration on individual feeders are carried up to the limit of the safe capacity of the converter, and usually before this point is reached the cars have passed to the territory of an adjoining station.

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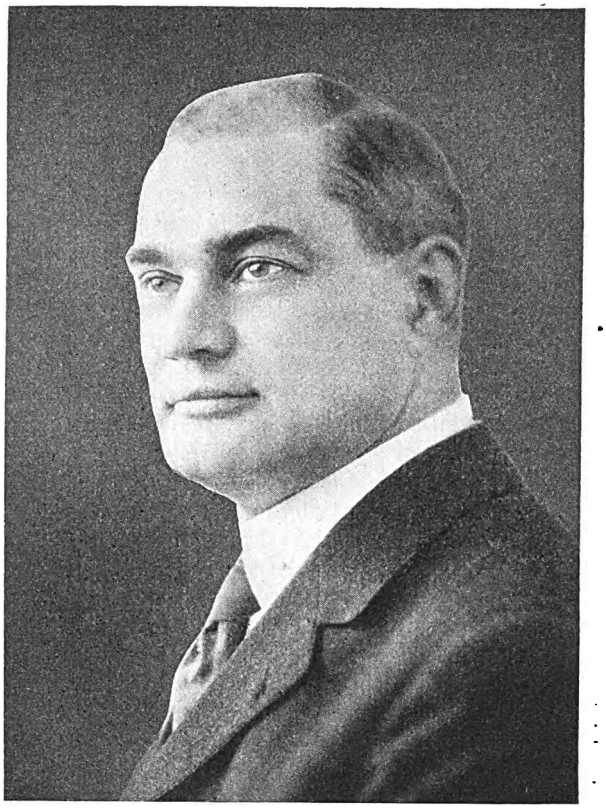
Cost of Crime

to Electric Railways Each Year Is Enormous*

By W. L. Barnhart

Resident Vice-President National Surety Company, New York, N. Y.



W. L. Barnhart

PERHAPS no statement that has appeared in public print recently created quite such widespread interest as did the article by Mark O. Prentis which appeared in the *Manufacturers' Record* a few weeks ago, estimating the cost of crime in the United States today at between fifteen and sixteen billions of dollars. This figure places crime as one of the leading industries of the United States. The annual loss through crime is shown to be greater than the entire foreign trade of the United States, which amounted to less than ten billion dollars in 1926. In fact, our annual losses through these dangerous and brainy criminals who are preying upon the business public are greater than the aggregate value of all the agricultural products grown in the United States during the past year. Crime necessitates the employment of more than half a million people who do nothing else but endeavor to combat the criminals, comprising our police forces, our sheriffs' organizations, our jailers and all the public servants whose occupations are dependent upon crime.

And who pays that gigantic loss? Who is charged with such enormous tribute to the power of the criminal? Why, you and I, and every business man—we all must pay our share. We pay it in taxes to take care of the police and the courts, we pay it in higher burglary insurance rates when criminals become especially rampant in this section or in any other portion of the country. We pay it in higher prices that other business men must charge for their products to repay themselves for their own losses through crimes, and sometimes we pay it through our own lives or the security of those nearest and dearest to us when the modern criminal gets in a corner and, to secure his own liberty, takes without hesitation a human life.

Mr. Prentis estimates the loss due to fraudulent securities at $500,000,000 per year. I dare say that there has never been a time in history when there were as many counterfeit signatures and raised and altered shares of stock on the market as exist today.

Embezzlement is the second big cause of loss. It is estimated that the amount lost annually from that cause is $150,000,000. Embezzlements have been on the increase recently not only in number but in total amounts. One of our investigators told me the other day that whereas losses of $10,000 to $15,000 were considered large five or six years ago, today embezzlements of $100,000 and $150,000 are quite common.

The electric railway field has seemed to prove an unusually fertile one for large embezzlement, probably due to the large sums handled by many utility companies, and due, in part, I think, to lax methods of auditing and checking up accounts of trusted employees. Too often the auditors, cashiers and bookkeepers are left with too few outside checks upon their operations.

The recent experience of a certain transportation company is an example of what might befall any company neglecting to audit its books carefully. When the cashier of this particular company disappeared, a complete audit of the books showed a loss of nearly $70,000. It was learned upon the cashier's arrest that, being successful in covering up a paltry $350 which was stolen from him, he had carried out the practice to the extent of $67,000, all for his own use.

Still another case may be cited—this, in way of contrast, being a quickly negotiated fraud. The paymaster of the traction company involved, with a payroll amounting to $41,000 in his care, slipped away with the entire sum instead of returning to his office, as he had done so faithfully for many years. Craving a part in a speedy gambling affair, he met up with the "type," eager to prey upon his desires. One week was the time required to extract the entire $41,000 from the paymaster.

What were the mental processes of this man who thus in an instant reversed his record of fifty years of blameless living? Who knows? I confess it's too deep for me. But it may be that for years he had suppressed desires for just this sort of thing, for years he had day dreams and night dreams of being able to do it some day —to sit in and play for big stakes. Perhaps that payroll fascinated him and it may have often figured in his dreams as a way of helping him make a big winning. Maybe these suppressed longings, these inhibited desires just backed up in his brain, like water backs up behind

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a dam in the spring freshet, and suddenly when the pressure gets too great the dam goes out, and all that has been held back all these years goes out with a rush, carrying the traction company's $41,000 with it.

Causes of Crime

In investigating hundreds of cases of embezzlement and defalcation, we find the chief causes of crime to be:

1. Speculation and gambling. Probably 60 to 70 per cent of all embezzlers have lost most of their stealings through gambling—on the stock market, through bucket shops or by playing the races. The gold digger type of woman has seemed to become more numerous and more insistent in her demands for jewels, fur coats and all the things that take money to buy. And seldom does she seem to care how her victim gets the money to satisfy her whim, just so she gets it.

2. High cost of fast living and fast women. High life as practiced these days in the large cities is an expensive process. Expensive liquor, high night club charges, speculators' prices on seats for popular shows and so forth, have been a factor in many a defalcation.

3. Liquor and drugs. Those who investigate our claims tell me that there is no question that high cost and poor quality of liquor and the growth of the drug habit have had a great deal to do with increases in crime today.

4. "Keeping up with the Joneses." Extravagant living is unquestionably responsible for a great deal of embezzlement and crime today. Installment sales and long retail credits have made it easy for the average American family to live beyond its income, and the spirit of "keeping up with the Joneses" is in the air. Things go along so far, then bills accumulate and creditors get ugly, and the temptation to steal from the employer may be very strong.

5. Finally, the factor responsible for the least of all our embezzlement crime is actual family needs. Sickness or death or trouble of children or parents may put an unusual burden on an employee and he may steal because that seems to him to be the only way out.

Such are the five chief reasons upon the employee's part. But there are yet three causes of crime for which you must accept actual responsibility and I am not sure that, after all, they are more vital causes of embezzlement losses than anything the employee may be responsible for.

The Railway Company's Responsibilities

Here are your responsibilities for the growth of crime:

1. The employee steals from you because he is able to find a way of doing so without fear of being detected. In other words, your employee, an expert in figures, finds a vulnerable spot in your armor. If he couldn't find a way to steal without fear of prompt detection, he would not become an embezzler.

I should be foolish to attempt to tell you folks, who are professional auditors, how to establish checks and counter-checks on your accounts. Let it suffice to say that every case of loss reveals that somewhere a treasurer or auditor has fallen down in his duty of knowing what is going on. Some loophole has been left unguarded and through it your bank account has been attacked.

Have frequent outside audits made. Get the best talent you can and pay for the best and most complete check-up. It may save you many thousands in losses. Devote some of your thought and energy to finding out yourself what's going on. Go over the books occasionally and draw off some figures for comparison. Any auditor or treasurer worthy of the name should have some sort of personal checking figures that would tell him very quickly that something was wrong when several thousand dollars had been extracted from the bank balance in a week.

Another duty no treasurer should ever intrust to a subordinate is that of going to the bank to get the canceled vouchers and then checking them up with the checkbook stubs. We know of many cases where employees raised or forged checks, got the money, and then went to the bank for canceled vouchers and destroyed the evidences of their guilt before they got back to the office.

2. The second way in which you employers encourage crime is by not knowing enough about the home life of your employees. If more employers had an idea of what their employees were doing after hours, hundreds of embezzlements would be nipped in the bud. In fact, I suppose quite as many defalcations are discovered through the employer accidentally finding out his employee's scale of living or his night dissipations as from any other cause.

We recommend that every employer of labor should have one or more "assistant managers" whose chief duty it would be to mingle with the employees, especially those handling money, and find out as much as possible about them. He should be a man of tact so that employees would never suspect his duties, and he should also have some actual work to do about the place, but his chief function should be to mingle with the men, to go around with them at nights, to learn anything that might be of interest to his employer.

3. Third and last, don't put too much trust in anybody. It sounds wonderfully noble and altruistic to trust everybody, to proceed on the basis that all men are honest. But to believe in everyone has proved costly to many.

Remember this: Only the trusted men can steal. It was that very trust placed in him which gave him the opportunity to steal. And who shall say that it was doing him a kind act to trust him so implicitly? That very trust made him a criminal, an outlaw, despised in the eyes of the world, a betrayer of the faith of his family and his employer, the wrecker of the hopes of his wife and children.

No, my dear men, you are really handing your employees a curse instead of a blessing when you trust them too far. If you won't do so for your own sake, if you won't do it for the safety and security of your own money, you owe it to your employees to insist that they have the added protection, the added stiffening of their moral backbones, that comes through the knowledge that they are bonded by a large surety company that will relentlessly pursue and prosecute them if they do wrong. And if you should decide upon this course, be sure to secure adequate protection. Little $5,000 and $10,000 bonds are hardly a drop in the bucket as compared with the $50,000, the $100,000 and the $150,000 fidelity losses that are so common today.

Wouldn't it have been infinitely better from the standpoint of the employee, from the standpoint of society as a whole and from the standpoint of his employer's bank account to put a strong restraining influence upon the employee, such a restraining influence, for example, as comes from the knowledge upon the part of the employee that he is under heavy bond, that his every act will be checked up by competent auditors and that if he does steal the long arm of organized surety prosecution will follow him, and will bring him to justice sooner or later, no matter how far away he goes or how long he seems to escape immunity from punishment?

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Maintenance of a Large Overhead System*

By M. W. Cooke
Superintendent of Power and Inclines Pittsburgh Railways, Pittsburgh, Pa.

Mass production methods can be applied to the construction as well as to the repair of overhead lines

DISCUSSION of any broad maintenance problem is naturally divided into two parts. First, and most important, are the principles involved and their method of application. Second are the practices that develop as the result of the application of the principles.

Generally speaking, maintenance work is a tinkering sort of operation, with different pieces of equipment, more or less widely apart in location, requiring repairs at the same time and with no apparent connection between the causes or the times of failure. The problem is further complicated by the wide variety of things a maintenance mechanic is expected to be able to do.

M. W. Cooke

It is small wonder, therefore, that construction work is much more efficiently organized and handled than maintenance work. The desire to build things or to be mixed up in construction is common to all of us. Even as children we got pleasure out of building things, but few of us took care of our blocks when the game of building was over.

The development of the building or production instinct has resulted also in the development of a production technique. Relatively small numbers of men now produce vast quantities of material as the result of that technique. The technique is the combination of such principles as standardization, specialization, functional organization, and so forth, and the final result is mass production.

If this sketchily drawn contrast between the tinkering methods of maintenance and the production methods of construction really exists, it is obvious that maintenance work can be vastly improved and simplified.

A large railway system covers so much territory that the natural tendency has been to break the line maintenance crew up into small units and place the units at different parts of the system, in much the same way that the cars are housed at different parts of the system. This is the so-called district or division form of organization. The number of men is small and the variety of the jobs large, so that there is little opportunity to put the work on a functional basis and secure the benefits of specialization.

If it were possible to pick the entire railway system up and put it on a conveyor, it would also be possible to have repairs made as the several parts passed the men whose specialty it was to repair each of them. The problem of having an adequate supply of machinery and tools would be greatly reduced, because it would be necessary to have them at only the one place. The problem of supplying material with which to make repairs would be reduced for the same reason. Supervision would be made so simple that instead of the supervisor spending his time and energy locating the men out on the system he could spend them studying and organizing the work so as to secure ever-increasing efficiency.

It is, of course, not possible to put the railway on a conveyor, but it is possible to run the equivalent of a conveyor past the railway. By consolidating men, machinery, material and supervision and moving the combination over the system as a unit it is obvious that repairs can be made more efficiently than by having the component parts of the consolidation working at widely separated places. After the method has been in effect long enough, it is reasonable to expect either a higher standard of maintenance for the same cost, or the same

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standard at a lower cost, or both higher maintenance standards and reduced costs. Human nature being what it is, a reduction in costs and a better standard of maintenance will both be secured. The psychological basis for that statement is well known.

The adoption of this method will involve some difficulty, and it is to be expected that troubles will develop which will result in pressure tending to break it down, especially during the transition period. Undoubtedly more failures will occur while the tinkering process is being tapered off and the mass method is not fully in effect. However, unless both methods can be afforded simultaneously, there will be nothing to do but grin and wait for better results to follow.

The organization of the line department to secure the best results by using mass production methods will vary somewhat with local conditions. It is essential that it be organized on a functional basis, so as to secure the benefit of specialization. The work can be divided on the basis of routine and emergency, or usual and unusual, or, in more familiar language, repair and construction. These jobs that have to be done over and over again, are to be assigned to the group doing the routine, usual or repair type. The other jobs are to be assigned to the group doing the emergency, unusual or construction type of work. To illustrate, the changing of ears or of span wires is a routine job, while the stringing of long renewal sections of trolley wire is a construction job. Another way of looking at this division of work is to consider it from the standpoint of size. A small job will fall in the repair classification, a big job in the construction classification; the whole point being that the work assigned to the floating mass production crew is such as not to delay it unduly, and thus interfere with its prime advantage, which is its rapid rate of movement over the property.

The rate at which the crew moves will depend on the amount of work which has to be done. This rate can be varied to suit the requirements of the job by varying the size of the crew and the amount of equipment assigned. It is to be expected that it will take longer to go around the first time or two than it will on later trips, because the first few trips will plow into the system a backlog of material the renewal rate of which is low.

Careful judgment will have to be exercised on the initial overhaul trips not to renew material which might reasonably last until the next time around. If there is any doubt about a given piece of material, it should be changed as a matter of course.

Since the schedule is set up on the basis of the length of time the most rapidly wearing part will last, it is obvious that a fine sense of judgment will have to be exercised with reference to the parts that wear longer. Some will last two or three times as long and in the interest of economy should not be renewed. In order to preserve the efficiency value of the grouping of men and machinery, the work to be done should be laid out for the crews, so that no time will be lost inspecting and debating about the renewal of a given piece of material. This laying out can be done by having the line inspected in advance of the arrival of the crew, and the parts for renewal marked, or a list made of their kind and location. Such a list from a compenent inspector will enable the supervisor in charge of the crew to assign the work in advance to each unit, and the whole job can then proceed without delay.

The schedules being set up on the basis of the life of the most rapidly wearing part, that part now assumes a value not before recognized. Obviously, if by substituting another type in its place, or by redesign, the life can be increased, the overhaul period can be lengthened and further economy achieved.

It is to be expected that as a further result of this method the ratio of labor to material in the cost of line maintenance will change—that is, it will be necessary to spend less money for labor—although in fairness the rate of compensation per man should be increased, while the amount of money spent for material should decrease. Generally speaking, the cost of labor in line maintenance work is greater than the cost of material. If the method advocated here were successful, the spread between these two items should narrow and probably closely approach.

Just where the two should stand with reference to each other is probably impossible to determine accurately and will vary with the cost of both labor and material, but it is certain that as the spread between the two is narrowed the condition of the plant should improve.

Lack of time prevents the carrying of the discussion over into the construction phase of the maintenance problem, but it would appear that by suitable modification the same mass production method might be applied.

Development of methods of this kind not only should prove economical to the railways company but should at the same time improve the quality of the service to the public and the condition of the men who do the work.

Handling Passenger Revenue*

By Horace L. Howell
Consulting Engineer, Meyer & Wenthe, Chicago, Ill.

RELATIVE merits and the possible economies that may be effected in the accounting and auditing of passenger revenue, based upon the use of metal fare tokens, versus the use of paper tickets, in transacting fare payments, are of interest.

The first economic value gained with the use of metal tokens, as compared with the use of paper tickets, is in the initial or investment cost. The initial cost of the tokens is chargeable to capital account, since tokens are indestructible and therefore are a part of the company's physical inventory. On the other hand, the cost of paper tickets is an operating charge, the paper ticket being used but once to transact the single fare payment.

On most properties it is found that the single token is put into circulation about 50 times, or once each week, during the year; this means that the cost of the average paper ticket will be materially greater than the initial cost of the metal token over a given period.

The amount of the second economic phase resulting from the use of metal tokens depends primarily on the physical arrangements of the property—that is, the system of fare collection employed; the rates of fare; the provisions at receiver's or main office, and the size of the company.

The important and vital work of checking through the earnings can be accomplished more economically, faster

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H. L. Howell

and with a greater degree of positiveness through the use of "all metal" fares and mechanical auditing methods than with paper tickets, regardless of what provisions are made to separate and count the latter.

The labor cost incident to manual sorting, auditing and destruction of paper tickets is considerable. The process is slow and involves added handling and detail, whereas the metal tokens can be sorted and counted with approved accounting machines more rapidly and with less handling, thereby effecting a saving in the labor payroll.

The question frequently arises as to whether or not it is necessary to obtain a new supply of metal tokens with the inauguration of a change in the commutation fare rate. This is a matter of importance and is worthy of comment. When a change in fare becomes effective, there will naturally be a quantity of tokens in the possession of the riding public, representing tokens previously sold but not as yet collected in fare payments. This condition will prevail whether the change in fare rate is increased or decreased. At no time, however, will the actual turn-in of these unredeemed or unused tokens ever approximate their full 100 per cent book value, since there will be a considerable number of these outstanding tokens either lost or carried away. In the event of a reduction in the commutation rate of fare, the probable gain from this transaction would offset the probable loss that might occur with the inauguration of an increased fare rate.

In connection with the operation of any property having a commutation or reduced fare rate, there will undoubtedly be a collection of a number of foreign tokens. The amount of volume of such collection of foreign tokens will vary somewhat in proportion to the size of the operation, the number of reduced fares in daily circulation and the proximity of the railway system to other reduced fare operations.

I am advised that our association now has this matter in hand and is concerned as to what should be done to best take care of exchange settlements for foreign tokens between member companies.

The writer avails himself of this opportunity to state that he is an ardent advocate of the establishment of but two adult rates of fare—that is, a cash and a commutation rate of fare. The differential between the cash rate of fare and the commutation or token fare should be as wide as possible, since it would then tend to re-establish the single coin unit form of fare payment and facilitate platform transactions and permit of economies in the accounting and auditing of the passenger revenue. This system of fares would also expedite passenger platform movements and would in turn be reflected in the car schedules.

In conclusion, it may prove of interest to note briefly the relative advantages and disadvantages of the use of both paper tickets and metal tokens as follows:

Paper Ticket Fare

Advantages—Good for handling in large quantity sale lots. Useful for clearly stating fare rates and privileges. Good for hand collection, since canceling with punch is obvious by inspection.

Disadvantages—Can be counterfeited without great effort or expense. When sold in strips, can be torn short and thereby obtain more tickets than to which entitled. Can be split, thus making two tickets from one. Not conducive to good accounting—thus affording opportunity to peculate, holdout and resale. The printing charge is a recurring operating expense. Requires considerable labor for sorting, counting, destroying, etc. Makes for slow auditing. Less sanitary.

Metal Token Fare

Advantages—One investment in tokens will suffice for years, since they are indestructible. They lend themselves to mechanical accounting because of uniformity of size and shape. Difficult to reproduce. Metal basis gives them a greater intrinsic value. Speedy for transacting fares on platform with changers. All fares are metal. Makes for quicker and better mechanical auditing, thus reducing labor cost.

Disadvantages—Bulky in weight for large quantity sales. Limited at present to but four distinctive size diameters, other than those of standard coins.

The noblest religion in business is downright honesty and square dealing, which means giving a dollar in value or service for every dollar received.

—Dr. Alfred W. Wishart.

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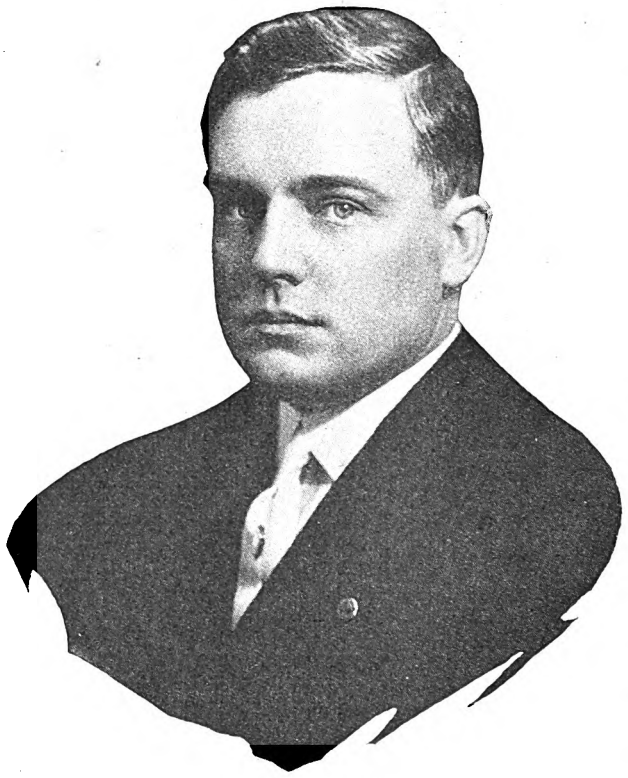
"The Claimant's Doctor"*

How May He Be Convinced of the Company's Fairness and His Friendly Co-operation Enlisted?

By Hart E. Fisher, M.D.
Chief Surgeon Chicago Rapid Transit Company,
Chicago, North Shore & Milwaukee Railroad and Other Companies

THIS subject is primarily one of public relations between a transportation company and its customers, the traveling public. The successful claims man and his assistants can make more true and loyal friends for his company by cordial business intercourse with claimants, than can any other official or department. High-handed, high-pressure, critical and gruff tactics can make more and lasting enemies than all other employees combined can counteract.



Dr. Hart E. Fisher

When a person is injured, be it trivial or serious, he may be so mentally disturbed that he will do and say things that he never would have done or said in calmer moments. Many people are ignorant of the methods of big business and its routines, and when under stress of an accident they are afraid if they say anything regarding their injuries that their words will be misconstrued and used against them in suit. The past performances of unscrupulous employees in claims work in making small settlements of cases, the rough treatment that many claimants experienced at the time of making settlements, the suspicion evidenced on the part of the claims men that claimants are malingering, have all been magnified by the average claimant, with the result that the old, obsolete claims methods are the ones that he has in mind when he is injured. It is up to each one of you as executives in our industry to eliminate from your personnel those employees who do not have the milk of human kindness and the business finesse essential to successful claims men. A settlement, made with a claimant who goes away dissatisfied and settles his claim in a frame of mind that it is the best he can do under the circumstances, is a costly investment, many times over what a satisfactory settlement of a few more dollars would cost, besides losing a friend to the company in future contact.

It may be asked, what has this got to do with the confidence and co-operation of the claimant's doctor? The answer is—if we secure the confidence of claimants in our honesty, fairness and good intentions, this mutual understanding will very quickly be inculcated in the claimant's doctor and he, in turn, will have confidence in the fairness of the claims men and the company we represent. You cannot convince a claimant's doctor of our honest intentions if his patient tells him of unpleasant contact with other employees of the company. This confidence grows by the speed with which medical aid is secured, the dispatch with which the patient is removed to his home or a hospital, the attitude on the part of the medical man summoned by the company, the thoroughness with which an examination and treatment is instituted and the speed with which the claims men get on the job to be solicitous as to the comfort and needs of the patient. There is plenty of time for a settlement later, if we gain the claimant's confidence in the heat and excitement of the accident, or soon afterward. The time to prepare the patient for settlement is when he is comfortable and calm.

The claimant's doctor now enters the scene, either by request of the claimant or the company itself. If you secure the name of the claimant's doctor at the time of injury and then invite him on the case at once, you will show by this action that you have nothing to cover up and that you value his aid. In most cases this places the claimant in a more receptive and confident mood as to your real intentions. If it is a liability case, it is best to have your own surgeon working in harmonious union with the claimant's doctor. Do not quibble about the doctor's expenses and the hospital bills, but give free rein, just as you yourself would expect to be treated and cared for if some other company was liable for your being

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injured. Keep claim adjusters away from the patient until he is discharged, cured or healed as far as medical and surgical science can do. If the patient is turned over to his family physician, keep your interest up in the case, but do not belittle the doctor by sending so-called experts or examiners out to check up on him, under the guise of securing an examination. Untactful, pompous doctors, feeling their importance, having an attitude of suspicion as to the patient's real injuries, who are sent by the company to consult with the claimant's doctor, have done more to cause a feeling of distrust and resentment on the part of the doctor than anything I can think of. Treat the physician on the case in an ethical manner, value his opinions and you will get his co-operation. Do not permit claim adjusters to call up the claimant's doctor promiscuously, making suggestions, asking for information as to treatment, or asking him when the claimant is ready to settle. This may seem a trivial matter to you, but is resented by the attending physician as a transgression on his professional rights.

See That the Physician Is Paid

When the company calls a physician to an accident or sends the case to a hospital it should guarantee the doctor and the hospital that all bills will be paid up to the time they are notified to the contrary. Failure to pay initial expenses after it is found that there is no liability makes a doctor belligerent, and hard feelings arise that bode no good for the company in future contact and co-operation will be found lacking. You hate to lose a dollar, so why should you expect the doctor or hospital to hold the bag and lose by your transaction when, by nature of their profession, a great deal of their work is done without compensation. Furthermore, each hospital has on its staff doctors who are located in the vicinity, and they are as a large family. When the hospital or one of the staff has difficulty with a claims man or a surgeon sent by the company, it will be spread over the entire hospital. One doctor's grievance becomes the grievance of the others, until sentiment in that hospital is antagonistic toward the company and your cases are not wanted. Your next claimant's doctor may be on the staff of some hospital that has had unpleasant relations with your company, and you will suffer in securing his co-operation. If the doctor is antagonistic you can be sure that the patient he is treating will look upon your efforts with suspicion.

Many times a claimant is not honest with his or her doctor, and after a settlement is made for a stated sum plus the doctor's bill, the claimant does not pay the doctor. You say that is no concern of yours as you have paid the full sum to the claimant. That doctor's advice and treatment have made it possible for you to make a settlement economically, and you want to hold his good will against the day when he might again be a claimant's doctor. How easy it is to ascertain if the physician has been paid when you settle with the claimant. Get in touch with him so that he knows you are at least trying to safeguard his interests. He will appreciate your efforts and be glad to assist you in the future. Another good practice is to assure the claimant's doctor that you will take care of his bill when the case is settled, so he will not have worked in vain, should the claimant fail to pay him for his services.

I have purposely refrained from mentioning claimants and doctors who are not honest with the company or have what is known as "blind" cases, but you can secure even their co-operation if your attitude is right. No matter how guilty a man may be, he does not relish being considered a crook or a fraud. If he can be made to look at your side of the case and if you have the services of competent surgeons, he will, of necessity, modify if not retract his claims as to injury. The fault most common in handling these cases is to permit this class of doctor to see that you believe they are frauds. They assume the rôle of a discredited doctor and so confide this to their clients.

When a claimant's doctor sends his bill to you for services that have been rendered a claimant, do not take the attitude that his charges are exorbitant. This puts the doctor in the light of having wilfully padded his bill. If he reduces the bill in order to secure the money without suit, he will remember this the next time he has contact with one of your company's claimants.

When a claimant makes a settlement under stress, which is unsatisfactory to him, be careful, as he may be the relative of some physician and in the future you may have the unpleasant sensation of having this doctor attend a claimant. Most likely, he will recall the poor settlement or inadequate services rendered by your personnel and advise his patient of the fact, thereby creating antagonism in an otherwise fair and honest claimant.

Spread your medical and surgical cases among the general medical profession in your locality and do not depend upon the services of a chosen few who are given the bulk of the work out of friendship, or because they make calls at a low figure. This makes the future claimant's doctor feel that he is slighted. Make as many friends as you can in the entire medical profession. It is better to have too many doctors making calls for you than to have one doctor disgruntled because favoritism is shown to a few of the elect.

Very often, in all sincerity a doctor advises a claimant to settle with the company as he believes the patient has recovered or that there is no possibility of any future disability resulting from the injury. The claimant settles in good faith. In a short time some unforeseen condition arises resulting from the injury, and the patient is forced to undergo further medical attention and asks for further aid. If you call in his doctor, offering assistance toward putting the patient in good health, you make lasting friends of both the claimant and his medical advisor, and the return in friendly public relations for your company is tenfold over the additional money spent by you after the case was settled.

Treat the Claimant's Doctor with Consideration in Court Examination

Testifying in court is an event that no physician relishes and he consents to appear as a witness only on account of his obligation as the claimant's doctor. This is where many an otherwise friendly and open-minded physician becomes antagonistic and resentful against your company, which in turn means your claim department, by the fact that you permit a so-called expert medical witness to place the claimant's doctor in the position of telling an untruth, and the trial attorney attempts to make a monkey out of him before a jury, by his confusion. Remember, the jurymen are each forming an opinion, and it is human nature to be on the side of the under dog. Sympathy for an honest but confused doctor on the stand at the mercy of superior cleverness and legal intelligence has been the deciding factor in a verdict for the plaintiff, and at the same time a life-

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long enemy is made for your company. A little more tolerance and consideration should be shown the claimant's doctor on the witness stand.

I believe all men have open minds, and will co-operate when they know all parties concerned are acting in a fair and honest manner; but allow discord to creep into this harmonious circle by some suspicious or untactful error, and then there is cause for lack of confidence and co-operation. I believe that the friendly public relations existing today will make the settlement of claims easier in the future, and claims men will experience the satisfaction of knowing that each settlement has been the means of making many new friends for their company.

Co-operation

Among Public Utilities in Local Territory*

By C. B. Hardin
General Claim Agent
United Railways of St. Louis

NEVER has there been a time within my experience when the active co-operation of men in our line of business was so imperative. The alignment of the crooked doctor with the crooked lawyer has stimulated the presentation of exaggerated and fraudulent claims against public service companies, automobile owners and industrial plants, sometimes of claims against several different companies by the same parties. The passage of a workmen's compensation law in our state lately has increased the activity of the ambulance chaser in the solicitation of public liability cases. The growing indifference to perjury by those in charge of our law-enforcing agencies is quite noticeable, and the increasing political power exerted by the ambulance chaser and his henchmen has given more power to him in the courts and over judges.

There are other important reasons for our co-operation. The claimant of no unusual prominence collects from some local company for a bona fide injury. Later he has another accident in which my company alone is involved. He does not publish to the world his former claim experience nor the injuries sustained therein, and I may pay him again for some former injuries certified to by his physician working hand and glove with his attorney. I am next confronted with a "No Report" claim. No amount of investigation has developed any information from our employees. If I could go to a properly functioning central bureau, I might find that he has had a previous claim against some insurance companies' assured, or against the city on account of some sidewalk case, or against some other public service company—all "No Reports." If so, I should be in a much stronger position either to decline the claim or to make a cheap settlement.

Then a central bureau is a splendid check on your own business. Handling 10,000 new claims a year does not permit you or the members of your staff to remember the repeaters nor the experience you have had with persons in the same block or immediate neighborhood. A proper filing of your record cards both as to name and address gives you this information at a glance. We know we often have to combat the bad influence of an improvident settlement in a neighborhood, yet if fully informed, we may sometimes be in a position to invoke the aid of a satisfactory settlement or the satisfactory ending of some litigation, to our advantage.

So far we have been unable to get the co-operation of some of the other public utility companies in reporting their personal injury claimants, and none of the insurance company adjusters seems to be interested. I could cite from my files a number of instances where money could have been saved for my company had the records of the claimants with other local companies been available. You may say, "Well, why didn't you dig up such records?" In reply, I say, "Unless such records are voluntarily sent to a central bureau, you cannot cover by one-half the local field. You cannot obtain authority to employ sufficient help to do this and it would be impracticable to have personal calls made on each other company on every personal injury claim."

Means of Getting Co-operation

In what way can co-operation be best accomplished?

First, by the organization of a central index bureau to which all the liability insurance companies and public service companies in the local territory report the name and address of every personal injury claimant. Such a bureau could be operated for $200 per month. In a small city the expense would be lower. It should be consulted by the various companies on every personal injury claim. My company has maintained such an index for many years at its own expense, furnishing free information to anyone who will promise to report personal injury claimants. We put everything in it: personal injury claimants, divorces, newspaper clippings, damage suits against others as well as our own, unusual happenings, adverse witnesses, including doctors, jurors who serve on our cases, property claims declined, inquiries from other cities and records of any crooks.

Second, by frequent informal meetings of the local adjusters of insurance companies, the chief representatives of the claims departments of the public service companies and anyone else who might be interested in our work. The acquaintances made and friendships formed through the meetings are most valuable.

Why do we have to work so hard to get this co-operation? In the first place, the insurance companies have not the same incentive to keep the cost of their settlements down, for if their claim experience with an insured is bad, up goes his rate. Adjusters of many insurance companies are permitted to take outside business, so do not hesitate to represent any of their assured and their guests or their employees against other insurance companies or public service companies. Then the adjusters of some of the small public service companies have only a few claims to look after and are not impressed with the seriousness of the situation that now confronts us. For the last two years I have paid out for my company nearly 7 per cent of its gross earnings in the investigation, adjustment and defense of claims of every character, and this year it will not be much better. Some measure of relief will have to be found.

**Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Oct. 3 to 7, 1927.*

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The Company Doctor and the Professional Medical Witness*

By John A. Leeming, M.D.
Medical Counsel Chicago Surface Lines

IN DISCUSSING "The Company Doctor and Litigation," I shall make some reference also to "The Claimant's Doctor." Consider briefly an injury which may develop into a case of neurosis: A woman is hurt in a street-car accident. No bones are broken, but she is bruised, scared and shaken up. She calls her family doctor. Suppose he makes little of the injury and its effects; he uses appropriate measures to relieve the pain and soothe the bruises. He discourages any suggestion of a claim for damages, encouraging his patient to believe that the company will treat her with perfect fairness. It is safe to say that under these circumstances the outcome of the case would be just the same as if the injury had occurred by the patient falling on her own kitchen floor, which means in all probability that in two to four weeks the whole incident would be a thing of the past.

But suppose the family doctor is hostile to the company's interests, even at the expense of his patient's speedy recovery. Such a medical man usually has but little difficulty in bringing about in his patient's mind a condition of introspection which leads her to dwell upon and magnify her symptoms. He makes it known that he has had cases of this kind which were followed by serious and permanent after-effects. He drops the remark that, as he understands it, the company is absolutely liable, and he sees no reason why it should not be made to pay for its carelessness. In such an atmosphere this type of claimant's doctor has much to do with the progress and outcome of the case.

The company doctor must also be considered, but his connection with the case will be considered later.

Then we have "The Professional Medical Witness." I wonder whether we all have the same understanding of what is meant by a professional medical witness. A marked distinction should be made between a professional witness and an expert witness, not only in the medical but in any other learned profession.

The true professional medical witness as a medical man who is ready to sell his evidence for money. To be a success in this line he must necessarily adapt his goods to the purchaser. In other words, he must please his customer if he is looking for more business from the same source. Let us look into this matter and see how it works. I have medical men in mind who correspond to each one of my fingertips. If necessary, I could name them and describe fairly accurately their individual methods, but they are practically alike in all essential particulars. They all "stand in" with one or more plaintiff's personal injury lawyers.

A close relation exists between such lawyers and medical men. They refer cases to each other, and it is well understood between them that while the doctor does no business on a contingent basis and he must be prepared so to swear on the witness-stand, yet he never thinks of sending a bill for services unless a verdict is returned against the defendant. The usual setting is something like this: Take the case described above. The case gets into the hands of a lawyer. He listens to her story and makes arrangements for her to present herself to the doctor who is later to appear in her behalf as a professional medical witness.

The doctor proceeds to examine her, and listens patiently and encouragingly to the list of subjective symptoms, even though he knows full well he will not be permitted to testify to them in court but will be, or should be, limited strictly to objective findings. Why does he favor the relating of all the subjective stuff? He will not say, though he has his reasons. A certain plaintiff on cross-examination, when asked if she had told the whole story of her sufferings to the doctor who had examined her a few days before trial at the request of her lawyer, replied, "Yes, the doctor said I should go over the story as often as possible so that I would have it down 'pat' for the witness stand." But there are other reasons. The professional medical witness writes a report to the lawyer, but before doing so he tells him over the phone that he finds very little objectively—increased reflexes and an appearance of nervousness—but he says she tells a fine story of her pain and suffering, and if this story can be presented to him in the form of a hypothetical question embodying also his few objective findings, he would be able to answer the question and express the opinion that the hypothetical individual was suffering from traumatic neurasthenia.

Cross-Examination of the Right Kind

How are you going to nullify the effects of such evidence? There may be various ways, but the first step in this direction is by the right kind of cross-examination. I advocate showing the close relationship between the witness and the plaintiff's counsel; that the case was sent to him by the lawyer for the express purpose of preparing himself to take the witness stand and testify in her behalf; that he has done the same thing in other cases for the same attorney. I recommend next that he be examined closely on the hypothetical question, making him admit that in his replies he did not take anything into consideration which was not contained in the question, that in answering it he was not influenced in any way by what the plaintiff told him and that his responses referred to the hypothetical person only and

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not to the plaintiff, that he assumed to be true everything stated in the hypothesis, that if the assumed facts were not correctly stated in any essential particular it might change his answer, that he assumed as stated in the question that until the time of the accident the hypothetical individual was a perfectly healthy woman.

In reference to his examination, I would ask him if he had sent a written report of his examination to the lawyer, whether he has a copy of it with him and, if so, would he object to producing it. When this is evaded or declined, I like to hear defendant's attorney inquire whether the witness has described everything he did in his examination, if he has told everything he found objectively, whether he learned while taking the history that the plaintiff was well until this accident occurred, and then follow this line of cross-examination by directing attention to the objective evidences described. In the sample case under consideration these evidences were an increase in the reflexes and an appearance of nervousness. There may be given other alleged objective signs such as limping, muscular rigidity, rapid pulse and heart action, etc.

It is a difficult and somewhat risky task properly and safely to question a real professional on these symptoms. Let me suggest a rule which I have presented to my class in law school for many years: Never question an adverse witness unless you are satisfied that his answer cannot hurt you but may help you. Some of you will say, "That is an easy rule to state, but a difficult one to put into practice." I am willing to agree with this, but if men engaged in this line of work should fall down because of this or other difficulties daily encountered, they would be prostrate most of their time.

Let me suggest the following line of questions and invite your criticism as to whether they would be safe or whether the answers thereto could hurt your case.

Doctor, what is an objective symptom?

Do you agree with this definition, an objective symptom is one which the examining doctor can discover without the aid of the patient and which cannot be simulated by the patient?

Do you think "an appearance of nervousness" is purely objective?

Have you not seen "an appearance of nervousness" with somewhat increased reflexes in women who have never been injured?

In such cases will you name some of the various causes which might produce it—not too many, on account of the time required—but give the jury about a dozen of the most common ones.

In answering the hypothetical question, did you exclude all such possible causes?

In making your examination of the plaintiff did you make a careful investigation that enables you to exclude all such causes in her case?

Did you examine the pelvic organs, the rectum, the urine, the blood or take the blood pressure?

Do you know whether this woman has any local foci of infection in her teeth cavities, tonsils, accessory sinuses of the upper air passages, appendix, fallopian tubes or gall bladder?

[If on direct testimony the doctor has omitted to mention a pelvic examination and upon cross-examination he says he has described everything he did and all he found:]

Do you know whether this woman has any local pelvic irritation resulting from laceration of the cervix, endometritis, anteflexion, retroflexion, uterine prolapse, salpingitis or ovarian displacement?

In your experience as a medical man have you ever come across cases in women who suffered from backache, headache, increased pulse, excessive reflexes and an "appearance of nervousness" that was due to or might have resulted from any of the pelvic disorders above named?

Suppose the plaintiff in court has concluded the presentation of evidence and announces, "We rest." And suppose further that as a doctor acting in the capacity of the company's adviser you feel convinced that the plaintiff's medical case is vulnerable and can be successfully attacked, how do you proceed? My method, after studying carefully the plaintiff's case during its presentation and deciding what I believe to be a more plausible and accurate explanation of her physical condition, is to recommend putting on a strong medical defense based upon defendant's theory. Do not be satisfied by simply offsetting plaintiff's doctor with a medical man who will offer a counter-opinion. Back up your judgment by opposing plaintiff's medical theory with two medical expert witnesses to her one, or three to her two, as the case may require. Prove this part of your case by a preponderance of the evidence. If properly done, this should be convincing to a fair-minded jury, and if it fails, your record is in much better shape for a reviewing court. In addition you should use your best efforts to outdo the plaintiff in the quality, standing and experience of your medical witnesses. Confer freely with the company's trial attorney; assure him that the theory you have outlined is confirmed and borne out by the experience of the best men in your profession, and if he so desires, make full notes for his use while questioning your doctors. Your final step in preparation is to consult with competent, high-class and skilled specialists—surgeon, internist, gynecologist or neurologist—and in this way back up your contention by presenting to the court and jury convincing evidence by real medical expert witnesses.

I think I am safe in saying that in compensation cases in our state 50 to 60 per cent of the reversals by the Supreme Court are based upon the medical theory introduced by the respondent as being more plausible and reasonable, the language of the court in substance being: "We cannot confirm an award based on speculation, conjecture or doubt."

THE accident cost to the street railways of the country growing out of motor vehicle operation is not far from $20,000,000 annually, to say nothing of the cost resulting from collisions with persons on foot who use the highways, or the loss of lives and limbs to individuals.

—RUSSELL A. SEARS.

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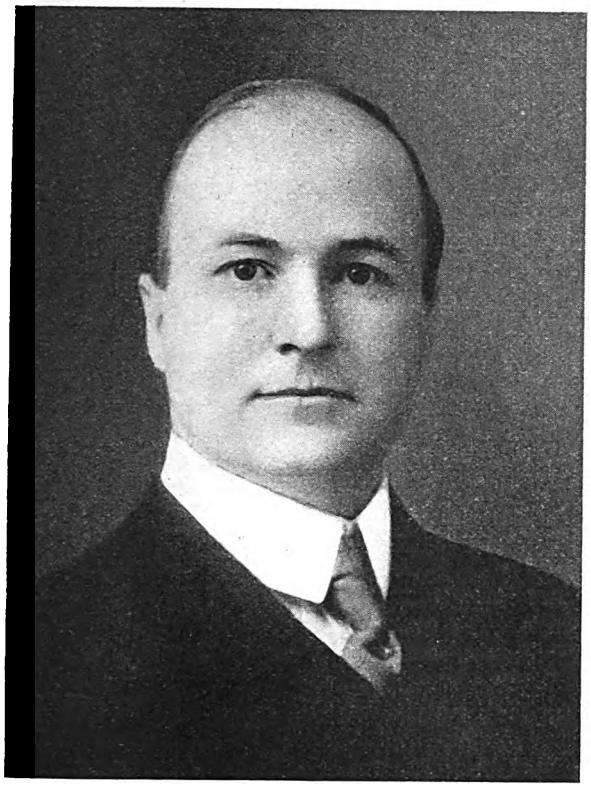
The Company Doctor and Litigation*

By Benjamin E. Sibley, M.D.
Surgeon Boston Elevated Railroad



Dr. B. E. Sibley

MY EXPERIENCE indicates that a standard form of accident report is of great value, since its main divisions may be made comprehensive enough to cover all cases and by following the form the examiner will always be reminded to secure and record data relative to every phase of each case. Such a skeleton report may well express the views both of the company doctor and the company attorney on what information the doctor's report should contain. A blank form I am using, at present, is as follows:

Name, address, occupation, age, date of injury, date of examination, place of examination, those present at examination, claimant's physician, physician's statement, claimant's story of injury, past history of claimant, physical examination, conclusion and opinion.

Without attempting to discuss each of these headings, let us consider first the physician's statement.

The statement of the claimant's physician is important, because it gives us the first information about the nature and severity of the injuries sustained. The sooner after the accident it is secured the better. Furthermore, getting definite statements about what the physician found soon after injury puts him on record, before his impressions are changed or modified by the afterthought of the claimant, his friends or his attorney. Such an opinion, given early in the history of a case, will more nearly represent the doctor's real views than one obtained later or given for the first time at trial.

After the doctor's statement I get the claimant's story of how his injuries were sustained. This inquiry should be painstaking, to bring out clearly just how the injuries were received, the direction of forces operating to produce trauma, the force of blows, etc. It is very important to quote the claimant's own words on many points.

With this story in mind, the examiner will quickly note whether the injuries he finds are reasonable results of the accident or whether the alleged injuries are not of such character as to be caused in the manner described.

Here again an early history is important and the exact quotation of the claimant's words most valuable. His exact words, describing his injuries, incorporated in the original report help to prevent enlarged claims later and convey to judge and jury a strong impression that the claimant actually did say just what the doctor's report states and not that the doctor got a wrong impression or only part of what the claimant meant to say.

It is well, however, for the examiner to be on his guard, in taking down the story given, not to present in his report a picture which the claimant or his lawyer is drawing for him. I mean that a clever attorney may coach his client in the kind of a story to tell and the latter may get the examiner unwittingly to overload his report with tales unfairly favorable to the claimant.

I conclude this portion of my report with a concise list of the claimant's present complaints. This group has a tendency to grow and at trial may hardly be recognized, so that the list made at examination may serve as a valuable check.

I also make a brief inquiry into the past history of the individual. Even if the past history seems to have no vital bearing on claims made at time of examnation, it may have a vital bearing on claims made at the trial.

Former injuries or diseases may be noted, which are caused by pathological conditions, alleged to be the results of recent injury. Or, if such happenings are denied, information from hospital records or other sources may establish the fact of former injury as the cause of present disabilities, and this will weaken or destroy the claimant's credibility.

Physical Examination

The physical examination should be comprehensive and include more than the parts alleged to be injured. A brief but adequate picture of the entire patient should be given, with a careful, detailed description of the parts injured. The doctor should record conditions just as he finds them. He should not try to minimize them but endeavor to give them their true value. Upon his statement of injuries found the claims agent depends in settling cases and paying damages, and the company's attorney depends in deciding whether to fight the case or not. As important, also, as a true picture of injuries found is the doctor's opinion of their importance and their probable after effects. I find it advisable many times to give a supplementary, confidential report, not embodied in the formal one. This document may contain views which could not wisely be put in a report that might appear in court.

For example I might wish to state that certain symp-

*Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Oct. 3 to 7, 1927.

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toms following injuries, such as dizziness, headaches, etc., often persist for long periods. It is manifest that for the company doctor to include such remote possibilities in his report of a particular case where there was no actual likelihood of them being true, might prove unfairly damaging, but he might like to call attention to that possibility. The formal report should therefore reflect the doctor's true personal estimate and not contain extraneous impressions, which might be construed to give an inaccurate view of the case.

The value of the doctor's testimony in court rests largely on his general intelligence and honesty. On the witness stand he should establish a reputation for honesty by giving his real opinion on questions asked, whether that opinion seems primarily to favor the company's interest or not.

Doctors who will not make an admission which might be detrimental to their side do not render as valuable services to their company as those who give honest answers, whatever they may be. But in giving these answers the doctor's general intelligence must come into play. He should not allow himself to be led into a discussion of subjects not relative to the case. When asked his opinion on irrelevant matters or on subjects with which he is not familiar, he should not hesitate to say "I don't know." He should remember that he is not expected to know everything, even in his own profession.

The more the doctor tries to express opinions on subjects on which he is not well posted, the more trouble he will have. The real issue may be so befogged that the value of his testimony on subjects he did know about will be lessened or lost.

Should the Company Doctor Attend the Claimant?*

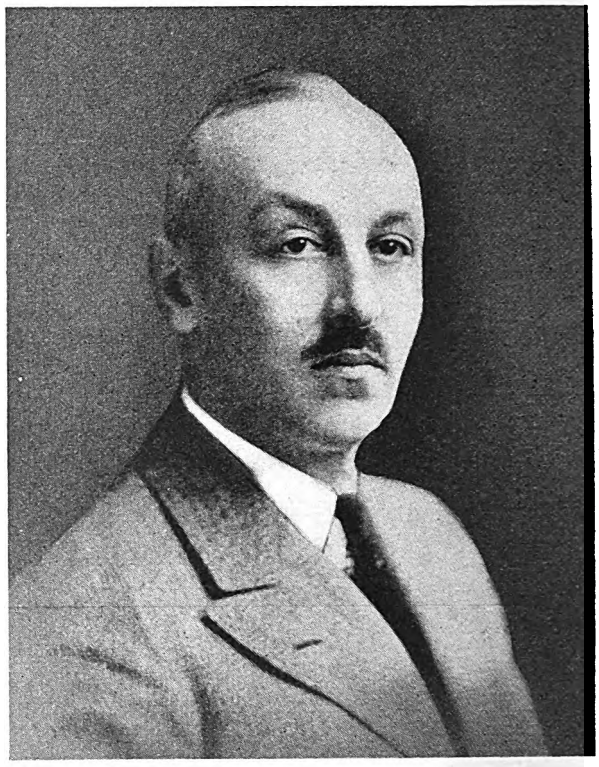
By Dr. Ernest W. Miller
Milwaukee Electric Railway & Light Company

SHOULD the company doctor attend the claimant? Emphatically, no. The company doctor, as such, has no place in the medical world. The term "company doctor" or "company physician" has long enough suffered the stigma of criticism and has long enough carried with it some unfavorable application.

But the surgeon of the industry has a worthy profession and a dignified one and he should attend the claimant.

For many years past and on every occasion possible I have attempted to elevate the plane of the surgeon of industry above that to which the old title has carried it. It is only by constant endeavor along these lines that we shall be able in the future to bring to this field the acknowledgment it deserves.

Last year, in this section, a paper was presented offering many points in favor of non-attendance upon the claimant. Such a policy may be entirely applicable in a community with which the writer was familiar. The problems of the various railways are local, and it is quite impossible to apply any fixed plan to all operating properties. My opinion is based upon my experiences of attending the injured as a surgeon of the industries for the past sixteen years.



Dr. E. W. Miller

The policy of the organization involved may be to treat: (1) Cases of liability only; (2) cases of all injured patrons; (3) cases of liability plus some protection settlements. After experience with each I believe the most desirable is the one we follow—namely, the first, or treatment of claimants where definite liability exists.

To do so satisfactorily, a thoroughly organized medical staff and staff of competent first-aid men are essential. This means also one or more men qualified to do all kinds of major surgery, traumatic and general. There must also be a close co-operation between the medical and claims departments.

In the event of injury, major or minor, the patient is assured not only of first aid but of complete treatment of the highest character. This certainly is to his material advantage. The advantage to the company cannot be overestimated. The contact of a competent, respected surgeon of a community alleviates many of the conditions which naturally arise between the individual claimant and the adjuster. Disability, if any, is reduced to the minimum, and the returns to the company are definite.

The surgeon of the industries should be equipped to the last word in his profession. He must put forth his best efforts, as any successful professional man must do. My experience forces the conclusion that it is possible for an organized medical service to treat practically all of the injured patrons where liability exists.

The patient who is imbued with the idea that he or she is receiving the best possible medical attention must have confidence in the physician, which leads to successful treatment of the patient. With recovery, both mental and physical, a sane approach is laid for adjustment.

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Uniform Traffic Regulation*

By Russell A. Sears
General Claims Attorney, Boston Elevated Railway

Its advantages are set forth, together with the applicability of the Hoover Conference recommendations

R. A. Sears

CONFERENCES concerning motor vehicle operation held at Washington, the first in 1925, the second in 1926, popularly and appropriately known as the Hoover Conferences, may be considered as important epochs in the history of the development of the nation.

In no national conference since the Constitutional convention was there displayed a greater, more wholesouled and unselfish intention to prevent or reduce the great loss than was shown by the delegates in those conferences. Every state in the Union was represented, and the personnel of the conferences was a cross-section of the citizenship of the country. More than a dozen committees composed of eminent and able men had met preceding the two convention meetings and prepared the way for action without loss of time. After a full and free discussion the work of the convention was embodied in the "uniform vehicle code," with which you are more or less familiar.

That the electric street car is a very important factor in the safe regulation of traffic needs no comment. In all probability the accident cost to the street railways of the country growing out of motor vehicle operation is not far from $20,000,000 annually, to say nothing of the cost resulting from collisions with persons on foot who use the highways, without mentioning the loss of lives and limbs to individuals. Hence as an economical problem alone, anything or any means that will reduce these losses is worthy of consideration.

There isn't a recommendation made by the Washington conference or in the uniform vehicle code to which the street railways can object concerning rules for the safe operation of vehicles. Hence we should interest ourselves in the observance and practice of those recommendations, and we have a further reason for our interest in the recommendations in that many of the railways are at present operating motor-driven buses. A study of the conference reports will also prove of help. Without going into the relative importance of street cars and motor vehicles in the transportation of the public, this much we are sure of: Both street cars and automobiles are here to stay, at least for the present, and any advice as to the operation of both should be welcomed by us.

Each delegate attending the conference should carry to his own state its message and advice. As the subjects dealt with in the conferences are of the highest importance to street railways, should we not ally ourselves with those carrying on this work? This would seem to be simply intelligent self-interest. As many other conferences are being held, at least in the eastern part of the country, of automobilists to promote safety on the highways active association with such bodies would seem to be appropriate for a street railway man so that the association may have the benefit of his experience and he share theirs.

If there is no body corresponding to an automobile safety association near by, then it is desirable to sit in with any neighboring safety association. Whatever be its function, the subject of automobile accidents is always pertinent and the reports of the Hoover conference constitute the best chart in existence from which one can always find his position and the direction in which to proceed.

At least we in Massachusetts think so, and we try to think and do in practical terms. As this is written the Governor of Massachusetts, prompted by the recommendation of the Hoover conferences and the two state conferences called by him, has offered valuable trophies to the three cities and towns having the best record concerning highway accidents for the six months beginning June 1, 1927.

What does this mean—an offer to award distinction on the residents of the city or town excelling in care on the highway? Isn't it apparent that care of persons in the streets and highways has a tendency to reduce highway accidents—and who would profit more as a class than the street railways? Finally, may I recommend this? Send to the Secretary of Commerce for a complete set of the committee and conference reports and recommendations concerning highway accidents, read them carefully and then deny, if you can, that you are more informed than before and hence better equipped to carry on your own work.

**Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Act. 3 to 7, 1927.*

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American Committees Continue Research

Important changes in constitution the feature of reports this year. Other reports on motor vehicle information, education, insurance, rapid transit and taxation presented

CHIEF among the reports of committees of the American Association this year is the one on revision of the constitution and by-laws, which was adopted in its entirety at the convention of the association held this week. The changes provide for the admission of independent bus operators under certain restrictions, revision of the financial structure of the Advisory Council and a change in the dues.

Continuing the custom of the past two years, these reports were not read at the convention, and this year for the first time, except for the constitution changes, they were not made the subject of special mention. Abstracts of the reports follow.

Rapid Transit

IT WAS the opinion of the committee on rapid transit that the most important problem this year was to present an authoritative analysis, from the viewpoint of an economist with adequate training, experience and standing, as to the proper allocation of the burden of cost in building rapid transit.

For some years the committee has been collecting all the available data on this subject, but felt the need of obtaining a study from a purely economic point of view. For this task it obtained the services of Leslie Vickers, economist of the association. He was given an entirely free hand in the preparation of a review of the economics of rapid transit which accompanies the report.

Mr. Vickers' study does not present exact formulas or specific detailed plans applicable generally, but advances principles on which the procedure in each city should be based. In his treatment he considers rapid transit as a special phase of general urban transportation by common carriers. The rights of the latter have been recognized in our commercial and industrial scheme for many generations.

Mr. Vickers says that the need for rapid transit has grown with the economic development of our cities into residence and business districts widely separated, which in turn is caused by the high degree of specialization reached within industry and commerce. The study points out that although few cities have any rapid transit facilities today, many are calling for them on account of street congestion. New surface routes are possible only in the smaller cities, where land values are low. In the larger cities new street facilities must be either elevated roads or subways.

New thoroughfares confer benefits on four distinct groups, according to Mr. Vickers. These are (*a*) the city as a whole; (*b*) the property owner; (*c*) the car rider, and (*d*) the automobile owner. He concludes that new thoroughfares should be paid for by all who benefit by them and not only by the group that uses them.

The study further points out that the city's share of construction and equipment can be met by taxation, the property owners by assessment, the car riders by taxation and the automobile owners by license fees and special taxation, without inflicting hardship on any one group.

No rule is laid down applicable universally as to the proportions of these payments or the means of collecting them. In each city where rapid transit is proposed, a local survey, free from the influence of politics, is recommended.

G. A. Richardson

In an appendix to the report the committee presented extracts from reports and documents relating to the consideration of plans for financing rapid transit in Philadelphia and Boston, together with some extracts of suggested procedure on the physical development of rapid transit in Boston.

Combined with the reviews and extracts of opinions included in previous reports of this committee, the 1927 rapid transit report concluded the survey which the committee has conducted for several years and which has resulted in bringing together an exhaustive analysis of the fundamentals of rapid transit as reflected by men of various schools of opinion interested in the subject.

The report was signed by H. L. Andrews, W. B. Bennett, Edward Dana, J. S. Doyle, S. E. Emmons, H. E. Ehlers, B. J. Fallon, Thomas Fitzgerald, R. F. Kelker, Jr., E. J. McIlraith, W. S. Menden, D. W. Pontius, F. H. Shepard, C. E. Smith, J. B. Stewart, Jr., D. L. Turner, James Walker, J. H. Alexander and G. A. Richardson, chairman.

Revision of Constitution and Bylaws

CHANGES proposed in the constitution of the American Electric Railway Association, as outlined by the committee, were made necessary mainly for the following purposes: (1) To broaden the statement of the objects of the association to accord more nearly with actual practice; (2) to make it possible for the executive committee to admit, with proper restrictions, companies operating any form of urban or interurban transportation systems; (3) to correlate more effectively the relation between the national association and the geographical railway associations throughout the country; (4) to provide for "plural voting" when demanded; (5) to consolidate the finances of the advisory council with the finances of the main association; (6) to revise the schedule of dues to the association.

In the discussion of the reasons for these proposed changes the committee pointed out that the actual work of the association involves discussion of all forms of urban and interurban transportation—not only electric railway but every other form, including buses. It was felt desirable that the statement of objects should be indicative of the broad function of the electric rail industry, which is to provide transportation in the community by whatever agency is best fitted to the particular task at hand.

Regarding the second reason for the changes, the committee explained that some of the present members of the association in smaller communities represent companies which have abandoned rail operation and have turned to buses but which have continued membership under the old constitution. There are, the committee pointed out, similar companies which have not gone through the rail stage and which under the old con-

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stitution cannot join the association. There are also dependable bus companies operating in conformity with the association standards but not technically coming under the definition of subsidiary or affiliated companies of rail organizations, which the association might desire to admit as members. In the proposed constitution effective safeguards have been thrown around the election of such companies so that the membership may be protected against the admission of companies the interests and practices of which might be inimical to those of the association or of any of its members.

Since the American association does not have geographical sections, it was considered desirable to provide a class of membership for the existing sectional railway organizations, as such, in order

C. D. Emmons

to tie together the work of all the various organizations in the industry.

The reasons for the provision of "plural voting" are, first, to make it possible to give proportional voting weight, on such matters as the adoption of engineering standards, to those companies whose purchases represent a large part of the equipment manufactured for the industry. In other words, a company that buys several thousands of a certain piece of equipment per year should have more to say, according to the committee, about the standards adopted to that equipment than a company that buys only fifteen or twenty pieces a year. The second reason advanced for the provision for "plural voting" was that under the amended constitution permitting admission by the executive committee of bus companies, "plural voting" would provide a check against the possibility of a large number of such small companies becoming a deciding factor in determining the policy of the association. Accordingly, it was provided in the new draft of the constitution that in case a member demands it, plural voting may be invoked and companies will have one or more votes depending on the dues paid.

The last two objects listed by the committee—namely, the consolidation of the finances of the advisory council with the finances of the main association, and the revision of the schedule of dues—are very closely related. Since the organization of the advisory council, its expenses were supported by contributions from member companies separate from dues. This made double machinery for the collection of funds from the industry in supporting what is essentially one activity and it was felt by all those concerned with the matter that it would be much more equitable in the long run to readjust the schedule of dues so that the financial side of all American Electric Railway Association activities would be consolidated. Careful studies were made by a subcommittee thoroughly representative of the various classes of membership, and the schedule of dues was arrived at as a more equitable method than the old system of dealing with the various classes of members.

The report was signed by J. G. Barry, H. V. Bozell, H. L. Brown, H. C. Clark, F. W. Doolittle, J. E. Hutcheson, M. B. Lambert, E. B. Meissner, L. H. Palmer, Harry Reid, G. A. Richardson, Paul Shoup, R. P. Stevens, J. H. McGraw and C. D. Emmons, chairman.

Insurance

COLLECTION of a two-year history of insurance experience was continued. The number of companies reporting this year was 35 more than a year ago, with $68,000,000 more insurance and $145,000 more premium. Tables which accompany the report show for the 279 companies allocating insurance to types of property covered, insurance carried, premiums paid, rate, losses and amount recovered, also the same data for 60 companies which do not allocate their premiums to the types of insurance carried. The committee also points out that the loss ratio is declining.

At President Sawyer's request the committee appointed a subcommittee to give the subject of fire prevention special attention. The conclusions in brief follow:

Too much emphasis can hardly be laid on fire prevention for street railways. It often appears that where several methods of reducing a particular fire hazard possess equal merit, one is accepted by the insurance authorities as the best and if followed, a maximum insurance credit will be obtained. The Engineering Manual Section B-100-23 contains some very helpful suggestions and recommendations on this subject. The Crosby-Fiske-Forster Handbook of Fire Protection is a nationally recognized authority on all matters of this sort, as are the various pamphlets published by the National Fire Protection Association.

It is advisable to submit plans of all new construction to the local rating bureau, or your insurance broker if he is in a position to furnish insurance engineering service, before the work is started, to obtain their suggestions regarding details of construction and fire-extinguishing equipment. Where automatic sprinklers are to be provided, the plans should provide that the work be done so as to conform to the bureau requirements.

In the effort to cut down expense on new construction, it is easy to allow fire hazards to creep in when, if fire prevention were properly considered, the additional expense involved would save a great deal more than its annual carrying cost in lower insurance rates.

Safety and fire prevention go hand in hand, and safety committees should be encouraged to give suggestions which will help to improve the condition of the property. If this places too great a burden on the safety committee, the work may be given to a separate committee organized to follow fire prevention work alone. Such a committee should be drafted from different parts of the organization. The inspections by this committee should embrace all phases of fire protection, including housekeeping, storage of combustible

P. E. Wilson

material and extinguishing equipment. Inspection work will be greatly aided if the employees feel that the management is personally interested in the work. The reports of inspection should be followed closely to see that defects are corrected as soon as possible.

Excellent results have been secured by many member companies in engaging the services of firm whose specialty is fire prevention. This is applying in a larger way the advantage derived in forming fire prevention committees among our own staff and our own employees.

It is essential that all employees be carefully instructed as to what they should do in the event of fire. This includes giving the fire alarm, use of fire extinguishers, running out of hose, the removal of essential records and property, etc. From time to time fire drills should take place to be sure that each person not only understands what he is to do but knows exactly how to do it.

Good housekeeping is largely the result of a habit of mind. There is nothing that so influences a clean mind as a dirty workshop or a dirty street car. Therefore street railway managements should lay great emphasis on the subject of good housekeeping, the result of which will be not allowing waste to accumulate about the plant. Any infraction of fire prevention rules should be followed up as strenuously as infractions of rules for operation of cars, the handling of revenue and all of

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the other ramifications of our business.

The committee recommends that it be continued another year with authorization to negotiate with insurance rating authorities for a reduction in the rates applying to street-railway properties. Such negotiations, naturally, will require the closest co-operation of the membership. The data collected indicate such rate negotiations are warranted.

The association statistician, Mr. Murphy, has again been invaluable to the committee.

The report is signed by O. H. Bernd, Edward J. Blair, A. C. Blinn, Granville H. Bourne, C. E. Brown, W. C. Campbell, N. H. Daniels, Samuel W. Greenland, F. M. Hamilton, L. R. King, A. D. Knox, F. H. Miller, John H. Moran, A. B. Paterson, F. J. Petura, B. L. Tomes, Edward A. West, H. B. Potter, vice-chairman, and Paul E. Wilson, chairman.

Education

IN LAYING out its program for the past year the committee decided not to try to cover too much ground, but to confine attention prncipally to continuing the work of last year along lines that seemed most promising.

The advisability of conducting another demonstration conference was considered, but the committee concluded that the purpose of that demonstration had been accomplished as far as it could be by that means. This purpose was to arouse interest in the conference form of instruction and to stimulate the holding of such conferences on as many railway properties as possible.

Omitting numerous intervening details, the outcome of the committee's discussion and correspondence was a plan for a "Training Course for Foreign-Conference Leaders" to be held in connection with the Cleveland convention. The conferences will be conducted by A. J. Sarré, of the New Orleans Public Service, Inc., and Henry H. Norris, of the Boston Elevated Railway, with the assistance and co-operation of Frank Cushman, of the Federal Board for Vocational Education, Washington, D. C.

The invitations to enroll in the leader-training course went out early in July, to permit correspondence with the registrants during the summer. Last year five letters with enclosures were sent by the committee to the members of the foreman-conference group. The result was the building up of a spirit of solidarity which facilitated the starting of the discussion at Cleveland.

The committee and the men in charge of the training course for foremen-conference leaders wish to emphasize the preliminary nature of this series of conferences. In six sessions of four hours' duration it is impossible to furnish the equivalent of the longer courses available at other times and places for this purpose. The course can form only a part of the training desirable for conference leadership. It is hoped, however, that as far as possible the men selected may be those who have already made a start in this field. The course also should be followed by reading along the lines suggested by the instructors.

Another subject which appealed to the committee as urgent at this time is the instruction of car operators, particularly along lines of courtesy, skill in giving good service, interest in the job, etc. A questionnaire was sent out to ascertain the present practice in post-employment instruction. The returns indicate a substantial interest in such training, but show that there is a wide field here for study and improvement.

A representative of the committee

Edward Dana

attended the twelfth annual convention of the Engineering Extension Division, Pennsylvania State College. A foreman-conference demonstration was a feature of that convention.

In the course of its researches the committee learned of much educational and training activity that could not be covered statistically. It is impracticable to include accounts of all of this in the present report, but typical descriptions are appended to indicate the trends of the best present-day educational effort.

The committee has been greatly encouraged by the interest of the industry in its efforts. These appear to be producing results. The "educational director," or his equivalent is increasingly in evidence on electric railway and allied properties. The committee desired to make a definite contribution to this development this year and to avoid spreading its activities over too wide an area. Co-operation by the industry in the leader-training course will insure such a contribution.

Following the committee's established custom, a bibliography is appended to this report referring to some of the important recent articles in the field attempted to be covered by the committee. This makes no claim for exhaustiveness, and the committee will welcome additions which can be included in the revised report.

The report was signed by H. H. Adams, George B. Anderson, A. H. Armstrong, W. H. Boyce, W. H. Burke, John A. Dewhurst, M. B. Lambert, R. J. Lockwood, M. McCants, F. H. Miller, Henry H. Norris, Arthur J. Rowland, A. J. Sarré, T. H. Tutwiler, J. S. Hyatt, vice-chairman, and Edward Dana, chairman.

Motor Vehicle Information

QUESTIONNAIRES were sent out to determine the trend of motor bus operations as affecting the electric railway industry. The results of this questionnaire follow:

1. Will the electric railways in your section purchase and operate appreciably more buses in 1927 than in 1926?

As a broad generality the trend still appears to favor the operation of appreciably more buses by electric railways this year. From the number which reply in the negative, however, it seems more accurate to conclude that a substantial part of the electric railways have now reached the limit to which they intend to expand their bus operations, while a larger number, who perhaps have undertaken bus operations more recently, still contemplate substantial increases in that form of service.

2. Will these buses be used to supplant electric cars or to furnish additional transportation service?

A marked uniformity of opinion is expressed in the responses to this query. New buses to be operated this year will function largely as feeders, in crosstown service and generally supplementary to the existing railway service of the electric railways concerned. Only in small cities does there appear to be any intention of supplanting the street cars with buses.

3. Is the number of buses operated by other than electric railways increasing or decreasing?

Opinion is sharply divided on the trend of independent operations. One group reports increased independent operations, while nearly an equal number find the situation stationary or decreasing. Where increases are noted, they apply largely to interurban operations and not always in competition with electric railways.

4. Are the buses now being operated by the railways and by others making a fair return on the investment?

It is the concensus of opinion that bus operations are not yielding a fair return on the investment. Interurban bus service seems to be generally more remunerative than city bus operations.

5. What is the trend of bus design in your section—toward larger or smaller buses?

Apparently many operators have already standardized on bus sizes which in their opinion best fit the local traffic requirements. Our replies indicate that 21 to 29-passenger buses are the average in city service, with larger buses on interurban routes. Where any trend is noted, it is almost uniformly toward larger vehicles.

6. Is the trend toward more luxurious buses or toward more passengers per 1,000 lb.?

A broad uniformity of opinion allows of two definite conclusions:

First, that interurban bus design tends toward more luxurious equipment, while with city buses the trend is toward lighter cars of plainer but more comfortable design; and

Second, that the trend is decidedly

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toward better buses—i. e., buses of structural stability, with six-cylinder motors and durable finish; buses designed with special consideration to reasonable life and low maintenance cost.

7. What is the trend of the schedule speed of buses—faster or slower?

In the southern sections the responses largely reflect a trend toward faster schedule speeds. While this appears to express the general purpose, many report slower schedule speeds resulting from traffic congestion.

8. Is there any change in liability insurance premiums, either higher or lower?

Several reported the appropriation of additional funds to injuries and damages reserve for the purpose of carrying their own insurance. The majority reported no change in liability rates and none reported lower rates.

9. What is the rate of fare tendency?

In no case is there any downward tendency in the rate of fare; the majority, regardless of their desires, anticipate no change, but several indicate an upward tendency.

10. When buses operated by independent operators are obsolete or otherwise unfit for use, is the tendency in these cases to abandon the lines or buy new buses?

With approximate uniformity the responses reflect tenacity in the independent operators and an ability, with the aid of time payments, to replace their equipment.

11. Are the bus manufacturers soliciting business in competition with electric railway operated lines? If so, who?

A substantial majority exonerate the bus manufacturers from the implication of undue efforts to establish independent competitive operations.

12. What is the tendency toward freight haulage by trucks in your territory?

While some replies indicate a comparatively small increase in freight haulage by trucks, nearly all agree that an increase, either large or small, is taking place; and none report a decrease.

13. To what extent have unregulated interstate bus lines been established and what is the tendency toward an increase or decrease in this kind of operation?

Some observers located centrally in their respective states note little if any interstate bus operations, but the majority report a small to large interstate bus business—mostly increasing.

14. What other indications do you see in your territory that have bearing on the tendency of future bus operations?

So far as such a leading question might be expected to result in any uniformity of reply, it may be said that several look for increased bus operations. Among the comments we find the expectation that bus operation in the future will tend to become concentrated largely under the management of the electric railways and the anticipation that the continued increase in the use of the private automobile will have the greatest bearing upon future bus operations.

15. What, in your opinion, should the executive committee of the association be giving particular attention to in regard to the bus situation?

In the field of legislation four companies direct the attention of the executive committee to the need for state or interstate bus regulation in their respective territories. Others suggest that the executive committee should investigate and give wide publicity to (1) the relative function of the railway and bus, and effect of bus competition upon electric railway operations; (2) the relative cost of bus and electric railway operations when equally burdened in respect to service regulations, taxes and liability for injuries and damages; and (3) the unseen cost of bus operation which the public pays through the various forms of taxation that provide for the upkeep of the highways.

Among the replies we find the promulgation and prompt adoption of a uniform system of bus accounting very strongly urged, while efforts toward standardization of bus design and elimination of high-pressure sales policy of bus manufacturers toward prospective bus operators are suggested.

The report was signed by Joseph H. Alexander, Carl H. Beck, M. R. Boylan, Luke C. Bradley, F. G. Buffe, H. B. Flowers, M. B. Lambert, D. W. Pontius, Harry Reid, R. B. Stearns, W. B. Tuttle, E. P. Waller, S. B. Way, vice-chairman, and R. P. Stevens, chairman.

Taxation

CONSIDERATION during the past year has been given to the problem of the complicated and discriminatory tax systems which now prevail in most states against street railways. In many states street railways are carrying a greater tax burden than is now carried by other public utilities or by mercantile and manufacturing corporations. This fact was very clearly established for New York State by the survey made a few years ago by the special joint legislative committee on taxation and retrenchment, of which Senator Frederick M. Davenport was chairman.

A survey conducted by the advisory council of this association in 1925 and 1926 showed that street railway companies in the various states were faced with inequitable tax burdens similar to those existing in the State of New York.

It is self-evident that when any industry is compelled to pay more than two-thirds of its net revenue in taxes, relief of some sort should be furnished.

We are calling attention to the above inequalities of taxation, not for the purpose of establishing that any other public utility is not paying a large enough share of the tax burden, but merely for the purpose of showing that any system of taxation which produces such inequality must be wrong in principle.

The report of the New York committee referred to, recommends the adoption of a tax on public utilities based on the elements of both gross and net income and said that such a tax would possess the advantages of certainty, simplicity and equity. Your committee on taxation has devoted its entire attention during this year to the question of whether it should recommend to this association the adoption of the principle of a gross net tax on street railways in lieu of all other forms of state and local taxation, such gross net tax to be apportioned by the state authorities among the various municipalities or governmental agencies of the state.

It is realized that the street railway industry is now faced with a tax system which has grown up historically by piecemeal legislation applied at different times to different classes of corporations, with the result that such tax system has the defects of uncertainty, arbitrariness and complexity. It is further realized that the street railway industry is now paying an unjust and discriminatory portion of the tax burden of the various states and that some simple and equitable form of taxation should be substituted in place of the present complicated and discriminatory tax systems which now prevail in most of the states.

The gross net tax, such as suggested by the New York legislative committee, would impose a minimum tax on the gross revenue from operation of street railways, even though its net revenue from operation was small or nonexistent, and the rate of tax would increase in the case of such street railways as had a net operating revenue, such rate of tax being increased in the proportion that the net operating revenue bore to the gross operating revenue. The gross net tax, therefore, has, first, the element of simplicity; second, the element of equity, in that the rate of tax is graduated according to the ability of a particular street railway to pay such tax, and, third, the element of insuring a permanent stable revenue in that it provides for the imposition of a minimum tax on gross revenues from operation irrespective of whether or not a street railway has a net operating revenue. At a meeting of the committee on Dec. 10, 1926, a vote was taken by the members upon whether it should recommend this form of tax to the association. The vote was 9 in favor and 1 opposed.

The members felt that in view of the importance of the subject and that a full membership of the committee was not present, a subcommittee should be appointed, with the chairman of the committee on taxation as chairman, to prepare a report to be submitted to all the members of the committee for their action by letter, vote or otherwise. This report has not yet been completed, and the committee on taxation asks that it be continued for another year so that it may act upon the question to be submitted by the subcommittee.

The report was signed by Charles H. Allen, B. J. Denman, Robert M. Feustel, Albert W. Flor, Harold L. Geisse, James P. Griffin, Daniel J. Hennessy, William A. Jackson, H. A. Mitchell, L. R. Nash, D. J. Strouse, C. L. S. Tingley, A. C. Watt, Paul E. Wilson, Edward W. Wakelee, vice-chairman, and Alfred T. Davison, chairman.

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Latest Developments in Accounting Methods

Reports of committees of Accountants' Association summarize progress during the past year. Wide range of subjects covered illustrates scope of electric railway business

MUCH activity characterized the work of the committees of the Accountants' Association during the past year. The classification of bus accounts adopted at the 1925 and 1926 conventions was adopted by the National Association of Railroad and Utilities Commissioners last October. The report of the committee this year is one of progress. No requests for a revision have been received, nor has it been found necessary to issue a condensed classification.

Abstracts of this and the other reports presented follow.

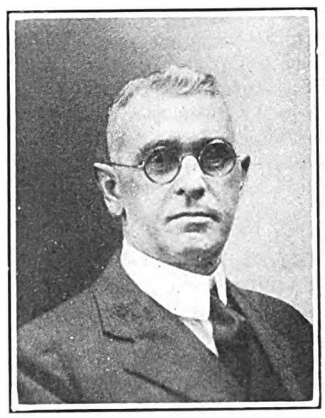
L. E. Lippitt

Retiring President Accountants' Association

Stores Accounting

THE SUBJECT chosen for study and report was storage, distribution and accounting for gasoline, oils and grease used on buses and automotive equipment. Seventeen questions were sent out to 55 companies. Forty-one companies responded. Due to varying conditions the committee made no extended recommendations.

The answers showed that the amount of gasoline purchased a month ranged from 3,000 to 1,000,000 gal. and that the average for the 41 companies reporting was about 58,713. The total purchases of gasoline for the year of these 41 companies was about 28,900,000 gal., having a value perhaps in excess of $4,500,000. These figures show the desirability of following the best practices to eliminate waste and to insure statements of cost as correct as possible.



R. A. Weston

Twenty-five companies purchase gasoline in tank wagons, seven in tank cars, three in both tank wagons and tank cars, two in both tank wagon and from service stations, two from service stations and two companies did not report. In general the capacity of the storage tank is for a few days only.

For measuring the gasoline delivered, seven companies use tank wagon measurements, two companies use standard-size cans and two companies use gage tank cars. The remainder measure shortage in the tank. In general, the method followed in checking the quantity of gasoline delivered is by means of wooden calibrated sticks. One company that receives by tank car gages the car and figures for temperature correction.

In receipting for gasoline, some companies use special receiving forms and others use regular receiving receipts. The receiving record is checked against the invoice generally. Only two companies carry large enough supply so that advantage can be taken of trend of market. Most companies have small-capacity tanks.

Inventories are taken at various times as follows: yearly by one company, semi-yearly by one, monthly by fourteen, daily by five and at various times by eleven. No inventory is taken by two companies and no report was received from seven.

No companies reported any great amount of trouble from the accumulation of water in their tanks.

On the question of loss through evaporation, wastage or other causes one company reported an estimated loss of from 1½ to 2 per cent and one company 1.75 per cent. The rest estimated less than 1 per cent or had no available data.

Sixteen companies gas their buses from storage points, nineteen from storage points and public stations, one from wagons and public stations, one from storage and wagons, two from public stations and two companies made no report.

In accounting for the gassing and oiling of buses twelve companies use material and supplies requisition and eighteen companies use special gas and oil requisition.

Gasoline is purchased under a yearly contract by 23 companies, under a monthly contract by one and under various other kinds of contracts by six. Nine companies have no contract and two companies made no report.

Twenty-seven companies maintain a special ledger account for gasoline, thirteen do not; one did not report.

Twenty-nine companies carry oils in their stores account, seven companies charge this material direct to the proper account and five companies did not report. With grease, twenty companies carry it in stores account, twelve companies charge it direct and nine companies did not report.

Among the companies reporting on forms used in gasoline and oil accounting, the one that has gone most extensively into the operation of buses and whose consumption of gasoline is approximately 1,000,000 gal. a month, reported its methods in considerable detail. Briefly, they are as follows:

Blanket requisitions on the purchasing agent are prepared by the stores department. One requisition is made for gasoline covering delivery at all points. A separate requisition is made for each kind and grade of oil and grease. These requisitions also specify that the mate-

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rials are to be delivered as required and that when the vendor makes deliveries, the company's order number must be indicated on the delivery slip left at the delivery points by the drivers of tank wagons. Purchase orders to conform to the wording on the requisitions are issued by the purchasing department.

As gasoline, grease and oil are required at each point the vendor is notified, but at points where there is a large consumption this is not necessary, as the vendor becomes familiar with the requirements and makes deliveries at regular intervals. When each delivery is made, the clerk or foreman measures the contents of the tank; then he sees that the tank wagon compartments are full before being emptied and that these compartments are empty when delivery is made and again measures the tank after delivery. A receiving report is made on a special receiving card, showing the date, by whom delivered, what is delivered and the quantity, the vendor's delivery ticket and tank wagon numbers, the order number, and stating that the tank wagon compartments have been observed before and after delivery. If the tank wagon contents are taken out by can, a statement to that effect is made in the place provided. The vendor's delivery ticket is attached to the original or paper copy in the receiving card book and the cardboard copy is torn out and forwarded at once to the stores department general office.

The vendor renders bills for each delivery made at each point. They are checked, then classified to the proper account. The receiving card number is entered thereon, certified as to correctness, listed on a bill statement and forwarded to the purchasing department, where they are again checked as to price and entered against the proper orders. Bills are then forwarded to the auditing department for recording and payment.

As gasoline or oil is put into buses or otherwise used, a daily memorandum is kept on the quantity, this being determined by measuring apparatus on the pump and tanks, or, in the case of oil, by cans. The data on these daily memorandums are transferred daily at each using point to a monthly gasoline and oil report. The consumption is totaled by bus numbers several times a month so that the total consumption per bus may be noted periodically at short intervals. At the end of each day the consumption, receipts and quantities on hand (by stick measurements) are checked up and entered at the bottom of the form and the "over" or "short" shown as the case may be. These overs and shorts are carried through to the end of the month, where a net "over" or "short" is arrived at. Then the original of this report is forwarded to the stores department, where it is checked against the record of receipts (from receiving cards) and invoices. It is then forwarded to the auditing department for further checking. The net "over" or "short" for the month is then apportioned against each bus number shown on the report in proportion to the consumption of each bus to the total consumption, for the purpose of keeping a consumption record by bus numbers.

A special supplementary report is made monthly by the stores department to the auditing department of any deliveries made in the month for which bills have not been received, in order that charge entries may be taken up in that month for deliveries not billed.

On a large system it is advisable to have one man take complete charge of gasoline and oil matters, for maintaining relations with the vendors as to details and for the general system of operation as regards fuel and lubricants.

The report was signed by W. V. Shoemaker, W. S. Stackpole, F. E. Wilkin, and R. A. Weston, chairman.

Standard Classifications

DURING the past year the committee received a notice from the Interstate Commerce Commission of a hearing on depreciation for electric railways to be held Feb. 28, 1927, at Washington. This hearing was subsequently postponed to May 23, 1927, and later indefinitely postponed. In view of the

M. W. Glover

fact that when this subject came up for discussion several years ago in connection with a similar hearing before the Interstate Commerce Commission relating to steam railroads, a special committee was assigned to handle the subject by the American Electric Railway Association, the committee felt it would be inadvisable to take any official action in connection with the proposed hearing, even though it appeared to cover an accounting matter, which would presumably be handled by the Accountants' Association. Nothing has therefore been done on this subject other than to keep in touch with developments.

The subject of accounting questions appearing in the question box of *Aera* was brought to the attention of the committee and arrangements were made with the editor of *Aera* that all accounting questions involving an interpretation of the classification of accounts would be sent to the committee before publication, in order that an official answer could be secured when necessary from the Interstate Commerce Commission, in accordance with the arrangement in effect between the bureau of accounts of the Interstate Commerce Commission and the committee, whereby all inquiries relating to the classification of accounts for electric railways are submitted to the committee before a ruling is issued by the commission.

All accounting questions which do not require an interpretation of the classification will, of course, be published in *Aera* without reference to the committee. The only questions submitted to the committee will be where an interpretation of the classification is involved.

During the year several inquiries were received from electric railways operating in the United States and in Canada. These were submitted to the bureau of accounts of the Interstate Commerce Commission and answers approved by the committee and by the commission were given. [These questions and answers will be published in a later issue of ELECTRIC RAILWAY JOURNAL. —ED.]

The report was signed by H. L. Wilson, I. A. May, P. S. Young, C. S. Mitchell and M. W. Glover, chairman.

Bus Accounting

THE most important development during the past year was the adoption by the National Association of Railroad and Utilities Commissioners at their convention in Asheville, N. C., in October, 1926, of the bus classification of accounts, approved by the Accountants' Association at the conventions in October, 1925, and October, 1926.

This therefore makes the bus classification the standard classification of accounts for motor bus transportation companies and in future this classification will be referred to as the "Standard Bus Classification."

During the past two years the standard classification has been used by a number of companies operating in the states of Connecticut, New York, New Jersey, Pennsylvania, Maryland, West Virginia, Virginia, Ohio, Indiana, Illinois and Wisconsin, and is in use by companies operating in the District of Columbia. The classification is probably used in other states by companies which have not adopted a classification of bus accounts, but the committee has not been able to secure the names of the companies and the other states in which the classification is now in use. Its adoption by the National Association of Railroad and Utilities Commissioners, the membership of which comprises the public service commissions of all states as well as the Interstate Commerce Commission, should result in an increased use of the classification and will promote uniformity in bus accounting throughout the United States, which is very desirable.

During the year the committee has received several questions relating to interpretations of the classification, and in accordance with the authority given at the October, 1926, convention, answers to these questions have been given by the committee. [They will appear in a later issue of this paper.—ED.]

The General Office Equipment Cor-

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poration of New York has issued a pamphlet entitled "Standard Accounting System for Bus Operating Companies," using the standard classification as a basis of the system suggested, and copies of the pamphlet have been furnished for distribution to the members attending this convention.

The chief of the bureau of accounts and statistics of the Pennsylvania Public Service Commission invited the committee to attend a hearing in Harrisburg, Pa., Aug. 17, 1927, to review a proposed tentative classification of accounts for passenger motor transportation companies which has been under consideration by the Pennsylvania commission. A meeting of the committee was held in Harrisburg on Aug. 16 and the tentative classification was considered and compared with the standard classification. The result of the examination of the two classifications showed several small differences. The committee attended the hearing on Aug. 17 and offered verbal suggestions relative to changes in the proposed Pennsylvania classification to bring it in line with the standard classification. The chief of the bureau of accounts and statistics at the close of the hearing invited the committee to submit suggestions in writing and stated that they would be carefully considered before the classification was issued by the Public Service Commission. In response to this invitation the committee submitted a statement under date of Sept. 1, 1927.

It is needless to advance reasons showing the desirability of uniform accounting throughout the United States, and it is hoped that the Pennsylvania Public Service Commission, as well as the commissions of other states, will carefully consider this subject before issuing a classification different from the standard classification, which has been approved by the National Association of Railroad and Utilities Commissioners. The most serious objection to the adoption of different classifications in the various states is the fact that a number of bus companies operate between states, handling interstate passengers, and it would be manifestly impossible for such companies to keep their accounts under two different classifications if the states in which they operated should issue different classifications.

So far no requests have been received for a more condensed classification than that adopted at the 1926 convention, but if smaller companies feel that a more simple classification is needed, it can be readily prepared from the two classifications now in use, the complete classification being prepared for companies with annual operating revenues in excess of $100,000 and the condensed classification for companies that have operating revenues of less than $100,000.

The report was signed by P. R. Jacques, H. C. Kimball, C. R. Mahan, C. W. Stocks, N. E. Stubbs, E. A. Tuson, and M. W. Glover, chairman.

Representation at Convention of National Association of Railroad and Utilities Commissioners

THE chairman of the committee attended the 1926-27 convention of the commissioners, and while he took no part in the discussions he was present at practically all the sessions and discussed matters of interest with members and other guests of the association.

W. L. Davis

Probably the item of most importance to this association was the action taken by the committee on statistics and accounts of public utility companies. This committee, in its report, covered the following subjects: (1) Standard classification of accounts for motor vehicle operations, (2) pending (or possible) revision of the standard classification of accounts for electric railways by the Interstate Commerce Commission, (3) destruction of records of public utilities. The present status of each is:

1. The committee's report recommended for adoption two classifications, one covering operations with gross revenue of more than $100,000 per year and the other for operations with gross earnings under that amount. The report states that the uniform system of accounts, made a part of the report, has been adopted by the American Electric Railway Association. In making its recommendations, however, the report was submitted "with the proviso that in so adopting these systems of accounts each state commission or regulatory body having jurisdiction in such matters will have the right to amend or modify such system of accounts on order to meet their own special requirements or needs."

2. The chairman of the committee recommended that the committee appointed to take care of this work during the coming year co-operate with the Interstate Commerce Commission in any changes or revisions in the present classification of accounts for electric railways. The chairman also advised, in this same connection, that Chairman Eastman of the Interstate Commerce Commission had been consulted and had approved the recommendation.

3. Recommendations were made that the subject of destruction of records be assigned to the incoming committee, as the present committee had not sufficient time to consider it.

The report of the committee on statistics and accounts of public utility companies was accepted by the convention, hence it will be very essential for this association to follow up the work outlined in sections 2 and 3 above. Possible changes in the situation in connection with a uniform regulatory law (now under consideration) and possible revisions of the electric railway classification may have an effect on the status of the bus classification and the application thereof.

The matter of accounting for renewals, replacements, retirements and depreciation on electric railways was discussed informally by several present at the convention, but it was not mentioned in the proceedings.

The time and place of the next convention was fixed for the third week in October at Dallas, Texas.

The report was signed by W. L. Davis, chairman.

*BUS operation is playing a very important part in the transportation field. * * * It behooves every member of our association to put forth every effort to have our standard classification of accounts for bus operation adopted by all state commissions and used by the bus operators, rather than some time later to find ourselves confronted with a classification put out by the several state commissions. It is highly important that a national standard be adopted.*

—*From* PRESIDENT LIPPITT'S *address to the Accountants' Association.*

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Definite Recommendations Made by Engineering Committees

Work done during the past year by way and structures and equipment divisions has progressed favorably under new group organization. Additional reports presented on heavy electric traction and power subjects

THIS year the committees studying equipment subjects were grouped under the same general plan as that adopted by the way and structures group a year ago. The reports presented show clearly the beneficial results of this procedure. Committees studying the subjects of heavy electric traction and power generation and distribution continue to work independently. Abstracts of the reports follow.

Daniel Durie
Retiring President Engineering Association

Power Transmission and Distribution

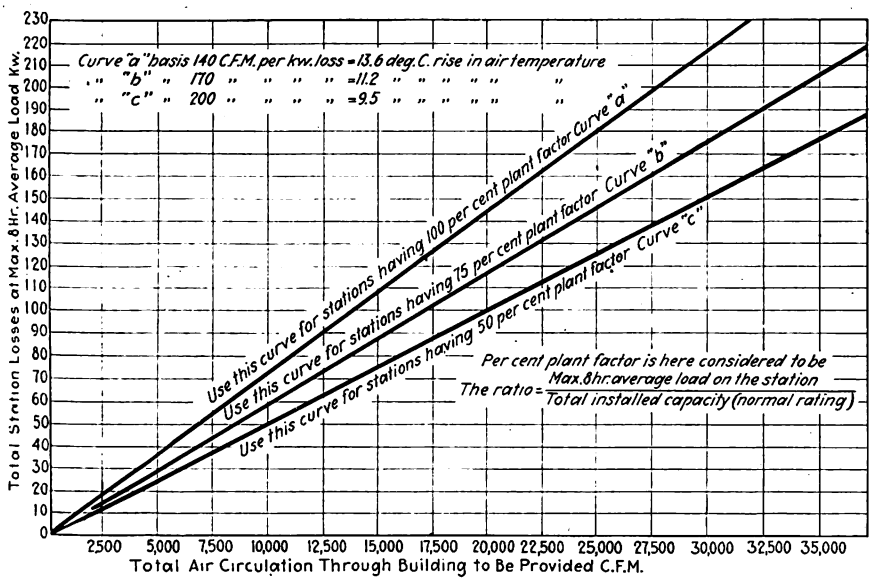
IN REVIEWING existing manual sections the committee agreed upon data to be added to the section covering insulators for contact bar supports and submitted a drawing.

The committee submitted specifications covering materials for catenary construction. These are designed to be included eventually in a comprehensive specification for overhead line material, for both direct and catenary suspension, which will include the material appearing at present in the manual.

The committee reviewed the specifications for catenary overhead construction for other than steam railroad electrification for the purpose of preparing any necessary revisions. It found that a number of changes are desirable and presented a list of them as information only. The committee felt that there is still much work to be done on this specification and did not recommend the adoption of these revisions at this time.

The committee continued the study of trolley wire breaks and carried it forward in a manner uniform with that used in reports for 1925 and 1926, covering substantially the same properties.

The committee felt that the data available are still insufficient for a full comparison of results, and it is believed that next year, with four years of uniform data at hand, a more complete comparison can be made and reasonably safe conclusions stated. The committee called attention to the decreasing frequency of trolley breaks, due to both crystallization and wear, at points of support. Attention was also called again to the increasing percentage of breaks due to causes beyond the control of the line maintenance forces, such as burn-downs and pull-downs by cars, etc. This item shows a steady increase from 27.1 per cent in 1922 to 34.6 per cent in 1926.



Total air circulation required through building corresponding to total losses at average load for stations having 50, 75 and 100 per cent plant factor

At a joint meeting of the A.S.T.M. and the association, the specification for bronze trolley wire was discussed. It was shown from the experience of the past two years that the present tensile strength requirements represented selected material and could not be reached by all good and acceptable wire. It was also shown that the per cent elongation in 10 in. for the 133,225-circ.mil size was slightly out of proportion with the requirements for the other sizes. The manufacturers also pointed out that the present requirement (that grooved trolley wire should have 95 per cent of the tensile strength of round wire) was not supported by tests of the material, and there appeared to be no reason why the tensile strengths should not be the same for wire of the same nominal cross-sectional area. It was, however, also brought out that grooved wire would not normally have as great an elongation as round wire, with the result that a reduction in this requirement was agreed upon.

With regard to the twist test, it was shown that the present A.E.R.E.A. requirement was too severe for the larg-

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est sizes and that the A.S.T.M. requirement was not severe enough for the smaller sizes. It was agreed to state a minimum number of twists for each size of wire, at the same time keeping the test as a qualitative test to discover defects.

The changes were embodied in a revised specification which was submitted for approval.

A number of cases of radio interference were brought to the attention of the committee, but in each case the causes had been anticipated and described in the 1926 report. Remedies suggested in that report were applied in a few cases with gratifying results. No new additional sources of interference were brought to the attention of the committee since the last report was made and it is the opinion of the members of the committee that the 1926 report is comprehensive enough to identify nearly all cases of radio interfence caused by trolley car operation and to apply a remedial measure.

The committee gathered some data relating to the physical conditions and methods employed on various systems, with the idea of establishing a standard by which the various methods of operating and maintaining overhead lines may be compared. In making a preliminary digest of these, it was found that there is possibly a very fruitful field for investigation, the results of which, it is expected, will set up an arrangement by which an operating engineer may compare his methods of using labor and material and the results he obtains with the methods and results obtained on different operating roads, traffic density and such other factors of wear being taken into consideration.

The committee recommended that this subject be continued next year.

The committee has been in communication with various users of trolley wire reels and found that, with the existing divergence of opinions, no formal report could be made at the present time.

The report was signed by J. Walter Allen, S. H. Anderson, W. H. Bassett, James H. Drew, D. D. Ewing, C. E. Hancock, W. F. Healy, S. S. Hertz, Kirk J. Keith, A. J. Klatte, John Leisenring, H. S. Murphy, W. J. Quinn, M. B. Rosevear, W. Schaake, A. Schlesinger, Dwight L. Smith, R. E. Wade, George F. Wennagel, M. W. Cooke, vice-chairman, F. McVittie, chairman, J. F. Neild, secretary and Charles H. Jones, sponsor.

Power Generation and Conversion

SUMMATION of the investigation made regarding ventilation of automatic substations was given. This was arranged so that with a given machine and knowledge of the load to be carried, the quantity of air to be circulated and the size of inlet and outlet openings may be determined easily under various combinations of plant factor and ventilating head. A brief summary of the tests was given, together with a number of suggestions to substation designers in the determination of characteristics and arrangement of required ventilating equipment and result in generally improved temperature conditions in substations.

The plant factor on railway substations generally averages less than

F. McVittie

50 per cent. Sustained overloads of as much as two hours' duration occur frequently, however, but these are to some extent counterbalanced by the thermal storage capacity of building structure and equipment as well as of the machines themselves in so far as the required temporarily increased dissipation of losses is concerned. The resultant temperature in the usual railway station, after its customary two-hour overload period, is decidedly lower than that corresponding to a continuous load of the same magnitude because of this thermal storage capacity. It is estimated that the masonry work alone of an average two-unit substation will absorb 72 kw.-hr. per deg. C. rise in temperature. Obviously some advantage can be taken of these mitigating circumstances in the determination of the ventilating equipment which must be provided for dissipation of losses. One means to this end is to determine sizes of openings or fan capacities on the basis of air circulation per unit of loss during maximum eight-hour average load for stations of low plant factor and decreasing the air circulation per kilowatt loss as the plant factor increases in some such ratio as: 200 cu.ft. per minute per kilowatt loss for stations having 50 per cent plant factor, 170 cu.ft. per minute loss for stations having 75 per cent plant factor, 140 cu.ft. per minute per kilowatt loss for stations having 100 per cent plant factor, corresponding to temperature rises of the ventilating air of 9.5, 11.2 and 13.6 deg. C. respectively. Curves were worked up on this basis for total station losses at maximum eight-hour average load, as high as 220 kw. They may be extended indefinitely. The total air circulation to be provided through the building can be read on the lower scale directly below the intersection of the horizontal line corresponding to the eight-hour average losses and the curve corresponding to plant factor.

The free areas of inlet and outlet openings required to obtain the necessary amount of ventilation in naturally ventilated stations depends on the velocity which can be imparted to the flow of air, and this in turn depends largely on the arrangement of station equipment relative to the ventilating openings. Based on observations during test, it would seem that velocities equaling 50 per cent of the theoretical velocity due to chimney action alone can easily be obtained if machines are so arranged that their fan action aids the chimney action in the ejection of heated air from the building.

As the capacity of individual machines increases it becomes necessary to dissipate more heat per cubic foot of building space. For equal capacities, motor-generator sets require more ventilation than converters, due to their lower efficiencies. For relatively large units the outlets may become so large as to occupy the entire roof, resulting in expensive roof construction or costly ventilators or both. In some localities roof ventilators may present objectionable architectural features. In addition the high indoor temperature consistent with natural ventilation may become uncomfortable, particularly in warm climates. It then becomes necessary to collect the heated air as discharged from the machines conducting it outdoors. This can be effectively accomplished by means of collecting housings and ducts.

Forced Ventilation

There are conditions more or less special where forced ventilation is the proper solution as:

(*a*) When continuity of operation is highly important, it has been deemed advisable to install forced ventilation where stations are subjected to protracted durations of dead calm with high outdoor temperature.

(*b*) In noiseproof stations.

(*c*) Where air filters, washers, coolers or other known high resistances against air flow are introduced.

(*d*) In stations located in basements or underground where space is not available for ventilators of sufficient area for natural ventilation.

(*e*) In particular cases where capital charges and operating costs for forced ventilation are less than that for natural ventilation costs.

Since it is the recirculation of the heated air discharged from the machines that causes a high ambient temperature, it seems logical that the most effective method of ventilation is to collect this heated air and convey it outdoors. This procedure presents an easier problem than that of feeding cooling air at outdoor temperature to the machines. It lends itself more readily to an arrangement in which fans and machines combine their efforts to eject heated air. Fans of lower discharge pressure can thus be used, since the heated air, being confined, can be allowed higher temperature rise and the fan capacity be correspondingly reduced, resulting in minimum energy consumption of the motor.

Efficiency curves were given previ-

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ously for 600-volt and 1,500-volt 60-cycle mercury arc rectifiers in comparison with similar synchronous converters.

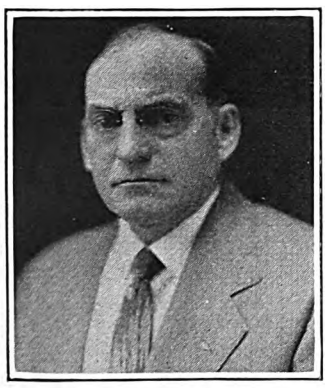
The inherent characteristics of the rectifier as at present designed are somewhat different from those of the synchronous converter or the motor-generator set. The committee recommended that the A.I.E.E. standard of rating for synchronous converters and motor-generator sets for railway service be applied to mercury arc rectifiers for railway service. It was the opinion of the committee that this method of rating will put the rectifier on the same basis as the rotating machines and will avoid confusion in the minds of operators when making comparative studies of converting machinery. It was recognized, however, that under the suggested standard of rating the rectifier of present design will have a continuous capacity greater than its nominal rating and also that it will be able to carry higher momentary loads than the converter with the same nominal rating.

Questionnaires were sent to 23 owning and operating companies in the United States and Canada, requesting data on characteristics of their rectifiers and experience thus far obtained in operation. Replies were obtained from practically all of these companies.

Automatic operation was reported as fairly satisfactory as far as the rectifier itself is concerned. Trouble has been experienced, however, with accessory equipment of various kinds.

The report was signed by C. E. Bennett, C. A. Butcher, H. W. Codding, A. M. Garrett, H. W. Kidder, Nelson R. Love. H. W. McRobie, Otto Naef, F. W. Peters, W. S. Richhart, G. W. Saathoff, L. J. Turley, R. L. Weber, R. G. Winans, G. I. Wright, W. E. Bryan, chairman; L. D. Bale, sponsor.

Wood Preservation



C. A. Smith

PREVIOUS committees have covered the subject of wood preservation so thoroughly that it remains only to keep specifications and recommendations up to date and in line with those of other organizations, such as the American Wood Preservers' Association and the American Railway Engineering Association.

Treating timber in place has been adopted by the two largest communicating companies as standard practice. As a result of the carefully compiled reports from these companies there is evident a rather widespread interest in securing the longest life possible from the pole timber now in line. While a considerable number of companies adopted such treatments during the past year, these are in no position to add to the information already presented in previous reports. Those interested are urged to obtain the reports which will be issued by a committee on service records of pole timber which was appointed by the American Wood Preservers' Association at its last annual meeting. No further report has been received on the Cobra treatments used abroad and especially in Germany and Austria.

Most of the users of the record form reproduced in last year's *Proceedings* do not keep any record of the treatment or installation, but keep simply a record of the number of ties or other materials installed each year as a starting point, and record is kept of the removal of such treated materials from year to year. When such removals take place, the date of installation is obtained from dating nails put into the material at the time of treatment. Such a practice is very satisfactory where a standard specification has been adopted so that all of the material is handled in the same manner before treatment and the treatment itself is standard.

The committee wished to impress on all users of treated timber the importance of keeping some record of the life obtained on all their particular materials, as it is only by such records that necessary changes in specifications can be intelligently adopted and the actual economy of treated materials can be definitely obtained.

The continued and growing interest in wood preservation as a part of the country's belief in timber conservation supports continued interest in new preservatives or methods. Information on two of the newer preservatives is reported this year. The first, wood preservation with insoluble inorganic salts, is a new development in the form of preservative salts said to remain in the wood without loss due to leaching or weathering influences. It was sought to discover preservative materials which would be as permanent as creosote, low in cost and available in large quantities. The second uses cold treater dust as a wood preservative. Cold treater dust is a smelter byproduct obtained from the Cottrell precipitators of smelting works. The material comes in the form of a finely divided powder. It is composed mainly of arsenic trioxide usually containing about 75 per cent of this substance mixed with compounds of lead, copper, zinc, bismuth, selenium and tellurium.

It was recommended that the committee on wood preservation as an independent committee be abolished, and that a special committee of the Way and Structures Division be appointed to handle the subject in the future. This special committee should contain representatives from the Power Division, as this group is vitally interested in creosoted poles and crossarms.

The report was signed by J. M. Curtin, T. H. David, J. L. Fritsch, W. H. Fulweiler, Ernest F. Hartman, W. L. Harwood, Leo P. Scanlan, F. H. Swayze, A. P. Way, R. H. White, and C. A. Smith, chairman.

Purchases and Stores

J. Fleming

NO CHANGES in the existing recommendations and miscellaneous methods and practices, as incorporated in the *Engineering Manual,* are recommended.

Owing to the apparent lack of interest in supporting a central exchange for the disposal of unused, inactive material, the large expense involved in its operation and the limited application of the surplus materials offered, the committee recommends against the establishment of such an exchange. Instead, the following procedure is suggested: (1) Endeavor to dispose of materials through company subsidiaries or allied companies, (2) seek permission of the manufacturer to return surplus materials to him for credit or obtain from him a list of other users who might be interested, (3) canvass nearby properties, (4) advertise individually in trade papers or seek an outlet through equipment or second-hand dealers, (5) scrap locally on the recommendation of a storekeeper or a committee duly authorized to act in such matters.

The committee outlined in its report a schedule of routine methods to be departments and suggested it be approved as a recommended method in the Manual Section.

The committee believes that a systematic plan for inspecting and testing materials should be adopted by all railways but that such testing and inspection of materials are primarily a problem for the engineering department of individual companies, and that department should decide what methods should be followed and the extent to which standard tests should be applied. It is believed, however, that the stores department is in a position to handle the inspection of a large percentage of

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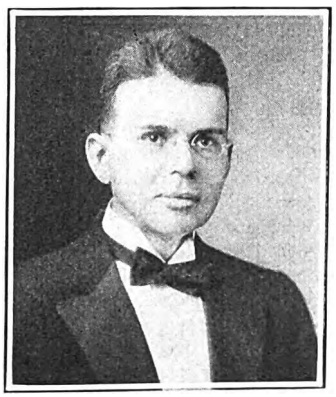
stocks materials which will satisfy the requirements. It is also the duty of the purchasing or stores department to bring to the attention of the engineering or testing department the receipt of materials on which testing instructions have not been received or which should be tested before being accepted.

The following subjects are recommended for consideration by the committee on purchases and stores for the year 1928: (1) Review existing purchases and stores sections of the Manual for revisions and corrections, (2) study the advantages and economics of unit piling and standard packages and recommend a suitable system for use on electric railway properties, (3) study investment in material and supplies and the cost of operating stores, (4) recommend methods and practices for keeping price records and pricing materials and supplies received and issued.

The report was signed by J. Y. Bayliss, A. S. Duncan, A. L. Fischer, B. W. Forkner, F. A. Jordan, P. F. McCall, T. H. McGarry, W. E. Scott, C. Thorburn, W. J. Walker, A. E. Hatton, secretary, A. A. Ordway, vice-chairman, J. Fleming, chairman, and P. V. C. See, sponsor.

Heavy Electric Traction

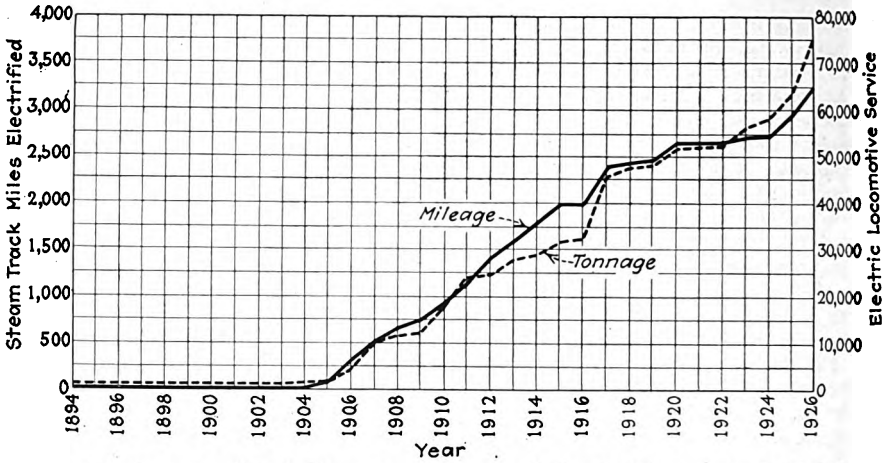


H. F. Brown

SEVEN subjects were assigned to the committee. The study of track and third rail bonds for heavy traction work was continued. It was felt that information on the use of supplementary negatives as an appendix to the tabulation prepared last year of bond practice of electrified steam roads and heavy traction lines will be a valuable addition to the information on track bonding. A questionnaire covering data desired has been prepared.

Information is being collected on the various factors involved in contact resistance. This subject requires some research and the compilation of data not readily available at the present time.

There is no information available as to the extent of reapplying bonds. In some cases pin expanded bonds are reapplied after again milling the terminals and using oversize expansion pins. A number of properties make a practice of removing and reapplying gas-welded bonds. It is recommended that this subject be continued.



Electrified steam railroad mileage and tonnage of electric locomotives, 1894-1926

It was understood that some experiments had been conducted in Europe with the thought that by applying a coating to the rail and joint plate the necessity for rail bonds might be overcome. Nothing of this sort has proved successful. It is possible that more information may be developed on this subject.

Some tests have been conducted to determine the current carrying capacity of the different types of rail bonds. The tests have not been conclusive due to the short sections of rail used conducting heat from one bond to another. The set-ups are hard to make and the problem is further complicated by splice-bar design, bond length and rail sizes. It is recommended that this subject be discontinued.

Information concerning rail joint clearance and its effect on rail bond design was presented, showing several shapes and types of rail bonds serving the same purpose which are made necessary by variation in the design of angle bars.

Drawings of a large number of angle bars have been secured and these will be used in compiling information. It is recommended that this study be continued.

Pursuant to action of the committee, the bibliography of heavy electric traction prepared by the committee was turned over to the New York Library, and its publication has now been authorized. It is hoped that it will appear in the library bulletin early in 1928. Publication will continue serially until the entire bibliography is complete.

Data on branch line electrification and self-propelled cars and locomotives were published in the report, bringing the subject up to date.

Information on articulated trains operated by nine different companies has been obtained, and brought up to date. The data now cover all such units as the committee found were being operated in the United States, Canada and England. No further information, other than named, has been forwarded to date from foreign countries. Articulated train units are now in operation in street car service, subway service and steam road service and have recently been added to high-speed interurban service. The units actually operating in the heavier services are still comparatively new and limited in number. Further comparative operating data of value are not yet available.

On account of the errors in the tabulation of data on electrification, electrified steam mileage and electric locomotive tonnage on steam roads appearing in last year's report, the committee revised the existing tabulation, retaining the same headings and including news items covering this year's progress. The committee has also brought up to date the chart, which was last published in the 1925 report, showing the growth of steam railroad electrified mileage and electric locomotive tonnage in heavy traction service in the United States and Canada. This chart appears herewith.

The report was signed by A. H. Armstrong, H. W. Cope, A. H. Daus, John C. Davidson, J. H. Davis, J. V. B. Duer, H. H. Febrey, James T. Hamilton, William E. Huber, E. C. Johnson, John O. Madison, M. W. Manz, L. S. Wells, A. H. Woollen, Morris Buck, secretary; J. M. Bosenbury, vice-chairman; H. F. Brown, chairman, and F. H. Miller, sponsor.

Unification of Car Design

H. H. Adams

SINCE the progress report was circulated, following a meeting of the committee held on Jan. 6, there has been considerable development in the subject of car and equipment design. Interest is increasing and considerable experi-

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mentation is under way. The committee believes that its function at the present time should be that of following closely the development and directing thought along these lines, rather than preparing a more elaborate report.

The report was signed by J. A. Brooks, C. A. Burleson, W. J. Clardy, L. J. Davis, C. Gordon, J. W. Hulme, G. L. Kippenberger, J. Lindall, V. Willoughby, A. L. Kasemeier, A. P. Jenks and H. H. Adams, chairman.

Way and Structures Division

THE committee held three meetings during the year with chairmen of special committees present for the purpose of discussing their assignments and giving them the benefit of such suggestions as the standard committee might make. This policy was a change from that which was followed the preceding year, when no meetings were held, and it is believed that the results obtained under the new plan were much more satisfactory.

In the case of special committee No. 2, the way and structures committee approved the following specific recommendations, involving revision of existing Manual sections:

(a) Revision of W-108-23 to agree with A.E.R.A. specification regarding countersinking of rivets.

(b) Revision of clause 402-B in W. 105, 106, 107, 108 and 109-23 changing depth of flangeways.

(c) Revision of clause 403, same Manual sections as above, covering depth of groove.

(d) Addition of a new paragraph to clause 403 in above specifications covering the matter of continuous flange bearing.

The standing committee voted to amend clause 401-b-4, Manual section W. 1-25, to read: "No variation will be allowed in dimensions affecting the fit of the splice bars except that the fishing template approved by the purchaser may stand out not to exceed $\frac{3}{32}$ in. laterally."

The experiment in reorganizing the Engineering Association with a group standing committee supervising the special committees in its own division and passing upon standards submitted was first tried out in the way and structures division during the year 1925-1926. It was but natural that the first year's operation under the new plan was not all that might have been desired. Profiting by the first year's experience, some modifications in the procedure followed were made during the past year's operation, with decidedly beneficial results. It is the opinion of the committee, as the result of two years' experience with the new method of handling the work in its division, that it would be well to definitely fix the procedure to be followed in taking letter ballots so as to standardize this for all standing committees. It is recommended that clause 505-d of the regulations governing committees be revised to read: "Before any recommendation of a special committee shall be placed before the association for adoption, it shall be approved by letter ballot by at least a two-thirds vote of the standing committee of the division in charge. Such letter ballot shall be taken in the following manner: In sending out a report for ballot, two weeks shall be allowed from the date of transmittal within which all members of the standing committee must submit their initial ballot to the chairman, with a copy to every other member of the standing committee. A further period of ten days shall then be allotted for submitting a final ballot, thus giving an opportunity for every member to reverse his original decision should he so desire. Furthermore, if any recommendation of a special committee involves more than one division (as may occasionally be the case) approval must be similarly obtained from the other interested divisions."

It is the opinion of the committee that if such procedure is adopted there will not only be a uniformity on the part of all standing committees in taking such letter ballots, but there will also result a more intelligent ballot in each case, as there will be presented a definite opportunity to reverse an original ballot in the light of such opinions as may be expressed by the other members of the committee in their original ballots.

The report was signed by C. A. Alden, E. B. Entwisle, W. G. Hulbert, E. J. McIlraith, J. R. McKay, H. F. Merker, C. A. Smith, A. T. Spencer, H. M. Steward, W. W. Wysor, E. M. T. Ryder, vice-chairman; H. H. George, chairman.

Alloy Steels Other than Manganese in Special Trackwork

FOR a number of years manganese steel has been regarded by the industry as an approved product for use in special trackwork. Production is economical, fabrication is easy and a uniform product is secured. A number of roads have had quite unsatisfactory experiences in attempting to build up and repair manganese steel in special trackwork and considerable controversy has taken and is still taking place over the possibilities of making uniformly satisfactory repairs to this class of steel. This, together with a desire to secure a material which could easily be machined in a track shop, has evidently resulted in a search to secure, if possible, a substitute.

A number of manufacturers have intimated to the committee that they are ready and willing to adopt a new alloy steel for use in special trackwork, provided it can be manufactured as economically as manganese steel and in such tonnage as would justify the training and organization of crews. Being familiar with the qualities of chrome nickel steel as applied in directions other than for trackwork and with a knowledge of its sensitiveness in handling during manufacture and the difficulty in securing a uniform product, they advise that it should supersede manganese steel only after it has proved itself more serviceable and to present a higher resistance to shock and abrasion under service.

The committee, therefore, decided to proceed with investigations to cover the following points.

(a) Comparative prices of alloy steels in special trackwork layouts.

(b) Road tests or experience under service with alloy steel layouts already installed including the securing of records and comparative wear of manganese and other alloy steels in existing layouts and on test pieces and layouts to be installed during the current year.

(c) Practical tests of comparative superiority of weldability of manganese and other steels and a study of records from the use of various kinds of welding rods.

(d) Laboratory tests on welded section of alloy steels.

In general, manufacturers have produced only chrome nickel special trackwork in substitution for manganese steel and the cost to manufacture has been somewhat higher than the standard manganese steel product. Layouts, however, have been furnished to the industry for test purposes at about the same price as quoted for manganese steel.

The committee has, through the courtesy of manufacturers and the cooperation of users, been able to secure information as to location, date and conditions of installation, and some wear data on practically all of the special trackwork pieces and layouts which have been fabricated in alloy steels, other than manganese, and which have been installed in the United States and Canada up to the date of this report. With the exception of some recent experiments with chrome molybdenum steel, all layouts furnished in other than manganese steel were manufactured of chrome nickel steel. Nearly all of the layouts, records of which have been secured by the committee, have been manufactured to specification, an abstract of which is as follows:

Chemical Analysis:	Per Cent
Carbon	0.45 to 0.55
Manganese	0.60 to 0.80
Phosphorous	Not over 0.05
Sulphur	Not over 0.05
Silicon	Not over 0.40
Chromium	Not less than 0.80
Nickel	Not less than 2.75

Physical Qualities	Not Less Than
Elastic limit, pounds per square inch	60,000
Ultimate tensile strength, pounds per square inch	100,000
Elongation in 2 in., per cent	12
Reduction of area, per cent	17
Minimum Brinell hardness	200
Metal thickness of treads, inches	1½
Metal thickness of throatways, inches	⅞
Metal thickness of base at outer edge, inches	½
Metal thickness of base at web, inches	⅜

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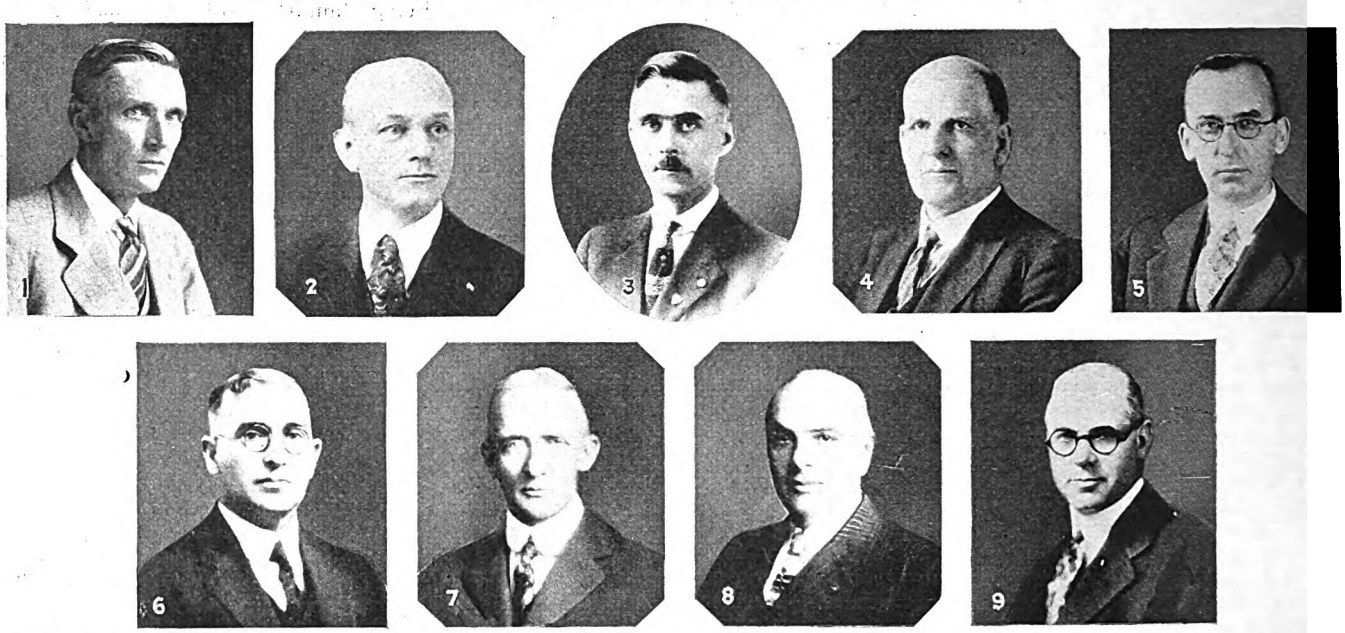
Committee Chairmen, Way and Structures Division



1. S. C. Baker 2. W. R. Dunham, Jr.
3. H. H. George 4. C. H. Clark
5. H. E. Bachman
6. A. T. Spencer 7. E. M. T. Ryder
8. C. F. Gailor 9. W. W. Wysor
10. A. E. Harvey

The committee understands that chrome nickel test pieces, including some of the earlier installations, noted below as having failed, were manufactured with a chromium percentage of 0.50 and a nickel percentage of 1.25, but dynamic and endurance tests have indicated that the higher chromium and nickel, as noted above, makes the steel more resistant to shock.

Information secured as the result of a questionnaire is somewhat conflicting. The committee has arranged to have five special trackwork manufacturers make up as requested a number of pieces of manganese steel and of chrome nickel steel for welding tests. It has also arranged to have these welding tests made by experienced welders on five electric railway properties.

The committee believes that the possibilities from the use of alloy steels other than manganese in special trackwork are such that the question should receive further consideration than it has been able to give. It therefore recommends (1) That observations should be continued on installations of chrome nickel steel in special trackwork; (2) that the experiments suggested be carried to a conclusion.

The report was signed by R. B. Fehr, F. G. Hibbard, E. F. Kenney, P. A. Kerwin, B. P. Lagaré, R. H. Noderer, O. C. Reyfuss, F. B. Walker and A. T. Spencer, chairman.

Tongue Switch and Hard Center Plates

COMPLETE detail drawings are submitted for a "100-ft." solid manganese switch, showing the general plan, the plan of heel, sections at heel and pin-holding device. Full-size iron models of the switch tongue heel were made to aid in studying its practical action.

The type of heel and heel-fastening device is novel in several particulars, but is believed to be thoroughly sound and to present several marked advantages. The heel or pin is of the tadpole type of 9½-in. diameter and is carried down to a bed on the base of the 7-in. casting. This provides a vertical wall of large dimensions which resists any forward motion of the tongue under trailing traffic. The distributed wear on this wall will be very slight, even if the holding device is not kept in operative condition, so that the joint between heel of tongue and casting should not increase materially during the life of the switch.

The supporting area under the heel is as large as in any previous design and is located with special effectiveness, as the extreme rear portion has a bearing directly at its edge, as the recess under the casting back of the pin makes it possible to grind the bed true at this point.

The fastening device holds down and back as well. It consists of a lever held in place by a bolt which is readily accessible. The lever makes contact with the heel on an inside diaphragm at the center of revolution, thus providing rolling motion instead of frictional wear. The diaphragm also stiffens up the floor of the heel. Drawings of this switch were published in ELECTRIC RAILWAY JOURNAL, Sept. 24.

In the study of hard center plates the committee decided not to take up the question of methods of fastening the plates down to the castings, but to consider the surface areas required to take care of tread widths, proper supporting pressures, etc.; also to consider the possibility of selecting a limited number of sizes, each size to serve between given limits of frog angles; also to consider plate thickness, depth of grooves, taper of inclines, etc. The committee has agreed on the limits, dimensions, etc., referred to above and they are shown on a drawing submitted.

The committee recommends:

1. Approval of tongue switch design as "recommended design."
2. Continuance of subject with instructions to prepare designs for radii other than 100 ft.
3. Approval of center plate dimensions as "recommended design."
4. Discontinuance of subject.

The report was signed by C. A. Alden*, J. U. Bragg, E. B. Entwisle*, R. B. Fisher*, H. F. Heyl, William G. Hulbert, M. M. Johnston, D. R. Payne, G. A. Peabody*, E. P. Roundey, W. W. Wysor* and E. M. T. Ryder, chairman.

Track Ballast and Drainage

AT THE beginning of its study it was the opinion of the committee that previous reports could be reviewed and brought up to date. It was found, however, that all phases of the subjects under consideration were not covered and that standard practices with reference to ballast, rail, etc., had been changed on a number of properties.

**With reservations.*

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It was decided, therefore, that the only way to get data on present-day practice was to send out a questionnaire. The answers indicate not only a very wide range of practice, but also a wide difference of opinion as to what the individual or standard construction should be. This was naturally to be expected and is due, in a large measure, to local conditions. It shows clearly that any specifications or recommended designs which might be adopted should be very broad in their scope, so as to permit of wide latitude in the selection of a suitable design, materials and methods.

The committee recommended that the subject be reassigned to the ensuing committee with instructions to continue the study.

The report was signed by E. J. Archambault, Louis T. Botto, A. C. Eddy, C. L. Hawkins, J. H. Haylow and S. Clay Baker, chairman.

Light Section Rail

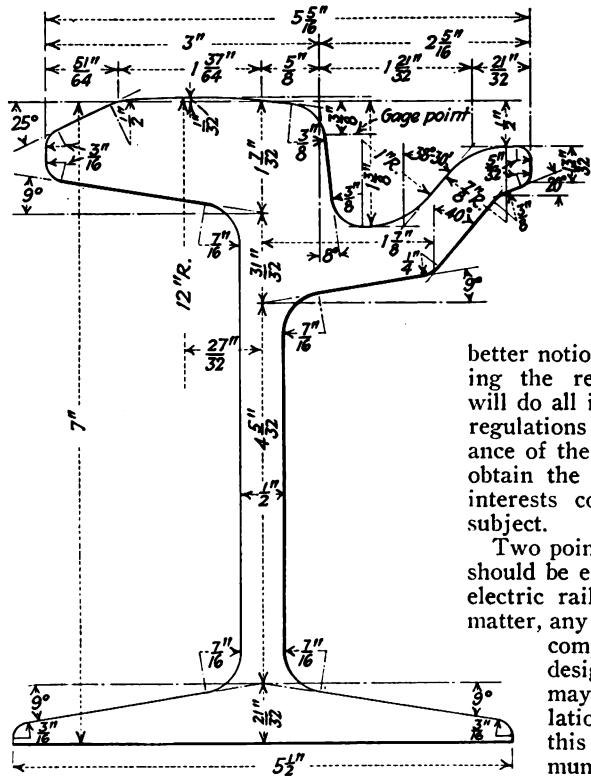
IN ITS investigation of the desirability of adopting a standard light rail the committee secured statistics of the production of 7-in. grooved girder rails by the two American producers. These figures are given in an accompanying table.

The present standard rail has been available since 1913. While it has secured extensive use, constituting 76.24 per cent of Bethlehem's production and 50.04 per cent of Lorain's, the production of other sections is evidence of an insistent demand for a lighter section. Examination of the statistics show that the section known as Bethlehem 287A or Lorain 103-478 has been most largely used. This section has the rounded head similar to the present standard. The tram portion which receives the vehicular traffic is thinner and narrower. This is in line with the change in vehicular traffic. The base is also thinner and narrower. These differences reduce the weight to 103 lb. per yard.

PRODUCTION OF GROOVED GIRDER RAILS

	Bethlehem*		Lorain	
Weight per Yard	Section No.	Production Percentage	Section No.	Production Percentage
89.....	412	.....	89–439	0.01
90.....	....	.....	90–392	.....
90.....	243A	.....	90–471	.....
93.....	....	.....	93–419	1.58
95.....	....	.....	95–376	.....
95.....	....	.....	95–479	.....
96.....	....	.....	96–357	0.01
	....	.....	97–420	0.64
97.....	402	.....	97–424	6.42
	.....	.....	97–527	2.08
101.....	....	.....	101–486	.....
103.....	287	.....	103–426	.....
	287A	12.07	103–478	11.16
105.....	295	0.47	105.481	1.18
105.....	405	.....	105–484	0.93
114.....	....	.....	114–393	1.14
114.....	....	.....	115–462	.....
115.....	....	.....	115–508	0.51
116.....	292	5.09	116–434	6.50
	....	.....	116–494	2.26
120.....	....	.....	120–442	.....
122.....	407	.....	122–467	0.10
A.E.R.A standard	407A	76.24	122–491	50.04
128A.E.R.A standard	404	6.13	128–456	15.44
		100.00		100.00

* Rolled in period 1922 to 1926 inclusive.



Proposed design for 7-in., 103-lb. girder rail

Adoption of this section as an association standard would tend to eliminate the other light sections and to secure the advantages of simplified production in this field. The committee concludes that it is necessary and advisable to adopt a 7-in. grooved girder rail lighter than the present standard and that the section known as Bethlehem 287A and Lorain 103-478 is most suitable for that purpose.

The report was signed by B. R. Brown, H. M. Flanders, C. G. Keen, E. B. Entwistle, vice-chairman; C. A. Alden, chairman.

Motor Bus Garage Design

IN CONSIDERING this subject the committee made a study of tentative regulations for the construction and operation of bus garages already prepared by a special committee of the N.F.P.A. A conference was also held with the National Fire Protection Association committee on motor bus garages and hazards and members of our committee were supplied with a copy of a tentative draft of regulations prepared by that committee. All our committee members considered these too stringent or requiring clarification, and many of the changes suggested in the memorandum prepared by our committee were received by the N.F.P.A. committee and incorporated in the third draft submitted to the convention in Chicago.

Substantial agreement has been secured on many features of the regulations. However, notable exceptions are to be found in sections governing areas, wall openings, heating, and ventilating, more particularly the latter. A natural draft system under the regulations is a practical impossibility. Many of the objectionable features are discussed in an article by Mr. George appearing in the June issue of *Bus Transportation*, pages 338-339. Those who have not read this article are urged to do so in order that they may gain a better notion of the importance of studying the regulations. This committee will do all in its power to obtain proper regulations but the thoughtful assistance of the whole industry is needed to obtain the best possible results for all interests concerned in so important a subject.

Two points relative to the regulations should be emphasized. The first is that electric railway operators, or, for that matter, any owners, are not in any sense compelled to follow them when designing garages. An owner may choose to follow the regulations when adopted, and in this event will receive a minimum insurance cost, or he may design as conditions warrant, transgressing stipulations in the regulations, thus incurring for himself an increased premium cost comparable to the extent to which he does not follow the regulations. There are times in design when it is both proper and economical to take a penalty rather than carry out specific provisions in the regulations. The second point to be emphasized is that state and municipal ordinances, where such are in effect, naturally take precedence over these regulations. It is suggested that, since these are obligatory, they be checked to make certain that they are not being violated.

Outside doors should be of such a type that they will be reliable and will operate conveniently. The width of door will depend upon whether one or two or more vehicles are to be accommodated. A practical width is one providing at least 2 ft. of clearance on each side of the vehicle. This committee recommends an opening of not less than 16 ft. for one bus and 24 ft. for two buses. Where sliding type doors are used there should be ample leeway for clearance.

The height of doors for single-deck buses should be at least 11 ft. and for double-deck buses should be at least 14 ft. The former height does not permit tower trucks to enter. It is desirable to make the height sufficient to care for any vehicle that might be brought into the building for repairs and for that reason the question of whether the door should be such as to permit a tower truck entrance should be given consideration.

The best types of doors are those embodying these features: quick, easy and economical operation, clear openings (i.e., occupying, when open, the minimum of useful space), convenience and safety, automatic opening and closing.

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A mechanical operating device, such as a push button regulating the opening and closing of doors electrically, gives the greatest satisfaction and the best results. Such a control makes possible the stopping of the door at any point in its travel. A push button control which must be held in during the time the door is opening or closing gives the greatest measure of safety. The control should be conveniently located, preferably inside under an operator's care and charge. The control should automatically stop the opening or closing if the door meets an obstruction in its travel.

Where all wood doors, of sliding, swing or accordion type are used one of the leaves should not exceed 6 ft. in width. This may be increased to 10 ft. if substantial steel framing is used.

All metal doors are more expensive and require more substantial supports than do other types. They are also more difficult to repair when damaged. Such doors, however, when properly installed, give better satisfaction and results because they stay in shape.

The committee believes that, generally, best results are obtained by using some form of horizontal sliding door with suitable guide rigging at the top and supported and operated on adequate wheels and track at the floor. The floor guide should be slightly rounded and above the floor rather than a groove. The wheels should be flanged to operate over the guide.

The committee included a drawing of a bus washing machine used in Edinburgh, Scotland. It also presented plans of two garage layouts. One was of 20,000 sq.ft. for 56 buses, the other was of the Frankford bus garage of the Philadelphia Rapid Transit Company with ultimate capacity for 214 buses.

The washing machine can be used for all vehicles from a small two-seater car to a 52-seater double-deck omnibus. It covers approximately 495 sq.ft. of floor space. The extreme outside length is 29 ft. and the width between inside of island curbs is 7 ft. 9 in. These islands serve as the foundation for the frame of the machine. Rounded at the ends they contain a trough, 18 in. wide by 6 in. deep, which extends the whole length of each island.

The two center pipes on each side, are movable and, being coupled together, are actuated by lever handles. This arrangement permits of the lowering and raising of the spray of water as required.

The number of men required to operate the machine is three, one at either side to manipulate the spray handles, and the third at the front end to wash the bonnet and front part of the body. The time occupied in washing a bus is four minutes, as compared with twenty minutes under the old method, and the quantity of water used per bus has been reduced from 150 gal. to 100 gal. each. The water pressure is approximately 100 lb. per square inch. [Further particulars of this machine will be published in a later issue of this paper.—Ed.].

Pressure systems are, in part, or wholly, more or less widely used. Such systems are not altogether suitable for body washing. They do a very good job on the washing of parts under the bus body, trucks, etc., but frequently damage the body paint.

Some companies are experimenting with substances producing a dry wash applied in solution form much as a polish, but the committee does not yet have authentic data to show the results obtained.

The report was signed by A. J. Blackburn, G. H. Haldeman, A. Hughes, Jr., L. F. Parlette, W. W. Wise, and J. R. McKay, chairman.

Effect of Rubber-Tired Vehicles on Pavement

QUESTIONNAIRES were sent to representative member companies throughout the country and replies received from practically all, containing a variety of opinions, all of which, however, tended along the same general line and to the conclusions which were finally arrived at by the committee.

In reply to the question as to whether there was an increase in the number of failures of street pavement within the railroad areas which are attributable to the increased use of heavy rubber-tired vehicles, a number of member companies reported there had been no noticeable increase. The majority, however, reported there was an increase in the number of paving failures due to this cause, in some cases to the wearing surface, but in general the failures could be traced directly to the fact that the paving foundation was too light for the heavy vehicular traffic of the present day. It appears that there is no increased wear to the paving surface on account of the use of rubber-tired vehicles carrying ordinary loads.

Inquiry as to the types of pavement now used brought a variety of answers showing the tendency in heavy traffic areas to continue the use of granite block and brick paving, wearing surfaces which are the least affected by the increased wheel loads. Concrete paving is coming into more general use, as it provides a smooth riding surface and has the advantage of combining the wearing surface and base into one solid slab. Asphalt paving is being used by a number of street railways and is giving satisfactory service. Creosoted wood block paving has shown the greatest relative wear under heavy vehicular traffic loads and many companies have discontinued its use.

In general there is a decided tendency to adhere to the usual wearing surfaces, with the exception of creosoted block, and to increase the depth or strengthen the paving foundation, in some cases by introducing reinforcing in the slab, as all companies have conceded the fact that the life of the pavement depends largely on the foundation.

Regarding the cross-sectional contour of the top surface of paving in track area, it was formerly the practice in many cities to crown the pavement between the rails and in the case of T-rail track to lay the paving on the gage side to meet the underside of the head of the rail. The majority of the companies have found that the best results may be obtained by laying the paving in a plane surface, level with the tops of the rails, thereby eliminating the impact from heavy wheel loads, which is injurious to the pavement and track structure, especially at street intersections.

The use of rubber tires has introduced a hazard in operation over asphalt pavements, on account of skidding, which did not exist with the use of steel tires, and this feature is receiving consideration in some localities, with a tendency to use surfaces which have a better holding effect upon the tires.

The conclusions of the committee are that damage is being done to track pavement due to the use of rubber-tired vehicles which permit excessive concentrated loads and further that such vehicles generally travel at high rate of speed, with abrupt acceleration and stops, all of which has a detrimental effect on the pavement.

The committee recommends that in cities where paving failures occur in the track area a request be made to the proper city or state authorities to check up on the loading of trucks, buses and other vehicles above the maximum weight permissible for various types of trucks, etc.

The report was signed by N. R. Alexander, C. W. Burke, W. G. Matthews, W. L. Wilson and A. E. Harvey, chairman.

Track Construction

In Co-operation with A.S.M.I.

DURING the year 1923 specifications for street railway track construction prepared jointly by a committee of the American Electric Railway Engineering Association and a committee of the American Society for Municipal Improvements was approved by the A.E.R.E.A. and published in the Manual as a "Recommended Specification." These specifications were adopted by the A.S.M.I. by letter ballot in 1924. During the year 1925, however, certain drastic changes in these specifications were recommended by certain members of the committee on street railway pavements and track construction of the A.S.M.I. and these changes were embodied in a report submitted by these members to the convention of the A.S.M.I. in October, 1925. A representative of the A.E.R.E.A. appeared at this convention and requested that the suggested modifications be given further consideration and if alterations were found advisable such changes should be passed on by a joint committee of the A.S.M.I. and A.E.R.E.A. before submission to A.S.M.I. for approval. This suggestion was adopted and the matter was referred to a new committee.

Since the reference of the matter to the new A.S.M.I. committee various suggestions were made by the members of the A.E.R.E.A. committee and it was clearly shown that the proposed changes were not warranted. The A.S.M.I. com-

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mittee, after careful consideration, did not deem it wise to recommend any changes in the present specifications. It was thought that it would be well to allow these specifications to stand for a few years or until a real need for their revision is shown. In the meantime this committee will consider carefully all matters pertaining to tracks submitted to it. If complaints should be made by members of the A.S.M.I. that certain details of track construction work are not satisfactory the committee, working in conjunction with the committee of the A.E.R.E.A., will furnish to the complainant information as to the locality where similar types of construction are in successful use, and with this information complainants can determine for themselves the reason for the troubles. If, for any reason, the committee is unable to give locations where the type of construction under criticism is in successful use, modifications of the specifications might prove advisable.

The report of the A.S.M.I. committee was adopted. Apparently there will be no attempt made this year to change the specifications for street railway pavements and track construction by the A.S.M.I. The A.E.R.E.A. committee recommends that the subject be reassigned to an ensuing committee with instructions to co-operate with the A.S.M.I. in matters pertaining to specifications for street railway pavements and track construction.

The report was signed by W. R. Dunham, Jr., Howard H. George, E. M. T. Ryder, W. W. Wysor and C. L. Hawkins, chairman.

Rail Corrugation

DURING the current year the committee has continued its accumulation of data from test sections of track. The co-operating companies are so widely distributed geographically that the track sections now under observation permit the accumulation of data for a wide range of climatic, construction and operating conditions. The data accumualted so far have not been analyzed and digested in detail, as it is desired to secure data covering a longer time before attempting a detail study.

Last autumn at the Barcelona meeting of the International Association of Tramways, Urban and Interurban Railways and Public Autobus Transportation a sub-committee of the international committee on standardization of rails and track equipment presented a valuable and rather extensive report on the subject of rail corrugation, or as they call it in continental Europe, "undulatory wear of rails." There appears to be a rather general agreement between the tentative findings of the foreign committee and those of your committee.

From the mitigation standpoint the foreign committee seems to be centering its attack on the problem of improving rail quality. It believes that corrugation is caused by frictional wear and periodic impact blows, and therefore to resist corrugation the rail should be capable of resisting both frictional wear and crushing. These requirements call for a rail metal which has a high elastic limit in order to withstand impact blows without permanent deformation and a high work of rupture in order to withstand the tearing off of particles, or abrasion. The work of rupture is measured by the area under the stress-strain diagrams obtained in a tensile strength test:

In making physical tests on test specimens cut from corrugated and non-corrugated rails the foreign committee found that for each specimen of corrugated rail the work of rupture was relatively low and for the non-corrugated rails relatively high. The idea of work of rupture as an item in the specifications for rail steel seems to be a new and important one from the standpoint of mitigating corrugation.

Foreign test data, analyses of data collected by this committee on its inspection trip in 1925, results of studies of hardness of rail surface, physical characteristics of corrugations and vibration of track and equipment are presented in a series of appendices.

As a result of its study of the various data and information presented with this report the committee makes the following tentative suggestions relative to corrugation mitigation:

1. Increase the contact area between the wheel and the rail. This will reduce the localized stresses which produce cold working and abrasion.

(*a*) Select wheel and rail contours such as will give maximum area of contact.

(*b*) Tilt the rails so that the heads are inclined inward slightly.

(*c*) Use wider wheel treads and larger diameter wheels.

2. Minimize car nosing.

(*a*) Keeping a proper relation between wheel and track gages.

(*b*) The use of properly shaped wheel and rail contours.

(*c*) The use of longer wheel bases.

(*d*) Keeping the "play" out of bearings.

(*e*) The use of longer cars or cars with a greater distance between truck centers.

3. Minimize vibration and impact loads.

(*a*) Better track and rolling stock maintenance.

(*b*) Minimizing the unsprung weight.

(*c*) Minimizing wheel vibration.

4. Minimize wheel slippage.

(*a*) Maintain equal diameters of wheels rigidly fastened to the same axle.

(*b*) Use independently coupled wheels and in case of trailers, loose wheels.

(*c*) Minimize car nosing.

(*d*) Use wheels with properly shaped contours.

(*e*) Avoid extra tight or extra loose track gage.

5. Improve the surface of the rail head.

(*a*) Accepting only straight rails from the mills.

(*b*) Keeping the tracks free from sand, gravel and other street debris.

(*c*) Grind the rolling surface smooth before putting the track into operation.

(*d*) So constructing the track that the rail heads will be slightly above the paving level.

The committee realized that many of these suggestions are impractical in specific cases. The apparent and immediate causes of corrugation as far as they may be determined by the data now in hand are the cold working and abrasion of the rail head surface caused by the irregularity of the rolling of the wheels and by the vibration of the rails and rolling stock, imposing excessive loads on small areas of the rail surface.

As to the removal of corrugation, the best information in the possession of the committee seems to be that the corrugations should be ground out as soon as they appear and that the grinding should be so done as to maintain a maximum area of continuous wheel-rail contact and to maintain this area centered within the "middle third" of the rail head.

The committee believes that the collection of data from the test sections of track now under observation should be continued and that some experimental sections of track should be installed with the end in view of determining a type of track construction which will better resist corrugation than do existing types. It also believes that the vibration studies should be continued and that certain physical laboratory tests should be made on specimens from corrugated and non-corrugated used rails.

The report was signed by C. H. Clark, E. B. Entwisle, D. D. Ewing, secretary, R. B. Fehr, H. Fort Flowers, C. R. Kinnear, T. J. Lavan, E. L. Lockman, A. M. Nardini, J. Ormondroyd, H. Jackson Tippet, Claude L. Van Auken, H. S. Williams, vice-chairman, and W. W. Wysor, chairman.

Rails

RELATIVE advantages of 7-in. rail and 9-in. rail are outlined in the report of the committee, but no attempt has been made to prescribe the use of either type. After considering the varied conditions under which 7-in. rails have been selected, the committee finds them to have the following advantages:

1. This rail, on account of its lesser depth, requires less excavating and in most instances requires less material to be installed in the way of foundation and structure.

2. For a specified weight per yard a 7-in. rail with a proper distribution of metal would afford considerably greater lateral stiffness on account of the base and head being heavier. Similarly, the 7-in. association standard rail compared with the heavier 9-in. association standard rail has almost the same moment of inertia about a vertical axis in spite of its lesser weight. Lateral stiffness of a tangent rail in track is very helpful in maintaining pavement, while at the same time, it reduces the need for tie rods. When paved with granite the 7-in. rail requires less reinforcement

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from the tie rods than does the 9-in. rail. When asphalt pavement is used. many railway companies are, on account of the concrete going to within 3 in. of the top of the rail, no longer using tie rods.

3. If rails are to be welded in tracks, the cost of the welding in many of the modern methods is cheaper for a 7-in. than for a 9-in. rail. While it might be argued that the weld in the 9-in. rail will give greater strength than the weld in the 7-in. rail, it is nevertheless true that as a general thing the weld on the 7-in. rail has more than sufficient strength for its purpose.

4. When repairs are necessary, a 7-in. rail affords cheaper maintenance, because less paving material must be broken away and later restored. Where there is a concrete base for asphalt pavement, this is a considerable item.

5. Seven-inch rail requires about 10 per cent less tonnage per unit length of track. If the 9-in. rail offered sufficient advantage, this question might be ignored, as the added cost might be justified, but other things being equal this item is considerable.

6. The drilling in the 7-in. rail lies more nearly along the neutral axis than in the 9-in. rail and for that reason weakens the rail less. This may seem of little consequence, but breaks through bolt holes are not unusual.

7. For such companies as have occasion to bend rail, the 7-in. rail affords greater economy on account of greater ease in bending. While the moment of inertia of the section about a vertical axis is not so much greater in a 9-in. rail than in a 7-in. rail, that about the horizontal axis is very much greater in the 9-in. rail, and this would add largely to the cost of rail bending because of the vertical set required in connection with lateral bending. Those who do not bend their own rail would therefore expect to pay more for curved rail if it were 9-in. instead of 7-in.

8. The matter of transporting rails from supply yards to the job would show considerable advantage in favor of the 7-in. rail, as to both cost and convenience of handling on account of the greater ease of loading and handling with the consequent less likelihood of accidents to men.

Advantages of 9-in. rail are:

1. While a 9-in. rail requires a deeper splice bar and more bolts than does a 7-in. rail, it nevertheless provides a stronger joint. This is important in tangent track, but is more so in special trackwork, where a similar advantage is attained when cast-in arms are used. There is no doubt that a 9-in. rail cast-in is firmer and less likely to loosen than would be a 7-in. rail. The internal joints being stronger than with a 7-in. rail, there is a further advantage tending to prevent looseness of arms. This reason has been very largely recognized any many railway companies that are using 7-in. rail for tangent track cling to 9-in. rail for use in special trackwork because of extra strength thus procured.

2. Because of the greater beam strength of the 9-in. rail there is a better distribution of load over the supporting soil, which permits less deflection and therefore less disruption of foundation. It is not uncommon to find two pieces of track built under practically identical conditions on the same character of soil and with practically the same traffic, where the 9-in. rail stands up firmly for a great deal longer period than does the 7-in. rail. This result is due to the lesser deflection of the 9-in. rail. In the larger cities where there is greater congestion of traffic and where there is also more burrowing into the street, the additional strength of the 9-in. rail is a considerable advantage, not only because it is easier and safer to take care of while construction work is going on underneath such as sewer, conduit, water pipes and gas main work, but because after the work has been finished and restored in such manner as such work is usually restored, the 9-in. rail offers a far better support to the load than does the 7-in. because usually the excavations are not properly back filled and at the point where the excavation has been made there is often no support at all and the rail must serve as a bridge as well as a rail. Therefore when it is found desirable on account of soil, pavement, traffic or other conditions to use a stronger rail the additional height and weight of the 9-in. rail may be well worth the additional expense.

3. Where certain kinds of pavement are concerned, the 9-in. rail offers better facilities than does the 7-in. If a 5-in. granite block is used with a 1-in. cushion of sand, there would be with a 7-in. rail only 1 in. of concrete over the tie and this 1 in. of concrete is practically useless, as it offers but very little help in bridging the space between ties. A heavy load applied between the ties often forces the concrete through, the 1 in. concrete over the ties shearing off, if it has not already become cracked and loose from shrinkage. If the granite used is of 8-in. type, obviously a 7-in. rail would not offer sufficient space for the installation.

In conclusion it is recommended that this committee be discharged and the subject discontinued for the present and until such time as there shall arise some new reason for giving it further consideration.

The report was signed by J. U. Bragg, G. H. Haldeman, R. M. Hannaford, E. S. Myers, John F. Rodgers, Oscar Williams, and H. F. Merker, chairman.

Rolling Stock Division

FOLLOWING are the subjects referred to special committees. The chairman of each special committee has met with the standing committee on rolling stock so that the reports have the advantage of joint advice and help.

Committee No. 1, Manual Review—The report has been submitted to the standing committee on rolling stock and approved by it by letter ballot and has been referred to the Executive Committee.

Committee No. 2, Motor Coaches—The report has been submitted to the standing committee on rolling stock and approved by it by letter ballot and has been referred to the executive committee.

Committee No. 3, Study of Car Equipment with Reference to Appearance, etc.—This report has been submitted to the standing committee on rolling stock and approved by it by letter ballot, and has been referred to the executive committee, which, with the elimination of the last paragraph approved same and recommended it to be published for distribution in advance and presented on the floor of the convention.

Committee No. 4, Car Lighting—This report has been completed and submitted to the standing committee, which has approved same by letter ballot. It has in turn been submitted to the executive committee, which voted to approve the report for advance publication and for submission to the membership for letter ballot on those parts recommended to be included in the Manual. The report will also be presented on the floor of the convention.

Committee No. 5, Study Results of Roller Bearings for Trucks—Progress report will be presented at the Convention.

Committee No. 6, Lubrication—This report has been submitted to the standing committee on rolling stock and approved by it by letter ballot. It has been submitted to the executive committee for its action.

Committee No. 7, Suction Strainers—This report has been submitted to the standing committee on rolling stock and approved by it by letter ballot. It has been submitted to the executive committee which has approved it and recommended its presentation on the convention floor.

Committee No. 8, Side Wear Carbon Brushes — This report has been submitted to the standing committee and approved by it by letter ballot.

Committee No. 9, Noise Reduction—The report has been submitted to the standing committee and approved by letter ballot.

Committee No. 10, Gears—This report has been completed and submitted to the standing committee on rolling stock which has approved same by letter balloot. It has been submitted to the executive committee which has also approved it and recommended its presentation on the convention floor.

Committee No. 11, Current-Collecting Devices—This report has been completed and submitted to the standing committee on rolling stock, which has approvel it by letter ballot. It has also been presented to the executive commit-

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tee, which has approved it and recommended its presentation on the convention floor.

Committee No. 12, Journal Boxes—This report has been completed and has been submitted to the standing committee on rolling stock, which has approved it by letter ballot. It has also been submitted to the executive committee for its action.

Committee No. 13, Limits of Wear—The report has been submitted to the standing committee and approved by it by letter ballot.

The report was signed by J. A. Brooks, W. W. Brown, M. R. Hanna, J. M. Hipple, J. S. McWhirter, A. D. McWhorter, T. H. Nicholl, R. B. Smyth, W. G. Stuck, H. S. Williams, A. T. Clark, chairman, and R. S. Bull, vice-chairman.

Review of Equipment Section of the Manual

EXISTING standards and specifications referring to equipment, which are included in the 1926 issue of the Manual, were reviewed, and the following revisions and additions recommended:

E 1-26 — Design of Brake Shoes, Heads, Keys, and Gages. To provide additional clearance in the flange groove of brake shoes, dimensions of the shoes were changed. Te reduce the number of drawings in the Manual, the six standard shoes, together with heads and keys, were presented on three drawings.

E 4-23 — Dimensions for Height of Platforms and Bumpers for Interurban Cars. The committee decided that standard height of platforms for interurban cars was not needed, so the paragraph on this subject was withdrawn. Also the paragraph on standard height for bumpers, which previously was specified as 43 in., was changed to read: "The standard height of bumpers for interurban cars measured from the top of the rail to the bottom of the bumper should not exceed 43 in."

E 14-25 — Dimensions of A.E.R.E.A. Steel Wheels. To prevent misunderstanding, the following paragraph was added: "The hub diameters given in the tables of steel wheel designs should be looked upon merely as maximum limits to take care of eccentric bores. In the inspection and acceptance of wheels, the specification E 7-21 should govern in all cases, and wheels accepted or rejected on hub-wall thickness within the tolerances given in the specification."

The committee recommended the following addition to the tables in order to provide for bolting on pads to reduce noise in operation: "Four holes should be included in standard wheel designs for electric railway service in order to provide for the bolting on of pads to reduce noise in operation. When specified, these holes should be at least 1 in. in diameter and should be located on a radius approximately 2 in. from the inside diameter of the rim."

E 100-12 — Automatic Couplers for Interurban Cars and Radial Draft Rigging. To obtain information regarding the number and different types of couplers now in service, a questionnaire was sent to all electric interurban roads. Replies from approximately 125 were received and tabulated. They relate particularly to the location and installation of couplers on cars.

It was recommended that a special committee be appointed to consider this subject and that the present specifications be withdrawn.

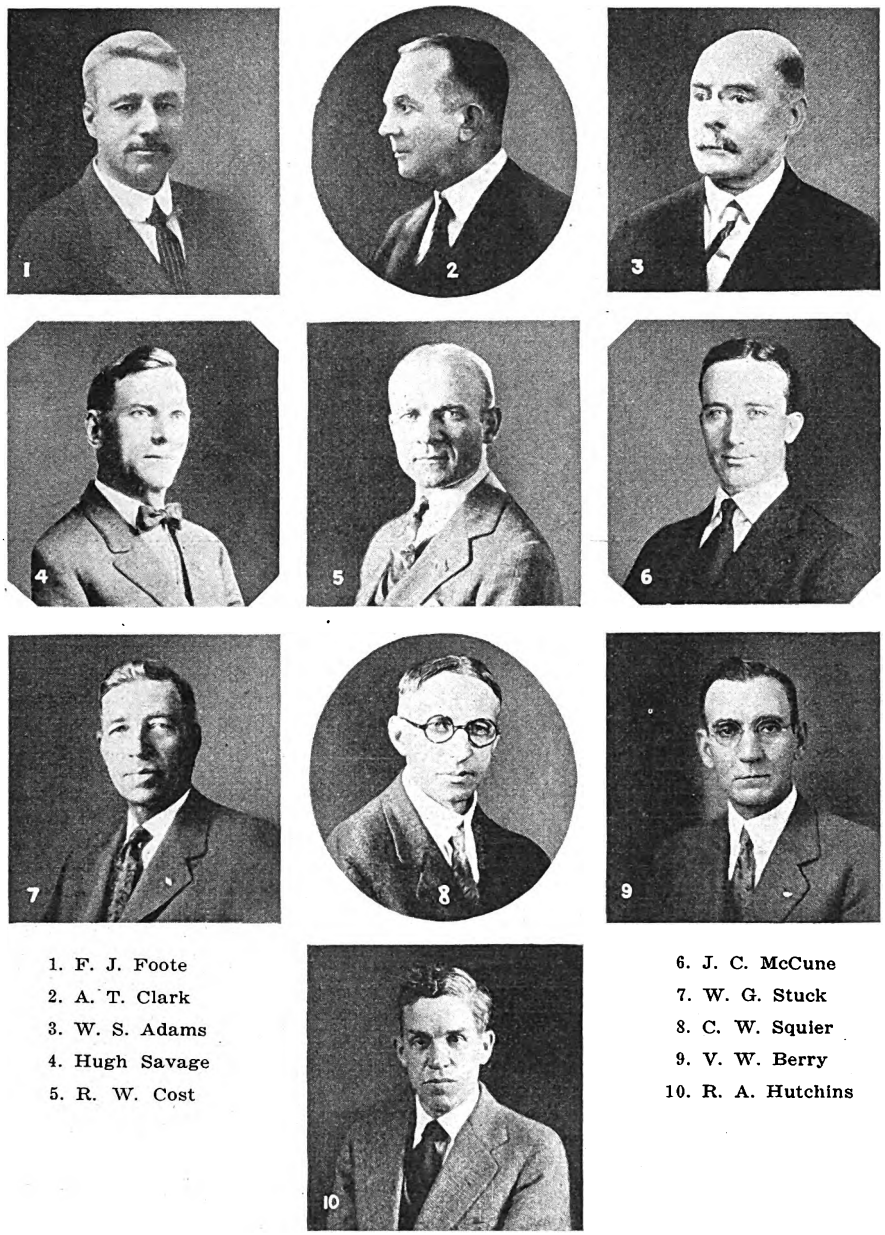
E 101-12—Specification for the Location of End Connections on Interurban Cars Used in Car Exchange Service. The drawing showing location of end connections was revised, and a new one submitted with revised dimensions.

E 216-26 — Motor Leads. To give more information regarding the recommended practice in insulating connectors of motor leads the following paragraph was added: "They may be insulated by slipping on a piece of rubber hose with ends taped to keep out water, or a method of insulation may be used, as shown in Fig. 5." A new drawing was submitted and included as Fig. 5.

In reviewing the various standards and specifications now included in the Manual the committee found a large number which have been taken from other associations. Revision of such specifications is very difficult. To lessen the trouble the committee recommended that when it is found desirable to adopt standards, specifications or recommend practices of other associations, committees of the Rolling Stock Division make no attempt to reproduce the full standard, but that some form of reference be used in the Manual calling attention to the specifications, standards or recommended practices, giving a brief summary as to what they include and information as to how copies of the standards may be obtained.

The report was signed by Walter S. Adams, Thomas H. Nicholl, H. S. Williams and Clarence W. Squier, chairman.

Committee Chairmen, Rolling Stock Division



1. F. J. Foote
2. A. T. Clark
3. W. S. Adams
4. Hugh Savage
5. R. W. Cost
6. J. C. McCune
7. W. G. Stuck
8. C. W. Squier
9. V. W. Berry
10. R. A. Hutchins

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Motor Coaches

SUBJECTS assigned to this committee are:

1. Study motor coach design and consider motor coach standardization.
2. Investigate maintenance methods and inspection schedules in motor coach operation.

The study made by the committee discloses action on the part of several organizations, including the Society of Automotive Engineers and also state regulatory bodies, in the matter of adopting standard specifications for motor coaches.

There appears to be a lack of uniformity in prescribed motor coach specifications and regulations by state regulatory authorities, which is attributed to independent thought and action on the part of these bodies. In addition motor coach specifications recognized by organizations representing the industry show a similar lack of uniformity. This points to the necessity of standardization in fundamental and controlling factors, such as over-all length, width, rear and overhang, width of doors, the location of rear-end emergency doors, etc.

While the committee is of the opinion that uniformity in design with reference to certain dimensions is important and if not carried out might seriously hamper interstate operation, the rapid development of the industry makes it appear inadvisable at this time for this committee to recommend definite standards of design and construction. To do so might curb initiative on the part of manufacturers and limit the range of specifications on the part of operators in the procurement of equipment for their needs.

The committee has reviewed the work of last year's committee and indorses the philosophy of inspection on a mileage basis. This enables maintenance to be carried out on a unit basis, results in minimum time consumed for repairs and aims to avoid road difficulties.

The advent of the gas-electric motor coach has brought about the development of an inspection and maintenance schedule applicable for this type which your committee believes will be of general interest. The schedule, which is included in the report as Appendix A, is employed by a large operator of gas-electric motor coaches.

The committee recommends:

1. That the subject of motor coach design and standardization be continued and that the committee continue the work in conjunction with standards committee of the Motor Coach Division of the Society of Automotive Engineers.
2. That the committee also consider the matter of bus design from the standpoint of unit construction and accessibility to wearing parts, which is of vital importance to economical maintenance.
3. That the committee continue the subject of maintenance methods and inspection schedules and consider prescribed standards covering limits of wear of parts as a means of efficient and economical maintenance.

The report was signed by H. L. Derbink, W. H. Downey, H. C. Eddy, F. A. Klock, L. H. Palmer, A. J. Scaife, C. W. Stocks, and V. W. Berry, chairman.

Car Equipment

IN LAST year's report this committee suggested a means of bettering the external appearance of a single-end car. Recently a car has been rebuilt to embody these recommendations. New features are a tapering of the front end to give a pointed appearance and the addition of a visor over the front windows, which not only helps accentuate this but also provides a very practical means of preventing glare in the motorman's eyes.

There is a distinct trend away from the old-style slat-covered floor. In addition to the linoleum, rubber and similar types of floor covering, attention is called to composition floorings which are applied in a plastic state with a trowel. Such a type of flooring lends itself readily to the addition of cove edging, with consequent easier sweeping of corners. Such a floor may be flushed with hose and water without fear of damage to the body or equipment. Stream-line painting is very much in vogue at the present time and it is contended that its application to cars will do much to improve their appearance from an artistic standpoint as well as giving them a modish, up-to-date air. To give cars a long, low, speedy appearance the sides of the car should be broken up into two or more bands, instead of having one solid color.

A second principle which produces a long, low appearance is the avoidance of vertical lines and bands, particularly of a dark color.

A third principle is to create tapered ends, and in the case of a single-ended car to make the front end of the car look as if it were intended to be the front end of something instead of a duplicate of the rear end. While this is largely a function of the design of the car, yet this principle is bound up inextricably with the theory of streamline painting. There is one line on the front end of a car to which little attention has been paid from the artistic viewpoint, yet its importance should be stressed. This line is the gutter over the front door. If this slopes downward toward the front, a pointed, pleasing front results, while if it slopes downward toward the rear, a much less favorable impression is produced.

The adoption of a strictly high-grade seat is recommended for both city and interurban service. The meaning of the term "high-grade seat" is intended to include a seat of the deep upholstered type with a spring or yielding back. It is recommended that the maximum height of the cushion be 17½ in. above the floor.

There is a marked trend toward individuality in seat design—that is, to make double seats resemble two seats. An example of this is the bucket type seat. Modifications of this appear in the usual type of seat back, but with two convex curves to give the appearance of separate backs and a division of some sort between the two halves of the cushion.

Due to the difficulty in adapting the higher grade seats to double end operation and the consequent necessity for a reversible type, attention is called to a swivel operation. This allows the seat to be rotated and accomplishes the same result as the reversible seat.

It is recommended that in the selection of seat covering attention be given to the adoption of material that in texture and color will convey the impression to the public of being up to date. A black leather or imitation leather is therefore less desirable than the newer shades which are not so somber and which will not show dust as much. In the textile coverings, colors should be modern and of the neutral tints which convey a restful feeling to the passenger.

In last year's report mention was made of linen slip covers for seats as a means of creating the impression of cleanliness and modern appearance. It is also a practice that may be used to cover worn upholstery and make the sets look like new. Figures are now available to show what costs may be expected with their use. The covers on one property cost less than $1 each and can be laundered for a cost varying from 2½ to 4 cents each. Their estimated life is approximately one year and it is stated that they may be used either side out.

It is almost universal practice in electric car construction to place the seats on the same centers as the car posts, so as to provide one entire window to each seat. In bus body construction this rule is not rigidly adhered to and the seats are spaced as desired irrespective of the distance between posts. This has been accomplished without serious adverse criticism and so establishes a precedent that may be followed in car construction where it is desired to use thicker seat backs with spring upholstering, or backs with greater pitch to increase their comfort. It also offers a suggestion for bettering the appearance of cars by the use of wider windows than those used at present. Wider windows have heretofore been discouraged on the basis that if a seat be provided for each window it would reduce the seating capacity materially, but this practice would allow almost any spacing of the posts.

During the past two years many experiments have been tried in the equipment of cars, both city and interurban, with better quality seats. The results of these tests are now becoming available and the consensus of opinion is that the provision of better seats is an entirely justifiable expenditure and attracts added patronage of sufficient volume to make it a paying venture. Attention is called to the need of the development of a type of seat that will provide the desired element of luxurious comfort and yet may be produced at a moderate price. A standardization of

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seat type is desirable and might help this condition, although this is thought to be impossible of accomplishment during the present stage of development, or at least it cannot be attempted until ideas of what is required become better crystallized than they are at present.

It is to be noted in connection with the use of so-called de luxe cars, or cars fitted up with high-grade seats, modern floors and the many other refinements that go to make up a high-class car, that this entails greater care in cleaning than was the case in the older and less luxurious types of car. The presence of dirt in the fine car is much more noticeable and its presence is intolerable, whereas with the poorer type of car, dirt is not of as great moment, though of course always objectionable.

Next in importance to seats in the furnishing of a comfortable ride is the item of springs and the attendant mounting details which cause the car body to ride well or poorly. There is need for study and research to improve riding qualities. Verdict on this quality should be based not upon personal opinion but upon scientific study with the assistance of a recording seismograph.

Car riders must be given a comfortable ride, so it is of prime importance that in the handling of the cars, smooth starting and stopping be practiced. There is probably nothing more aggravating to the passenger than a jerky stop. To the end that the best may be realized from the equipment, it is recommended that well-equipped instruction schools with competent instructors be provided to give embryo motormen the best possible training. It is also recommended that traveling check-up men be employed to see that the instruction is being put to the best use. Likewise it is recommended that a traveling mechanical inspector ride every car once a month to report on its operating condition.

The subject of car convenience, comfort and appearance is one of the most important questions before the equipment men today, as it embodies all of the essentials which go to make successful operation of a property as far as cars are concerned. Unless these features are given their proper consideration, the ride is not a salable commodity and the passenger will not give his patronage if there is any other form of transportation available. The need, therefore, is to furnish a vehicle with the air of luxury about it, which will create a desire in the public to ride in it in preference to the private auto.

One of the great needs of the industry is to sell its wares first to its own employees, and this means giving to them proper tools with which to carry on their work and equipment to which they may point with pride. This is the basis of successful merchandising of the car ride.

The report was signed by O. H. Basquin, James A. Brooks, John A. Dewhurst, E. J. Jonas, G. L. Kippenberger, C. R. McMahon, W. R. McRae, H. S. Williams, chairman.

Car Lighting

RECOMMENDED practice in car lighting was presented by the committee, as follows:

1. The position of the normal reading plane shall be a 45 deg. plane at a height of 33 in. above the car floor at the seats. Attention is called to the fact that in measuring intensities sufficient readings should be taken to insure a fair average of the illumination throughout the car.

2. For adequate and comfortable illumination in street railway cars, an average minimum intensity of 6 foot-candles, measured on the normal reading plane, should be provided. This value of intensity may be obtained by employing the standard Mazda lamp for electric railway service with an efficient diffusing or reflecting accessory and an expenditure of 2 to 4 watts per square foot, measured between bulkheads of the car.

3. In city and suburban cars where standing passengers may cast objectionable shadows on the reading matter of those seated, it is recommended that the lighting units be mounted directly above the seats on the sides or in combination with outlets on the longitudinal center line above the aisle.

4. For interurban cars which usually carry only a seated load, it is recommended that a single row of lighting units, consisting of inclosing domes or open-type reflectors be mounted on the center line above the aisle. In a chair car where seats are arranged with backs to the windows, the above system should be augmented by side lighting, consisting of small open type or inclosing bowl units.

5. It is recommended that provisions be made for the proper illumination of entrance and exit steps. Usually one lamp, equipped ordinarily with an efficient durable metal reflector mounted above each door, will provide for safety and minimum delay.

6. To prevent reflected glare on the motorman's window at night from interior lighting units, it is recommended that a blind or an inclosing screen be placed back of the operator. A sloping glass window will also afford relief from such glare and will enhance vision.

7. It is recommended that the head lining of a car be finished in a light color to secure the greatest possible efficiency in the utilization of natural and artificial light.

A miscellaneous method and practice on car lighting was also presented which included a number of typical arrangements. The selection of a lighting fixture, exclusive of the light source, was considered largely one of individual taste. There is no reason why any efficient lighting unit cannot be clothed with a fixture giving pleasing lines and artistic proportions without seriously affecting its illuminating efficiency.

The modern open-type fixture is equipped with a holder which grips the reflector fitter evenly and firmly to minimize breakage under conditions of car vibration. The "angle of shading" of a light source by means of an open-type reflector depends chiefly on the location of the lamp filament with respect to the lower edge of the reflector. From general observations many of the reflectors now used in such installations are of inadequate length properly to shield the light sources from the eye of passengers, or are held in fitters with improper lamp positions. It was recommended that open-type reflectors be selected with sufficient length to provide at least 20 deg. "angle of shading" when the light sources are located 7 ft. or less above the floor.

The bowl for dome fixtures employed for center mounting is usually 12 in. in diameter and is ordinarily used with a lamp or lamps not exceeding 150 watts. A greater value of wattage in this size bowl would result in a unit having excessive brightness. With the relatively low mounting height available in the electric railway car, the use of a shallow bowl will usually improve the general appearance and proportion of the installation.

Five typical car plans were presented to illustrate different lighting designs to obtain an illumination intensity of 6 foot-candles on the 45-deg. reading plane in each installation.

The requirements of intensity and distribution in lighting the seating compartments of cars can be met by employing any one of the following systems:

System No. 1. Center lighting with two 56-watt Mazda lamps or a 100-watt, 32-volt lamp, equipped with a shallow reflector recessed in the ceiling and covered by an inclosing bowl of medium or light density white glass.

System No. 2. Center lighting with a 56-watt Mazda lamp or a 50-watt, 32-volt lamp, in a medium density diffusing glass reflector of the open type.

System No. 3. Side lighting with a 36-watt Mazda lamp in a medium density diffusing glass reflector of the open type.

System No. 4. Side lighting with bare 36-watt Mazda lamps.

The report was signed by A. L. Broe, W. W. Brown, H. F. Deninger, J. P. Staples, H. A. Otis, and R. W. Cost, chairman.

Roller Journal Bearings

THROUGH a questionnaire the committee attempted to secure information setting forth results of test applications of roller bearings to car journals. The data submitted showed wide variation of results and in many cases information submitted was very meager. Quite a few experimental installations have been made in recent months and a large number of railway companies are now conducting extensive tests, the results of which are not available at this time. All electric railways now operating cars equipped with roller bearing journals are urged to keep careful record of performance, tests, etc., for the information of the committee. It was not thought advisable to present a summary of data now available, as this

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might lead to premature and incorrect conclusions. It is hoped that next year the committee may be in a position to present a complete report, together with some constructive recommendations.

The report was signed by H. A. Allen, V. N. DeLamater, E. M. Lunda, K. W. McPherson, J. S. McWhirter, O. F. Packer, W. C. Sanders, W. C. Wheeler and W. C. Bolt, chairman.

Lubrication

FIFTEEN electric railway companies, three manufacturers of truck and motor equipment and two oil companies active in the lubrication of electric railway equipment were sent a questionnaire on the subject of lubrication.

Answers were received from thirteen electric railway companies, two manufacturers of truck and motor equipment and two oil companies. A summary of these replies was prepared as Appendix C of the report. It indicates general satisfaction with the present method of gear lubrication and shows that no specific standard has been adopted. Local conditions, size of the motors used and the kind of service appear to be the factors deciding the particular method used. The committee is of the opinion that this subject is one which requires constant discussion and the spread of propaganda to develop a greater interest in one of the most vital necessities in the care and maintenance of electric railway equipment.

It recommends that the following paragraph be added between the second and third paragraphs of the fourth article headed "Interurban or High Speed Service" on page 2 of Manual Section E208-26:

"It is recommended that lubricant be applied with the gears moving."

The report was signed by L. W. Jacques, Joseph F. Lamb, J. H. Lucas, A. A. Green, W. G. Stuck, chairman.

Noise Reduction

WORK of the committee for the current year started with the revamping of its noise-measuring apparatus, making it more rugged and at the same time adaptable to graphic recording. The second phase of the work consisted of completing the testing of railway gears for sound value, establishing the fact that the most quiet gear is the helical type with the long and short addendum spur, that the standard spur gear follows closely, and that the so-called wisdom tooth pinion produces the most noise. The third concerns the increase of noise due to spread gear centers. Upon the basis of the committee's tests it is recommended that $\frac{1}{8}$ in. be the maximum allowable spread of gear centers.

Another part of the report deals with the economic value of noise reduction, showing the results in life obtained from various amounts of wear of axle bearings and demonstrating the benefit to be obtained from closed original fits and the fallacy of allowing bearings to run almost to the point of destruction.

Tests made at Springfield, Mass., on newly developed car bodies and trucks to establish their noise-reducing value are discussed in the report. The trucks tested are of the automotive type. The tests prove that noise may be much reduced if sufficient precaution is taken.

In another part of the report appears a discussion of the noise of air compressors and mechanically operated doors. Tests show the possibility of the reduction of air compressor noise by about 76 per cent and calls attention to the need of improvement in mechanism and the maintenance of door equipment.

Resilient wheel development is also discussed. Following this is the recommendation that muffling pads be bolted to wheels and gears to help reduce the high-pitched tones emanating from them.

Two appendices of this report describe the noise-measuring device and give a bibliography of the study of noise.

The report was signed by C. Bethel, N. R. Brownyer, C. A. Burleson, L. J. Davies, C. J. Ellis, F. L. Hinman, T. H. Minary, Robert M. O'Brien, H. L. Rogers and H. S. Williams, chairman.

Journal Boxes

INVESTIGATIONS indicated that it is difficult to keep the present journal thrust plates in their proper location due to the tendency of the revolving journal to raise one end of the plate. In addition the retainers for the plates in the journal boxes interfere with the proper packing of waste at the sides of the journal.

As there is no certainty that the thrust plates will remain in position and function as originally intended, it will simplify construction to omit them, thereby permitting the elimination of the retainers in the journal box and allowing the waste to be packed properly around the journal.

The committee recommended (1) That the present standards for journal thrust plates shown on pages 466 to 468 inclusive of the 1926 edition of the Engineering Manual (Manual Section E2-26) be withdrawn; (2) that the retainers for the thrust plates now included in the standard designs for journal boxes shown on pages 459 to 463 inclusive of the 1926 edition of the Engineering Manual (Manual Section E2-26) be removed from these designs; (3) that any electric railway desiring to follow steam road practice in regard to journal boxes, contained parts and axles should use the American Railway Association's Standards and Recommended Practices shown in the 1926 A.R.A. Manual, Mechanical Division; (4) that the A.R.A. Standards listed under Recommendation 3 be indexed in the Engineering Manual, giving the sections and pages in the A.R.A. Manual of Standards and Recommended Practices, issue of 1926.

The report was signed by J. D. Barnhart, C. J. Ellis, T. W. Faber, E. P. Locke, Leslie W. Richards, G. A. Tupper, C. H. Turner, H. Savage and W. S. Adams, chairman.

Limits of Wear

LIMITS of wear of the parts affecting gear centers may be divided into two classes.

1. Those parts where clearance is necessary and where wear is unavoidable, such as axle lining fit on the axle and the armature lining fit on the shaft. In these cases more attention to lubrication and closer inspection will result in less wear and the limits can be maintained by comparatively easy repairs.

2. Those parts where clearance is undesirable and wear is avoidable, such as armature bearing housing fit in frame, axle cap fit on frame, axle lining fit in housing, armature bearing fit in housing. Frequent inspection and tightening of bolts will prevent wear at these places.

There seems to have been no universal practice regarding limits of wear affecting gear centers. Some operators, while maintaining very close limits in some parts of their motors, are inclined to disregard entirely other parts of equal or even greater importance. It is thought that by definite recommendations regarding all of these parts attention may be called to the necessity of maintaining limits on all parts affected, resulting in much better operating conditions and longer life of equipment.

The committee reached the following conclusions regarding limits of wear of parts affecting gear centers.

1. Armature bearing housing fit in frame. This is a driving fit as manufactured and no clearance should be allowed in operation.

2. Axle cap fit on frame. This is a driving fit as manufactured and no clearance should be allowed in operation.

3. Axle lining fit in housing. This is a clamping fit as manufactured and no clearance should be allowed in operation.

4. Armature lining fit in housing. This is a press fit as manufactured and no clearance should be allowed in operation.

5. Axle lining fit on axle. New motors are manufactured with a clearance of 0.015 to 0.020 in. between the bore of the lining and the diameter of the axle. The maximum allowable clearance for motors under 50 hp. should be $\frac{1}{8}$ in. in diameter between the axle and the bore of the lining. The maximum allowable clearance on motors over 50 hp. power should be $\frac{1}{8}$ in. in diameter between the axle and the bore of the lining.

6. Armature lining fit on shaft. New motors are manufactured with a clearance of 0.006 to 0.013 in. between the bore of the lining and the diameter of the shaft. The maximum allowable clearance for motors under 50 hp. should be $\frac{3}{64}$ in. in diameter between the shaft and the bore of the linings. Maximum allowable clearance for motors over 50 hp. should be $\frac{1}{8}$ in. in diameter between the shaft and the bore of the lining.

The committee recommends that its conclusions be adopted by the standing committee on rolling stock as recommended practice for operators.

The report was signed by C. Bethel, F. L. Hinman, J. H. Lucas, W. R. McRae, D. F. Smith and J. M. Bosenbury, chairman.

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T.&T. Committees Present Experiences

Reports on bus operation, traffic and safety and service betterment outline methods followed and results obtained on many properties. Few definite recommendations are made. Bonus and award report presented at joint session with Claims Association

SUGGESTIONS rather than recommendations were the gist of the reports presented this year by committees of the Transportation and Traffic Association. On account of the broad subjects chosen, bus operation, traffic and safety and service betterment, it was thought desirable to refrain from specific recommendations and confine the reports largely to experience statements. Abstracts of these reports are given below.

J. V. Sullivan

Bus Operation

EFFORTS of the committee have been devoted almost exclusively to the attempt to learn from the industry itself such lessons as might be helpful and whatever conclusions it has reached were developed from the experience of railway companies operating buses. In order to get a comprehensive cross-section of the industry the committee selected 55 of the large bus operations by electric railway companies where buses were operated in conjunction with their railway systems, including not only the larger cities but also smaller systems where they were typical of their localities or states. Fifty-two surveys of bus operations were received. These surveys were further checked against the operating data furnished headquarters by more than one hundred companies, and in some instances were supplemented by the committee's inspections. The committee sought the opinion as well as the experience of the industry and consequently has not attempted a summary of figures but rather a report

R. N. Graham

of what is being done universally, the trends throughout the country, if there be such, and finally, the composite thought of the industry where averages could be struck.

After completing this survey the subjects presented for particular consideration seemed to divide themselves naturally under four heads as follows:

1. General economics of bus operation.
2. Types and sizes of equipment.
3. Fares and fare collections.
4. Operating rules.

The fifty-two companies who replied to the questionnaire own 3,084 buses or nearly half the 7,000 buses owned by the electric railway industry and operate 563 bus routes over a route mileage of 6,731 miles divided as follows:

Kind of service	*No. of routes*	*Miles of routes*
Urban	332	1,416
Suburban	103	573
Interurban	128	4,742

About 80 per cent of these companies were quite certain their bus operations were justified. This positive answer was given by men who were experienced in the transportation business and were entirely familiar with their local situations, and can probably be accepted without any question, but apparently few, if any of them, had studied the facts sufficiently to definitely place an approximate value on the use of the bus for this service.

It is the conclusion of the committee that electric railway companies have a surprising lack of knowledge of the economics of transportation.

Of the total of 3,084 buses owned by the companies reporting 35.4 per cent were of 29-passenger capacity, 16.6 per cent were 21-passenger, 15.2 per cent were double-deck and the remainder, amounting to 38.8 per cent, were of various capacities, probably mostly 25-passenger. The trend to the use of the larger single-deck vehicle seems to be pronounced throughout the industry. As a general rule no change is made in the size of vehicle operated at different periods of the day, because usually the trouble and cost of making the change would wipe out any economies that might result from the operation of a smaller vehicle during the time of lighter traffic.

One interesting point brought out was the rather low results in passengers per bus mile prevailing on many routes. Under urban operations the maximum number of passengers per bus mile carried was 17.3; the minimum 0.37 and the average for 40 companies operating such service, 3.75. On many of the routes showing a low passengers per bus mile a large size vehicle is being used. In several cases with the passengers per bus mile below this average double-deck buses were being operated. Of course there may be conditions that make it desirable or necessary to use a large vehicle for light traffic, but there is an indication from the replies to this question that more study should be given to the subject of the application of the proper size vehicle, and that economies might be realized by using a smaller and therefore cheaper vehicle under some conditions.

Under the suburban operations the maximum number of passengers per bus mile carried was 4.31; the minimum, .040; and the average for 7 companies operating such service was 2.25. Under interurban operations the maximum was 12.0; the minimum, .21; and the average for 11 companies operating such service was .268.

In addition to selecting the proper size of equipment to fit the service to be given it is necessary also to use judgment in determining the type of equipment. For general purposes, buses can be classified in three types.

(a) Double-deck buses.
(b) Single-deck pay-enter buses.
(c) Single-deck de luxe coaches.

The kinds of service for which buses are now being used by transportation companies might be divided into four classes:

1. Supplementary to electric railway operation.

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2. Combination with electric railway service for local and express service.
3. De luxe or special route service.
4. Charter and touring service.

Practically one-half the operating companies canvassed have selected certain types of equipment which they deem of best economy to use and use them generally in their service. After carefully analyzing the figures on operating expenses of sizes and makes of buses submitted by these companies, this committee is of the opinion that experience in bus operation is still too brief for accurate observation as to differentials in cost between them.

Twenty companies of the 52 answering the questionnaire have also furnished to the association a complete record of their revenue and expenses for the year 1926. Seven of these twenty companies, or 35 per cent, had operating revenue sufficient to pay a return on the investment after meeting operating expenses, taxes and depreciation. Five of this group of seven companies were charging higher fares than were charged on associated railway lines. Of the thirteen companies which did not have any income available for a return on the investment, only six were using a higher fare than associated railway lines. Two companies, or one-tenth of this group, have been able to pay some return on the capital invested and keep their bus fares on the same level as railway fares.

Twenty-six of the 52 companies anwering the questionnaire have higher fares for bus service than for car service. Fifteen of the remaining 26 which use a similar fare for both charge higher rates for certain bus service. This leaves only eleven of the 52, or about one-fifth, operating bus and rail service at a universal fare.

In contrast to the actual relation of bus and rail fares, forty-five of the fifty-two operators say the bus fares must of necessity be the higher, the opinions ranging from "slightly" to "two and one-half times." Five operators are of the opinion that bus fares and rail fares should be the same. Two were unable to answer. Guided by experience, an everwhelming proportion of the industry believes that bus fares should not be the same as rail fares. Answers to the question regarding the proper method for determining bus fares shows conclusively that the operators believe the service should be self-supporting.

Supplementary service is usually operated under the name of and co-ordinated with street railway service. Street railway fares and interchange of transfers frequently obtain. In any case, the service rendered is comparable with that given by the street railways and the fare is not materially higher.

De luxe city service in some instances parallels railway operations. The equipment used should be more elaborate and a higher rate of fare is charged than in regular service. Intercity service is distinct from the two classes previously described in that the length of route is considerably longer. Fares are usually based on a zone or mileage plan. Chartered service may be either of local or interurban city type and the rates are ordinarily based on the length of trip or time consumed rather than on the number of passengers carried.

Extensions to present lines and new routes into unserved territory are now being made very largely by the use of the bus. With this new type of equipment, there is the opportunity of making trial installations of the service with a fare structure entirely divorced from the basic franchise limitations on the general transportation system.

It is evident to the committee that the transportation facilities cannot be increased unless the people served and the municipal authorities can be convinced of the necessity of supplying sufficient revenue to provide a reasonable rate of return on the capital invested. In some cases this should be secured through a higher fare on the extension, adequate to cover the cost of the new undertaking. In other cases the general fare must be sufficient to supply the surplus for the purpose of covering the losses on such extensions.

Rules for the guidance of bus operators are given in an appendix.

The report was signed by J. L. Alexander, H. L. Bollum, C. H. Chapman, C. B. Cooke, Jr., E. D. Dreyfus, D. L. Fennell, S. W. Greenland, M. L. Harry, R. B. Hill, Adrian Hughes, Jr., Daniel S. Mackay, H. G. Monger, Thomas W. Noonan, E. S. Pardoe, D. A. Scanlon, Alexander Shapiro, D. A. Smith, J. L. Smith, A. T. Warner, C. V. Wood, Jr., B. W. Arnold, vice-chairman; R. N. Graham, chairman; A. R. Myers, sponsor, and Paul E. Wilson, sponsor.

Traffic and Safety

RELIEF of street traffic congestion is the subject to which the committee has devoted most attention. The report states that there has been a well-directed tendency during the past few years toward comprehensive street traffic surveys in a number of cities. The opportunity to reduce operating costs, increase revenue and build a better position in the community should induce railway operators to align themselves with this movement for street traffic relief. Street railway operators not only can render much assistance in the collection of data on practices which increase congestion, and through study of efficient methods of traffic control can assist in drafting relief measures, but these operators are often best qualified to take charge of this traffic survey. Street railway executives should be known for leadership. This leadership will not be misdirected if applied to investigations to obtain a more equitable and more efficient use of public property.

H. K. Bennett

Signal control and traffic restrictions should be considered together in relief of traffic congestion. As mechanical signal control can reduce delay by giving the proper time intervals at the intersection, so also can enforced traffic restrictions reduce congestion by opening to use the full street width and taking advantage of this time and space by reducing conflicting movements to a minimum.

C. H. Evenson

Street traffic congestion may be regarded as composed of two factors: First, movement of traffic, and second, temporary storage of vehicles on streets. A comprehensive system of traffic regulations must give consideration to these two types of street use.

Too often at intersections an unsuccessful search is made for traffic signal timings to handle the heavy interesting movements, while parking, which reduces by half in many instances the number of moving lanes, is unrestricted. Intersections are throats which limit traffic flow. At intersections of heavy traffic streets, where time must be divided between two or more movements, the full width of street should be made available. Parking restrictions near intersections, both in principal business districts and outlying business sections should extend at least 100 ft. back from the curb corners. If this distance is shorter, the few vehicles which can accumulate in the extra lanes will not require the full movement to clear the intersection. Thus to obtain the best use of such reservoir capacity at isolated intersections the restricted space should be sufficiently long to accumulate during the "Stop" period a line of vehicles which will require nearly the full movement to clear the intersection.

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Closely allied to parking restrictions as a means of obtaining more effective street use is the desirable restriction of unimportant or necessary movements, particularly at intersections. Movements which must give way to permit faster speed, less conflict, more effective street use and fewer accidents are chiefly left turns at some intersections and "U" turns on congested streets. We shall also probably see more restriction of the right turn privilege where heavy pedestrian traffic must be accommodated. Such conflicting movements can well be transferred to adjacent or near-by intersections where the conditions will permit the movements without appreciable interference to traffic. This change need not inconvenience the driver whose movement at the busiest intersection is restricted. He can plan his turns accordingly and the time saving and increased freedom of street travel will be very marked.

As effective means of reducing traffic congestion, the committee recommends:

1. A comprehensive traffic survey to gather facts on present street use and recommend methods of using street facilities to their fullest extent.

2. Traffic studies to precede installation of mechanical signal control. These observations and data should determine first the desirability of signal installation and, when signal control is justified, further study to determine the proper timing.

3. That signal-controlled intersections less than 1,000 ft. apart should be operated wherever possible as a system after proper studies are made to determine settings which will give a progressive movement through such intersections.

4. Elimination of parking on busy thoroughfares as one of the most effective means of increasing the usefulness of the streets.

5. Restrictions against left turns at important intersections and prohibition of "U" turns in mid-block, when the delay and accident hazard which results more than offsets the convenience offered by this flexibility.

The subjects of standard classification of accidents and separation of accidents into "chargeable" and "non-chargeable" groups were also considered by this committee. A summary of recommendations of the recent Chicago street traffic survey is included as an appendix to the report. It was believed that this might prove useful in other cities contemplating similar surveys.

For the T. and T. Association the report was signed by A. W. Brohman, F. L. Butler, Ralph W. Emerson, Arthur Gaboury, J. P. Ingle, Richard Meriwether, J. A. Miller, Jr., W. R. Power, E. S. Rider, E. C. Spring, J. A. Stoll, A. J. Fink, vice-chairman; C. H. Evenson, co-chairman; W. H. Boyce, sponsor, and Samuel Riddle, sponsor. For the Claims Association the report was signed by Seth W. Baldwin, Neil W. Funk, George H. Ingles, A. G. Jack, Trevor C. Neilson, Victor T. Noonan, Edwin J. Paige, John J. Reynolds, J. J. Sharkey, Russell A. Sears, sponsor, and H. K. Bennett, co-chairman.

Bonus and Award Systems

BETWEEN 40 and 50 properties are using different forms of bonus and award for the reduction of accidents. It is not only the smaller companies that are included in the list. Two companies which recently have put a bonus system into use are the Brooklyn City Railroad and the Public Service Railway of New Jersey. Bonus systems are also in effect in Birmingham, Denver, Los Angeles, Milwaukee, Nashville, St. Louis and Washington.

It may be that the adoption of such a plan at a time when accidents already are at a minimum without it would constitute a mistake in judgment. A company in such a situation would be interested in bonus and award only as a plan for a possible future activity when other methods for preventing accidents had been exhausted and the company was beset by mounting accident figures. Safety work is inspirational in character, and from time to time new methods must be introduced.

G. T. Hellmuth

Objection has been made to the giving of a bonus on two grounds: (1) that the number of unreported accidents will be increased and (2) that it is wrong in principle to pay again for what should be given in return for the day's wages—viz., careful and safe operation.

As to the first objection, letters from users of the plan indicate that with the proper system unreported accidents will be decreased. As to the second objection, it is well known that a reward given for work particularly well done is a sound business proposition. The idea is not confined to railway operation.

The Brooklyn City Railroad put a bonus plan into effect on Aug. 1, 1926, and no changes have been made in the original plan since that time. The first awards under this bonus plan were made on Dec. 15, 1926, at which time $20,770 was paid to 1,876 conductors and motormen. This was an average of $11.05 per man and 86.4 per cent of the conductors and motormen participated. During the current bonus year and as of June 30, 1927, conductors and motormen had earned a total bonus of $47,365. With deductions for men leaving the service, it is estimated that the cost of the bonus for the year ending Nov. 30, 1927, will be approximately $60,000.

For eleven months ended June 30, 1927, accidents on this system have decreased 11.5 per cent, and the severity of the accident has been greatly diminished; 62.4 per cent of all accidents are car and vehicle collisions. Conductors and motormen could have prevented and therefore are found to be at fault for 40.5 per cent of all accidents. "Blind" accidents have decreased 32.4 per cent during the eleven months of the bonus as compared with the same period of the previous year.

The bonus plan of Public Service Railway was put into effect Dec. 3, 1926. For the first five months of the year there was a falling off of 4.54 per cent in accidents per million passengers carried.

In 1918 organized accident prevention work was begun by the Tennessee Electric Power Company and has been continuously carried on ever since. For the ten years preceding 1918 the average cost of the claims department was 12 per cent of the gross passenger revenue earned. For the years 1919 to 1926 inclusive the cost has been 4.78 per cent.

Since this property inaugurated the bonus plan in connection with accident prevention work, it has been able to reduce its pull-ins from 350 to 49 per month, and its equipment is old and hard to keep up.

Details are given concerning the methods of giving bonus and awards by the companies mentioned and also those of the Milwaukee Electric Railway & Light Company, and the Los Angeles Railway.

The report was signed by B. D. Haskins, A. W. Kohler and G. T. Hellmuth, chairman.

TABLE SHOWING ACCIDENT AND CLAIM RECORDS OF TENNESSEE ELECTRIC POWER COMPANY RAILWAY DEPARTMENT

	Total No.	Accidents—Collisions with Motor Vehicles	Accidents—Collisions with Cars	Claims	Gross	Per Cent Claims to Gross
1917	2,291	.....	..	$120,010	$672,646	17.8
1918	2,793	.....	..	152,604	860,275	17.7
1919	2,182	.....	..	66,356	857,372	7.7
1920	2,456	2,436	83	77,205	1,084,653	7.1
1921	1,753	2,132	60	42,050	978,202	4.3
1922	1,634	432	19	39,161	958,132	4.09
1923	1,846	571	23	55,311	970,889	5.69
1924	1,300	515	22	59,885	1,589,418	3.76
1925	1,649	654	23	28,398	1,675,270	1.69
1926	1,583	691	52	58,733	1,735,843	3.38

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Service Betterment

It was felt by the committee that the subject of service betterment divides itself naturally into two main topics:

1. Increasing speed.
2. Providing greater comfort and convenience.

The first main topic was further subdivided into two headings:

(*a*) Increasing speed in congested districts.

(*b*) Increasing speed in outlying districts.

The second main topic was subdivided into two headings also:

(*a*) Increasing the comfort of the car itself.

(*b*) Increasing the convenience of the service.

The committee suggested the adoption of a modified plan of selected stop operation, where conditions do not admit of complete stop selection. Under this plan, all stops would be available to riders for the greater portion of the day, but on the peak trips, when headways are more frequent, riding is heavier and speeds are ordinarily slower, alternate stops would not be made. These points should be designated by special pole symbols and neat metal signs setting forth clearly the hours when cars do not make the stops.

The committee urged member companies to give the matters of running time and layover time renewed study and careful analysis, with the view of obtaining the highest speeds consistent with good operation. It also emphasized the importance of selecting proper motors and gear ratios for any given service, the importance, from the speed standpoint alone, of so maintaining the brake equipment that stops can be made in the minimum distance consistent with passenger comfort.

A number of companies have devised ways of increasing surface car speeds by the operation of express cars or buses.

The most usual type of express service is where there are two parallel car lines or a bus line paralleling a car line. The committee felt that it is preferable for the street car line to take care of the long-haul business and operate as an express line, leaving the bus line a shorter route handling local business. Another type of express service which has worked out successfully in city service is the usual steam railroad or interurban railroad plan of operating expresses and locals on the same tracks. This can be done by careful scheduling and judicious selection of the "express" territory when headways are not too close and when a fairly infrequent local car headway can be given. The committee offered the sugestion that cars may be speeded up by the substitution of air whistles, electric horns or other modern warning signals for the present type of foot gong.

Special attention was given to the relationship of contact and convenience and attractiveness of service. Many problems in the sale of service have been caused by lack of contact with the customer, the salesman and the field in which transportation is sold. It is believed that partial ignorance of exact conditions has created confusion on the part of managements in attempting to decide upon and maintain a policy which would bring about a convenient and attractive service or the proper co-ordination of bus and street car service.

Dependent on the density of population, there is need for two or more classes of service. Speed and comfort are factors in determining the need for express lines which may co-ordinate with slower urban electric railway operation. Street railway companies, however, are cautioned against making promiscuous substitutions of bus lines for rail lines. It is easy to be over-optimistic as to increased receipts from bus operation, and one cannot be too

S. E. Emmons

conservative in figuring bus operating costs. Furthermore, railway overheads continue after the abandonment of a branch line, and the railway operating expenses may not be decreased by the amount estimated. Then, too, when a railway line is abandoned, there is a loss of valuation, upon which a rate of return is figured, which probably will not be replaced by anything approaching an equivalent figure from the bus operation. Very often what appears at first glance to be a proper case for rail abandonment and the substitution of buses resolves itself into a clear-cut proposition for rehabilitation of the rail service, when all factors are given proper weight.

Most companies own several classes of passenger equipment, and a preference is shown by the riders for certain classes. A management should make every effort to increase the use of the preferred equipment and to cut down the use of less popular equipment.

On one property this matter was given careful study, and it was found possible to increase the average number of miles per day for the good cars from 80 to 90 miles, with the result that three unpopular classes of equipment totaling 134 cars were retired completely and 42 other cars were retired from regular service. The change resulted in giving the riders much better car service, gaining good will, building up receipts and reducing operating expenses —an extremely profitable undertaking all around.

Good housekeeping is a comparatively inexpensive form of maintenance, yet the return in added attractiveness is large for the small investment. A reputation for having clean cars and buses, immaculate car houses and waiting rooms, well policed right-of-way, etc., will bring forth a very favorable public reaction and will go far toward the creation of an appearance of prosperity which will inspire confidence in the road and its management. Car painting is one of the last things to neglect, purely aside from the fact that depreciation of car bodies increases rapidly when painting is skimped, for not even the best of service can be really attractive if it is supplied with dingy, faded, unprosperous looking vehicles.

Much can still be done toward noise reduction. Noise elimination should be considered from two angles: noises inside the car and those reaching persons not riding in the car. The first presents the easier problem. This solution is more in the nature of noise exclusion and is effected by floor coverings, insulated linings, window weather-stripping, roof head-lining, etc. The second, or exterior, class of noise is much more difficult to overcome. It has to deal primarily with the amount of unsprung weight, class of brake rigging, gearing and condition of rail. Recent experiments in spring suspended motors, worm gear drive, etc., should be watched with the keenest interest.

In recent years the industry has added to the comfort of its patrons by giving them more comfortable seats. Longitudinal seats have been replaced almost entirely by transverse seats, except around loading areas, but there is still improper seat spacing. In the judgment of the committee it is more desirable to have a somewhat smaller number of passengers comfortably seated than to provide the few additional seats to the discomfort of all seated passengers.

New cars, in most cases, should be designed for some form of modern luxurious, deep-cushioned seats. The report warns against the assumption that because an industrial class of people are to be served good seats are not warranted. Experience has shown in a number of cases that these are the very people who can be induced to ride more frequently through the medium of more comfortable service. It is generally found that luxurious seats have a strong appeal to all classes of riders.

The most prominent things on the streets of most cities are the street cars, and a favorable or unfavorable opinion of a city may be gained subconsciously through the exterior appearance of these cars. The same is true of buses.

The report was signed by Walter H. Burke, F. J. Denney, John A. Dewhurst, W. J. Flickinger, J. A. Greig, A. L. Hedges, R. H. Horton, E. A. Palmer, A. E. Potter, J. P. Potter, A. C. Spurr, J. B. Stewart, Jr., J. C. Thirlwall, W. E. Thompson, C. D. Smith, vice-chairman, S. E. Emmons, chairman, G. B. Anderson, sponsor, and Edward Dana, sponsor.

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News of the Industry

Hearing on Madison Fares Under Way

A hearing on the petition of the Madison Railway, Madison, Wis., for a 10-cent fare was started before the Wisconsin Railroad Commission on Sept. 27. An agreement has been reached between the city and the company whereby the city will repair the track zones on ten streets at a cost not to exceed $7,500. The company will reimburse the city at a rate of $500 a month. Gross revenue received by the company for August was practically the same as that of August, 1926. The gross revenue was $30,342, compared with $30,401 for a similar month last year.

Superior Company Claims Fare Insufficient

The Duluth Street Railway, operating in Duluth, Minn., and Superior, Wis., at a hearing before the Wisconsin Railroad Commission asked for the establishment of a new fare rate base in Superior, Wis. The company set forth a valuation of $1,225,000. It submitted figures showing that earnings have decreased and asserted that the present cash fare of 10 cents and five tickets for 30 cents were insufficient.

Transport Offer for Long Beach, Cal.

A unified system of rail-bus transportation was offered to the City Council of Long Beach, Cal., in a comprehensive plan worked out by the Pacific Electric Railway. Conceding a point insisted upon by City Manager Callahan and former City Manager Henderson, the company asks for a 7 per cent guaranteed return instead of an 8 per cent one. The recent offer is a revision of the program submitted on Dec. 7, 1926. The important provisons include the following:

Valuation of the Long Beach system by the Railroad Commission to establish a rate base; a fare of 10 cents on all street car and bus lines within the City of Long Beach, tickets to be sold at the rate of eight for 50 cents good within the city of Long Beach, except that they will not be honored north of San Antonio Drive; a 3⅓-cent fare for school children by purchase of books of 30 tickets for $1, not honored north of San Antonio Drive; stipulation that there will be no change in the fare for two years and after that raising or lowering it according to whether the return is more or less than 7 per cent; the placing in service of a minimum of 50 modern pneumatic-tired buses; a 35-year car franchise and a ten-year bus franchise; extension of rail lines and a network of bus lines; municipal acquisition of the system at any time and payment to the city of 2 per cent of the gross receipts of the system.

D. W. Pontius, general manager of the Pacific Electric Railway, stated that if the offer were accepted a large amount of additional capital would be necessary and it was understood that the offer would have to win the approval of the board of directors of the company. In making this offer the company proposed to buy the B. & H. Transportation Company and asked cancellation of revocable permits under which the West Side Transit Company ran buses.

Smith Report Published

Suggests fare increase with unified system for New York City and attacks waste of city-owned lines. Buses essential as feeders

TWELVE recommendations are made in the report of Charles Edward Smith, noted transit expert, called in by the city of New York to make a survey and analysis of its traction problem. Although not released by Comptroller Berry, the report was published by several of the New York newspapers.

An outstanding suggestion is given as the substitution of a flexible fare, starting at 7 cents, with four rides for 25 cents, in place of the existing 5-cent rate. Other recommendations are issuance of transfers at all points, without the payment of any extra fare; adjustment of the fixed guarantees of the elevated and Interborough lines in Manhattan; reduction of the Manhattan elevated interest rate from 7 per cent to 5 per cent; cancellation of present deficits to re-establish credits; pooling of net revenues; lowering of the city's rate of interest on its investment from 8.76 per cent to the present sinking fund rate; control of surpluses by the city and the transportation companies; appointment of a board of control to fix fares, operating allowances and other rates, this board to consist of the comptroller, Chairman of the Transit Commission and a representative of the transportation companies; a division of the surpluses, one-half to the surplus fund, one-quarter to the transportation company and one quarter to personnel; issuance of city bonds for construction, and an agreement by the cities and the transportation companies to obtain enabling state legislation.

To the war he ascribes the financial and service troubles of all the transit companies in recent years. The rapid transit systems in New York he termed a "miracle of modern science" which should be "co-ordinated into a unified system at always self-supporting fares with free transfers." Mr. Smith finds a fixed 5-cent fare unworkable.

Among the revelations in the report is the statement that the new city subway system is going to cost $140,000,000 more than the official estimate, bringing the total to $842,000,000 and that even then the city will not have the needed coverage of territory. He added that the old Transit Commission's plans, which provide for extension and amplification of the existing lines and do not include city-owned new lines, could be achieved for $300,000,000 and would accomplish approximately the same purpose with a saving of $500,000,000. City officials were condemned for not giving relief to the transit companies in 1918 for through lack of revenue, operation has been kept in a stage which while not entirely dangerous could not be called definitely safe.

He finds that over a period of nine years the cost of carrying a passenger on the Interborough Rapid Transit Company (from 1919 to 1927) averaged 6.143 cents and adds "this fare on the Manhattan elevated and surface lines will secure improved service and relieve the companies from unfair financial troubles." This would be an increase of only 25 per cent and would correspond to a 4-cent fare before the war.

Mr. Smith considers buses essential to any well-integrated city, not taking the place of but rather supplementing the service rendered by subways, surface lines and elevated roads. The cost of buses superseding the electric railway he estimated at $25,000,000 to $40,000,000. In crosstown service in narrow congested streets where the lines of traffic are frequently diverted and as feeders to surface and rapid transit lines there is a wide field for buses in New York, he claims. But there is no place for them, he feels, in competition with surface lines because they cripple the service of the surface lines and ultimately stop them without being able to handle all the traffic as well, as economically or as speedily.

At the invitation of the Board of Estimate and at the personal request of Comptroller Berry Mr. Smith arrived from St. Louis last spring to study the transit situation in New York City. The engineer's report consists of approximately 30,000 words. The report will be summarized in a later issue of the ELECTRIC RAILWAY JOURNAL.

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Sunday $1 Ticket Popular in Boston

The Eastern Massachusetts Street Railway, Boston, Mass., has made the Sunday $1 ticket so popular that it is now selling as many as 4,000 for a Sunday. With one of these tickets a passenger can ride all day, as much as he desires, on the Eastern Massachusetts system, back and forth on a single line, or from one end of the system to the other and back. There is no limit. Such riding has become a popular diversion in some sections. The trip one rider took from Fall River meant about nine hours of riding and would have cost about $8 on the regular fare basis.

Vetoes Wilcox Survey—Suggests Report from Specialists

San Francisco's Mayor and Supervisors, at the height of a municipal election campaign, are involved in a bitter controversy over the appointment of Delos F. Wilcox of Grand Rapids, Mich., as an expert to survey the transportation situation in San Francisco. Mr. Wilcox was selected by unanimous vote of the Board of Supervisors and engaged at a salary of $10,000 for two months' work. Mayor James Rolph, Jr., however, refused to approve the appointment.

In a veto message the Mayor openly declared that Mr. Wilcox is "a municipal ownership enthusiast without practical experience in the construction, management and operation of street railways." Supervisors are endeavoring to line up the fourteen votes necessary to override the veto. In the meantime the expert remains on the job.

Mayor Rolph urged in his vote of veto that instead of employing Mr. Wilcox the Supervisors select a board of three to be chosen for outstanding technical ability in the construction, operation and valuation of street railways, as well as franchise matters. He declared that the problem was one that should be studied calmly by a board of experts.

The future of San Francisco's street car operation is rather hazy at the present time. Market Street Railway franchises begin to expire in 1929 and the policy of the city as to the disposition of these franchises is still undetermined. Ardent municipal ownership advocates are in favor of the city taking over the lines of the Market Street Railway as the franchises expire and thus augmenting the municipal railway system. Others, however, who are against this policy, advocate the continuance of two competing railway systems. As yet no constructive future policy has been evolved. It was to study the situation that Mr. Wilcox was employed.

In part Mayor Rolph said:

What is required is not a further discussion of a principle already settled, but a practical demonstration by the best experts of how the physical and legal problems confronting the city can be solved. The legal problems can be disposed of by the city attorney. The physical problems should be clarified by engineering experts of the greatest skill and experience. A plan outlined by a board of this character would receive the confidence and support of the people. I therefore recommend to your honorable board that you provide for such a board of experts.

Storm Hits St. Louis Utilities

Railways and Bus Companies Unite in Disaster to Carry Stunned Passengers—United Railways Suffers Heaviest Loss, Amounting to $250,000—Service Resumed on All Lines

WHEN the tornado which killed 89 persons, injured 1,200 others and did property damage estimated at $15,000,000 to $50,000,000 in St. Louis, Mo., and Venice, Madison and Granite City, Ill., on Sept. 29 had passed into history the United Railways, St. Louis; the Illinois Traction System, the St. Louis, Alton & Granite City, the East St. Louis & Suburban Railway companies and the People's Motorbus Company found that several of their main lines had been put out of commission.

The United Railways, St. Louis, suffered a loss of $250,000, an estimate set Oct. 2 by Col. A. T. Perkins, general manager for Receiver Rolla Wells. The loss does not take into consideration passenger revenue due to the storm. For a time all the major lines of the city leading into North St. Louis were put out of commission. Right after the terrible storm struck it was believed the loss to the company would be $600,000 or more.

Two of the company's carhouses were badly wrecked and sheds were damaged to the extent of about $150,000. Damage to the street cars totaled about $75,000. Eight cars housed in the carhouse at Spring Avenue and North Market Street are a total loss, while 200 other cars were damaged. The injury to overhead wires and cables will be about $35,000, Col. Perkins estimated.

Within twelve hours the United Railways emergency forces had restored service on all but seven of the lines affected and by Oct. 1 all lines were in full operation but the Cass division, which has since resumed operation.

When the storm swept through the residential district from Kingshighway and Manchester Avenue northeastwardly several hundred thousand men and women were in the downtown offices and stores and the industrial plants that skirt the Mississippi River. Many were not aware of the extent of the storm until they endeavored to get to their homes. Every street car line leading into North St. Louis was out of service.

Practically two-thirds of the city was without railway facilities and this big load at its very peak period was thrown onto other transportation systems, especially the People's Motorbus Company and the St. Louis Bus Company, the latter a subsidiary of the United Railways.

Many from the People's company's regular forces and extra men were sent into the district swept by the twister to clear away débris, remove overhanging wires and otherwise clear the way for the buses. That company also sent buses to act as ambulances.

Buses of the St. Louis Bus Company proved of the utmost value on Thursday night and throughout Friday in supplementing the handicapped street car lines, while in Illinois a similar service was rendered by buses of the Blue Goose Motorbus Company, subsidiary of the East St. Louis & Suburban Railway, during the ten-hour period in which the trolley lines through the Tri-Cities and to Alton, Ill., were out of service.

Several out-of-town bus lines running into St. Louis also pressed their buses into city service and did what they could to supplement the service of the car company and the People's company.

But while the service cars were getting all that the traffic would bear at a greatly increased tariff the regularly operated main taxicab lines and the bus companies did not raise their rates. However, it was very difficult to get taxicabs from the regular companies, since many were used as ambulances. While the service car operators raised their rates, thousands of owners of private automobiles proved equal to the city's big emergency by carrying other persons to their homes. Crawling slowly out of the downtown district many high-priced five-passenger sedans were carrying a dozen riders.

Thousands of St. Louisians were forced to walk miles to get to their homes, while others unable to walk all the way did not get home until almost midnight. In normal times the street cars carry persons from the main business sections to parts of northeast and southwest St. Louis farthest removed from the downtown section in 50 minutes.

Baltimore Advertises for More Riders

Since being refused an increased emergency fare by the Public Service Commission, the United Railways & Electric Company, Baltimore, Md., has launched an increased advertising campaign. Cars have appeared on the streets with placards calling attention to the cheapness of trolley riding and other advantages of using that means of transportation.

Meanwhile the company is preparing for the hearing before the commission scheduled to open Oct. 26, on its petition for a permanent 10-cent fare. Linwood L. Clark, counsel for the People's Corporation, announced that he would submit a new schedule whereby habitual riders would be given a preferred rate.

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Recent Bus Developments

Fares Cut on Kansas City Bus Line

Bus fares on the Country Club express line during the non-rush period of each weekday were reduced from 25 cents to 19 cents, effective Oct. 1. The reduced rate is in force each weekday between 9 a.m. and 4:30 p.m. and again at 7 o'clock at night. The 25-cent rate will be charged all day on Sundays and holidays.

The purpose of this reduction is to increase the patronage on the express line during the non-rush hours in order to make the line a paying venture, according to Fred G. Buffe, vice-president of the Kansas City Public Service Company.

Tickets at the new rate of slightly less than 20 cents are being sold at the street car dispatchers' stations, scattered over the city at important corners, and at drug stores. They may also be obtained from the public service company's central office by mail.

Bus Territory Expanded in San Diego

The San Diego Electric Railway has recently extended the scope of its bus operations by taking over the Lloyd's El Cajon Stage Line, operating between San Diego, Cal., and El Cajon, and serving intermediate points including La Mesa and Grossmont. Application for certificate of public convenience and necessity was filed with the Railroad Commission by Sutherland's Tia Juana Stages, a competing stage operator, to operate between San Diego and La Mesa, thereby serving territory which is directly in line with extension of the railway system, and it was for this reason that the railway purchased the Lloyd line and also filed counter applications with the commission. After public hearing, all applications for additional service to La Mesa were denied by the Railroad Commission, which, however, ratified the sale of the Lloyd line and advocated increases in schedules to afford adequate facilities. Approximately 16 miles of bus route have been added to the system.

Equitable Grant Termed Illegal

That the bus franchise awarded to the Equitable Coach Company was illegal was the opinion expressed at the hearing by the Transit Commission on Oct. 3 by Clarence J. Shearn, of counsel for the Brooklyn-Manhattan Transit Corporation, and Max D. Steuer, of counsel for the New York Railways Corporation. The contenders attributed the illegality of the bus franchise for Manhattan, Brooklyn and Queens to the failure of Borough Presidents Julius Miller of Manhattan and Henry Bruckner of the Bronx to vote for it in person.

Commissioner Leon G. Godley, who presided, suspended the taking of testimony on the company's application until the next hearing. He said he would then decide on the legal points raised. The point raised by these counsels hinged on whether or not a borough president had the power to delegate his authority and vote in the Board of Estimate to his Commissioner of Public Works.

Buses Accommodate Toledo Students

A number of variations in bus routes operated by the Community Traction Company, Toledo, Ohio, has been made effective recently to accommodate school students. Two of the express lines route one bus each way daily by way of Scott High School, a special bus collects passengers each morning in the north section of the city for Waite High School and the Broadway-Glendale bus has been routed in the opposite direction so that pupils of Harvard School may get off on the side of the River Road nearest the school. These arrangements were made through Superintendent Forsgard and Commissioner E. L. Graumlich.

At the present time 15 per cent of all operation of the traction company is by motor coach as against 9 per cent coach operation a year ago. The company has a fleet of 30 coaches and will soon probably purchase additional equipment.

Buses to Run in Hillsboro

Permission has been granted by the Illinois Commerce Commission to the Illinois Power & Light Company to discontinue railway service in Hillsboro, Ill., and substitute a line of buses. The railway system has been in operation there for twenty years.

Bus Extensions on Clay County Line

A permit to the Kansas City, Clay County & St. Joseph Auto Transit Company, a subsidiary of the Kansas City, Clay County & St. Joseph Railway, to operate stage lines between Kansas City and St. Joseph, Kansas City to Excelsior Springs and Liberty and Kansas City to Parkville, was issued by the Public Service Commission at Jefferson City, Mo., on Sept. 24. The application for and the issuance of a permit to the Kansas City, Clay County & St. Joseph Railway to operate buses was in compliance with the provisions of the new Missouri bus law, which became effective July 3, R. F. Mahan, general superintendent of the company, said. The company started the operation of buses three years ago.

Hearing for Richmond Bus Petition Continued

The Virginia Corporation Commission has continued to Nov. 16 the hearing of the Sandston Railway, Richmond, on its petition for a certificate of public convenience and necessity to operate a passenger bus service co-ordinating with the present electric railway line, which covers approximately 8 miles. The Virginia Electric & Power Company is opposing the granting of the certificate.

Buses in Lincoln Must Load at Street Car Safety Zones

Following several months experiment of permitting the buses operated by the Lincoln Traction Company, Lincoln, Neb., to take on and discharge passengers at curb stations reserved for stops, the City Council has passed an ordinance requiring them to load and unload at the old street car safety zones. Where none of these is now marked off reservations will be made. The ordinance applies only in the congested districts and was found necessary because of the difficulties the old way added to handling traffic. This will affect 21 stops. Buses will be stopped and started on intersection signal, but traffic is permitted to pass to the right of a bus where such bus has come to a stop at a safety zone to take on or discharge passengers.

Continuance of Line in Cincinnati Won

The deluxe coach service on Reading Road, Cincinnati, Ohio, operated by the Cincinnati Street Railway, which was to have been discontinued on Oct 1, will be continued for another month with single fares still at 25 cents, but tickets at five for $1. In response to a questionnaire sent out by the company 79 out of 100 replies expressed satisfaction with the schedule.

Buses Succeed Cars on Pennsylvania Line

The West Penn Railways, Pittsburgh, Pa., announced on Oct. 3 that railway service connecting Oakdale, Noblestown, Sturgeon and McDonald would be abandoned with the last run on Saturday night, Oct. 15.

Bus service operated by Penn Bus Lines will begin at 5:30 a.m., Sunday, Oct. 16. It is planned that 21-passenger, city-type, Yellow coaches will be used in this operation. The same schedule service is offered as that now given by the railway cars.

Wisconsin Interurban Uses Bus

Interurban service between Plymouth and Elkhart Lake has been abandoned by the Wisconsin Power & Light Company, Madison, Wis. Bus service has been substituted. Six trips will be made daily.

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Financial and Corporate

Messrs. Miller and Crosby New Directors at Oakland

Two new directors have been elected to the board of the Key System Transit Company, Oakland, Cal. The new men are Robert W. Miller, a son of C. O. G. Miller, former president of the company, and F. H. Crosby, a representative of J. Barth & Company, brokers, who now control a majority of Key System stock. Mr. Miller replaces John S. Drum, well known San Francisco banker and president of the American Trust Company, who gave the pressure of banking business as the reason for his resignation. Mr. Crosby succeeds Lester S. Ready, former president of the Key System, who resigned that office recently to become vice-chairman of the board of directors and who now has entirely severed connection with the railway.

Reorganization Plans in St. Louis Approved

The Missouri Public Service Commission on Oct. 1 announced at Jefferson City that it had approved the reorganization plans of the United Railways, St. Louis. No finding of value was made in its order, the commission merely stating that on the showing made there was sufficient property of the United Railways to justify the issuance of the securities asked by the St. Louis Public Service Company, which has purchased the railway properties. Approval of the state commission was necessary before the new company could issue its securities under the plan of reorganization.

The funded debt of the new company will include $30,300,000 United Railways first general mortgage 4s due July 1, 1934; $6,000,000 United Railways first general mortgage 4s, due July 1, 1934, held as collateral for $5,000,000 short term loan; $4,500,000 City & Suburban Public Service Company first mortgage 5s, due July 1, 1934. Grand total funded debt $40,800,000, with annual interest charges of $1,677,000. Stock to be issued by the company will include 73,193 shares preferred stock of St. Louis Public Service Company. This stock will bear $7 a share cumulative dividends, or a total annual interest charge of $512,351. Also 343,645 shares of St. Louis Public Service Company non-par common stock.

In its order the commission expressed the opinion that the reorganization plan was complete and had many commendable features, not the least of which were the substantial reductions made in the bonded indebtedness and the amounts of the annual fixed charges. Further, that it could not be doubted that the termination of the receivership and the reorganization of the system would result in benefit both to the public and the owners of the property.

Transportation Revenues on Brooklyn City Lines Increase

For the fiscal year ended June 30, 1927, the Brooklyn City Railroad, Brooklyn, N. Y., reports gross revenues from transportation of $11,460,584, an increase of $61,210 compared with the previous year. Other operating revenue amounted to $191,175, a decrease of $87,366, the decrease being due to the cancellation of the contracts with the Brooklyn-Manhattan Transit Corporation under which it had previously leased certain of the company's car houses, shops and other properties and changes resulting from the sale of the general office building. These facts were disclosed by H. Hobart Porter, president, in the 73d annual report to the stockholders.

Operating expenses were $9,326,056, an increase of $362,952 compared with the previous year. Since 1919 the methods of accounting have generally followed those which were in effect at the termination of the lease. Much consideration has been given to this subject, and as of July 1, 1926, radical changes in the accounting methods, particularly the methods of accruing the reserves for replacement of way and structures and equipment, were adopted, with the approval of the directors, so that the charges for maintenance as between 1927 and 1926, shown in the income statement, are not comparable. The cost of power shows an increase for the year of nearly $72,000 compared with 1926. The Brooklyn City Railroad purchases its power, under a long term contract, from the Brooklyn-Manhattan Transit Corporation, the price being based on the actual cost of the power to such company. In the past year large expenditures for maintenance and repairs have been made at the Williamsburgh power plant and to this fact the increase is largely due. The operation of cars showed an increased cost of approximately $87,000 due to a higher rate of wages paid and bonuses awarded for operation of cars without accidents referred to later.

INCOME STATEMENT OF THE BROOKLYN CITY RAILROAD
For the Year Ended June 30

	1927	1926
Passenger revenue	$11,460,569	$11,399,283
Other car revenue	15	90
Total transportation revenue	$11,460,584	$11,399,373
Advertising and other privileges	99,999	96,666
Rent of land and buildings	19,153	126,526
Rent of tracks and terminals	53,402	54,527
Sale of power	17,784	*
Miscellaneous revenue	834.7	820
Total operating revenue	$11,651,759	$11,677,915
Operating Expenses		
Maintenance — Way and structures	$1,361,543	$1,327,310
Equipment	1,177,232	1,216,427
Power	1,119,829	1,047,848
Operation of cars	4,306,739	4,219,640
Injuries to persons and property	†854,157	636,747
General and miscellaneous expenses	506,554	515,129
Total operating expenses	$9,326,056	$8,963,104
Net operating revenue	$2,325,702	$2,714,810
Taxes assignable to operations	714,541	768,707
Operating income	$1,611,161	$1,946,103
Non-operating income	72,493	92,854
Gross income	$1,683,654	$2,038,958
Income Deductions		
Interest	$512,492	$500,810
Rent of cars and tracks	25,044	79,275
Other deductions from income	25,529	36,135
	$563,066	$616,222
Net income	$1,120,587	$1,422,736

*Sale of power amounting to $13,345 was deducted from operating expenses for the year to June 30, 1926.
†For 1927 actual expenses. For 1926 $173,438 additional charged to casualty and insurance reserve.

Accident Cases Have Been Reduced

The actual increase in the payments for injuries to persons and property over 1926 was $43,971 as, in addition to the amount shown in the 1926 income statement, the reserve for such purpose was drawn upon during that year for $173,438. For some years prior to 1926 there was a constant accumulation of accident cases, which during 1927 has been materially reduced.

The reduction of $54,000 in income deductions under item of rents was due to the fact that during the early portion of the fiscal year 1926 a considerable amount was paid for rental of cars, which was later obviated by the delivery of its newly purchased cars.

The report explains the status of the proposed general and refunding mortgage plan which was denied and states that as of the date of the report the amount of the outstanding loans had been reduced from $800,000 to $200,000.

A proceeding instituted by the company against the receiver of the Brooklyn Heights Railroad, which has been pending for some years, to recover the net earnings of the property of the Brooklyn City Railroad between July 14 and Oct. 18, 1919, has been finally adjudicated in favor of the Brooklyn City Company, which has benefited by the receipt of a net amount approximating $100,000.

A bonus plan was adopted on Aug. 1, 1926, under which all employees operating their cars for certain periods without an accident receive a bonus. Since this plan has been in operation the number of accidents has decreased 13 per cent.

On the subject of buses the report mentions the granting of a franchise to the Equitable Coach Company for the operation of bus lines in the Borough of Brooklyn. Many of the routes covered by the Equitable are directly competitive and parallel to the car lines of the Brooklyn City Company and Mr. Porter promises that officers and counsel will appear before the commission in opposition.

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Personal Items

Thomas W. Wilson President at Wilmington

At a meeting of the board of directors of the companies held on Sept. 29 Thomas W. Wilson was elected president of the Wilmington & Philadelphia Traction Company, Wilmington, Del., and of the subsidiary railway and bus companies in both Delaware and Pennsylvania. He was also re-elected general manager. These companies recently came under the control of Stevens & Wood, Inc., through purchase of the stock of the American Electric Power Company from the American Gas & Electric Company.

Mr. Wilson was for many years associated with the International Railway, Buffalo, N. Y., first as chief engineer and for seven years as general manager. He held that position until 1912, when he removed to Wilmington, Del., to become vice-president and general manager of the Wilmington & Philadelphia Traction Company. Immediately after his graduation from Lehigh University he entered the engineering department of the Pennsylvania Steel Company. He remained there several years, leaving to become engineer of the Charleston City Railway, Charleston, S. C.

He is a member of the board of directors of the American Electric Power Company and of its various controlled companies in Delaware and Pennsylvania. He is a past-president of the New York State Railway Association and for many years has been closely identified with the American Electric Railway Association and the Pennsylvania Street Railway Association. He is also identified with many financial, commercial and social organizations in Wilmington and Philadelphia.

The new president was born in New York City in 1872. At the outbreak of the Spanish-American War he enlisted in the Eighth Pennsylvania Volunteer Infantry and served as topographical engineer of the Second Army Corps until mustered out at the end of the war.

Messrs. Denman and Chamberlain Removed to Chicago

B. J. Denman, president of the Tri-City Railway & Light Company, and his assistant, W. I. Brown, are moving their headquarters from Davenport, Iowa, to Chicago, Ill. William Chamberlain, vice-president and general counsel of the United Light & Power Company, which controls the United Light & Railways, will also move to Chicago with Assistant Humphrey. Many points, both east and west, which Messrs. Denman and Chamberlain must visit frequently are more accessible from Chicago than from Davenport or Cedar Rapids. In Chicago their headquarters will be in the United Light financial and executive offices. No changes in personnel or management are involved in this move, the engineering and operating offices remaining in Davenport as heretofore.

F. H. Crosby Vice-President at Oakland

F. H. Crosby, who recently became a director of the Key System Transit Company, Oakland, Cal., will also serve as vice-president. He will be chief aid to President Alfred J. Lundberg. Mr. Crosby, a representative of J. Barth & Company, brokers, who now control a majority of the Key System stock, is known in the field of public utilities through his connection with a number of independent telephone companies.

"High Power" Savage Over There

The intrenchment of the American Legionnaires in the affections of Pershing, Premier and Pope is attributable in great part to the persuasive powers and winsome ways of Howard Paul Savage, a Mid-Western railway man. Mid trumpets and torches, shouts and songs, he and his buddies are marching through Europe renewing friendships at Armentières and bowing reverential heads in Flanders Fields. When he communes appealingly with the dead at Suresnes or issues orders for furloughs in Montmartre, one wonders whether this American son of toil is making history for the American Legion or whether the Legion is making history for its retiring commander. For in this genial, gray-haired, 42-year old member of the American Expeditionary Forces is another fulfillment of dreams dreamed in the land of promise. Even the most visionary would never have seen in the young man who entered electric railway work in 1913 on the Metropolitan West Side Elevated Railroad of Chicago as track foreman an important factor in re-establishing and restoring friendly relations between the old and the new worlds.

Late in 1926 "High Power" Savage, as he was affectionately known on the "L," was made assistant general manager of the Chicago, North Shore & Milwaukee Railroad at the same time that John F. Egolf was made general manager. He had been serving the Chicago Rapid Transit Company as general superintendent of maintenance of way following a promotion from the position of track engineer.

With the outbreak of the war he secured a leave of absence and obtained a commission in the 55th Engineers, serving in France from July, 1918, until July, 1919. On his return to civil life he resumed his position with the Rapid Transit Lines in accordance with the policy of all utilities under the management of Samuel Insull and associates. Immediately on his return he formed Chicago Elevated Post, No. 184. He was the first commander of that post and was a post state commander of Illinois. Conspicuous among his achievements in Legion affairs have been his activities in securing the soldiers' bonus, in increasing Legion membership and in planning a sound financial basis for all posts. It was because of his tireless efforts and notable accomplishments for that organization that the great honor of national commander was conferred upon him at the annual convention of the American Legion on Oct. 15, 1926, in Philadelphia. When he returned to Chicago a mighty throng turned out to meet him. There will no doubt be a vast crowd to meet him when he returns to America, greater in number and louder in acclaim that the greeting he received in Chicago a year ago. At that time Bernard J. Fallon, vice-president of the Chicago Rapid Transit Company and official spokesman of the occasion, called Col. Savage "a credit to Chicago and a credit to the nation, the type of man Chicago needs." The spokesman for the coming occasion can do no better than reiterate these sentiments.

May the diamond-studded gold key to the Hotel des Nations Americaines be his perpetual passport to the countries of Europe and may the cross of the federation bestowed upon him in Brussels motivate him in "carrying on" for the North Shore road and for his stalwart buddies.

William H. Hodges, Vice-President of Byllesby Engineering

"The father of customer-ownership," William H. Hodge, has been elected a vice-president of Byllesby Engineering & Management Corporation and appointed a manager of a newly created sales and advertising department of that company at its Chicago headquarters. The sales and advertising department will have general charge of the development of new business and advertising at all of the Byllesby utility properties, which now compose one of the larger groups of these enterprises under unified management in the United States.

Mr. Hodge has been connected with the Byllesby organization since 1910 as manager of the advertising and publicity department. He had a prominent part in the development of the customer-ownership plan of financing by utility companies and in their public relations and commercial activities.

GEORGE J. BAKER, superintendent of the Buffalo & Erie Railway, Fredonia, N. Y., was made general manager on Oct. 1. He entered the service of the Buffalo & Lake Erie Traction Company, the predecessor of the Buffalo & Erie Railway, in 1902 as a conductor on the city lines in Buffalo.

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Manufactures and the Markets

Platform Adopted by National Association of Manufacturers

Seventy-five members of the Platform of the Platform of American Industry Committee, called together by the National Association of Manufacturers, met recently in the Waldorf-Astoria Hotel, New York, and adopted the following fourteen planks for incorporation in the national platform to be submitted to both the Republican and Democratic parties next year. The planks are as follows: Government and business, taxation, regulation of combinations, employment relations, transportation, immigration and naturalization, international relations, tariff, foreign trade policies, merchant marine, Federal Reserve Bank system, waterways development, flood control and agriculture.

The fourteen planks will be drawn up by as many sub-committees working under a general drafting committee of eleven men from various parts of the country. The fourteen subcommittees will be appointed in the next fortnight. John E. Edgerton, president of the National Association of Manufacturers, was chosen chairman of the general committee. The drafting committees will shape up the various planks and report their conclusions at the annual convention of the manufacturers to be held in Chattanooga, Tenn., October 25, 26 and 27.

Secretary Davis Misunderstood on Indiana Coal Situation

The bituminous coal strike was discussed by President Coolidge and his advisers Sept. 13 at the first Cabinet meeting to be held following the return of the Chief Executive from South Dakota. The verbal statement of this discussion was misinterpreted by some of the daily newspapers into an announcement that went beyond the facts stated. It was stated verbally at the White House, following the Cabinet meeting, that Secretary of Labor Davis had reported to the President that developments in Illinois indicate a "strong probability" of the strike being settled in that state soon. It also was stated that the Secretary had reported 55 per cent of the mines of Indiana operating under the old Jacksonville agreement, which was interpreted as meaning that the strike was "55 per cent settled in Indiana." The President was informed, it is understood, that there is a large tonnage of bituminous coal above ground, which would indicate no danger of a shortage of supply, and that there is nothing in the soft coal price situation to indicate a shortage of supply.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Oct. 4, 1927
Copper, electrolytic, cents per lb	12.90
Copper wire, cents per lb	15.25
Lead, cents per lb	6.25
Zinc, cents per lb	6.00
Tin, Straits, cents per lb	59.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.625
Kansas screenings, Kansas City, net tons	2.70
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.2
White lead in oil (100-lb. keg), N. Y., cents per lb	13.75
Turpentine (bbl. lots), N. Y., per gal	$59.0

Huge Storage Battery Switching Locomotive

State Line Generating Company, Hammond, Ind., has just placed in service the largest storage battery locomotive in the world. It is capable of pulling a 1,500-ton train and its total weight is 100 tons.

The locomotive, built by the General Electric and the Electric Storage Battery Companies, has all the advantages of an electric locomotive, but does not require an overhead trolley or third rail for its power. The manufacturers claim that it is noiseless and smokeless in operation and can accelerate quicker and move a heavy load much faster than other types of switching locomotives. Its huge storage battery, weighing 39 tons, the largest ever manufactured for this purpose, will deliver 1,000 hp. to the driving motors. This power is equivalent to 1,579 six-volt batteries such as used for radio purposes, or is sufficient to crank 1,600 automobiles simultaneously. A motor-generator set installed in the cab will permit the charging of the battery from a 2,300-vilt circuit in the plant.

Westinghouse Awards War Memorial Scholarship

Awards were recently made to two Pittsburgh and two New York boys in the 1927 War Memorial Scholarship of the Westinghouse Electric & Manufacturing Company. The scholarships, established in memory of the Westinghouse employees who lost their lives in the World War, carry a fund of $500 a year and are good for a period of four years.

The winners in the 1927 contest were: H. L. Bunker, Jr., son of H. L. Bunker, rate setter, East Pittsburgh Works; P. J. Glaister, tester, East Pittsburgh Works; M. T. Ayres, son of M. C. Ayres, foreman of dial markers, Newark Works, and A. L. Kine, son of R. R. Kine, salesman, New York office. Successful contestants were selected on a basis of mental, physical and social activities.

Ten Semi-Steel Cars Being Built for Boston Elevated

The ten cars ordered by the Boston Elevated Railway, Boston, Mass., on Aug. 3 from the Laconia Car Company, Laconia, N. H., as announced in the Aug. 20 issue of the JOURNAL, are to be delivered during the 40-day period between Dec. 1, 1927, and Jan. 10, 1928. They are to be placed in service in South Boston and will replace the old box cars now in use there.

The cars, with a seating capacity of 48, are being built at a cost of approximately $12,000 each. They are of the one-man, two-man, double-end, double-truck type, having a total weight of 31,460 lb. and a length over all of 45 ft. 0 in. The body is of semi-steel construction with end doors and has an arch roof. The seating arrangement includes four longitudinal and sixteen cross seats, with a spacing of 29⅝ in. The painting scheme is to be yellow.

Operating equipment includes four G.E. 264-A inside-hung motors, G.E. K-71 control and Westinghouse air brakes with variable load attachment.

The official specifications are as follows:

No. of units	10
Type of unit	One-man, two-man, motor, passenger, city, double end, double truck
Seating capacity	48
Builder of car body	Laconia Car Company
Date of order	August 3, 1927
Date of delivery	Dec. 1, 1927, to Jan. 10,1928
Weights:	
Car body	13,800 lb.
Trucks	8,700 lb.
Equipment	8,960 lb.
Total	31,460 lb.
Bolster centers	20 ft. 9 in.
Length over all	45 ft. 0 in.
Length over body posts	30 ft. 11¼ in.
Truck wheelbase	5 ft 2 in.
Width over all	8 ft. 6¼ in.
Height, rail to trolley base	10 ft. 7½ in.
Window posts spacing	31½ in.
Body	Semi-steel
Roof	Arch
Doors	End, folding
Air brakes	Westinghouse, variable load attachment
Armature bearings	Plain
Axles	Pittsburgh Forge & Iron Company
Compressors	DH-16
Conduit	Flexibe
Control	General Electric K-71
Couplers	Malleable iron sleeve
Destination signs	Keystone
Door mechanism	National Pneumatic Company
Energy-saving device	Railway Improvement Co.
Fare boxes	Johnson
Finish	Flood-Conklin
Floor covering	Wood
Gears and pinions	General Electric spur
Glass	Double thick
Hand brakes	National staffless
Hand straps	Rico
Heat insulating material	Salamander
Heaters	Consolidated Car Heating Company
Headlights	Dressel
Headlining	Bronze and malleable iron
Journal bearings	Plain
Journal boxes	Steel castings
Lamp fixtures	Weber No. 61000
Motors	Four General Electric 26-A, inside hung
Registers	International single
Roof material	Wood and canvas
Seats	J. G. Brill Co.—4 longitudinal
Seat spacing	29½ in.
Seating material	Wood slat
Slack adjusters	M-1
Steps	Folding
Step treads	Wood universal tread nosing
Trolley catchers	Earll
Trolley base	Ohio Brass
Trucks	Taylor, type LRH
Ventilators	Garland
Wheels, type	Steel, 26-in. diameter
Wheelguards	Wood life guards on trucks

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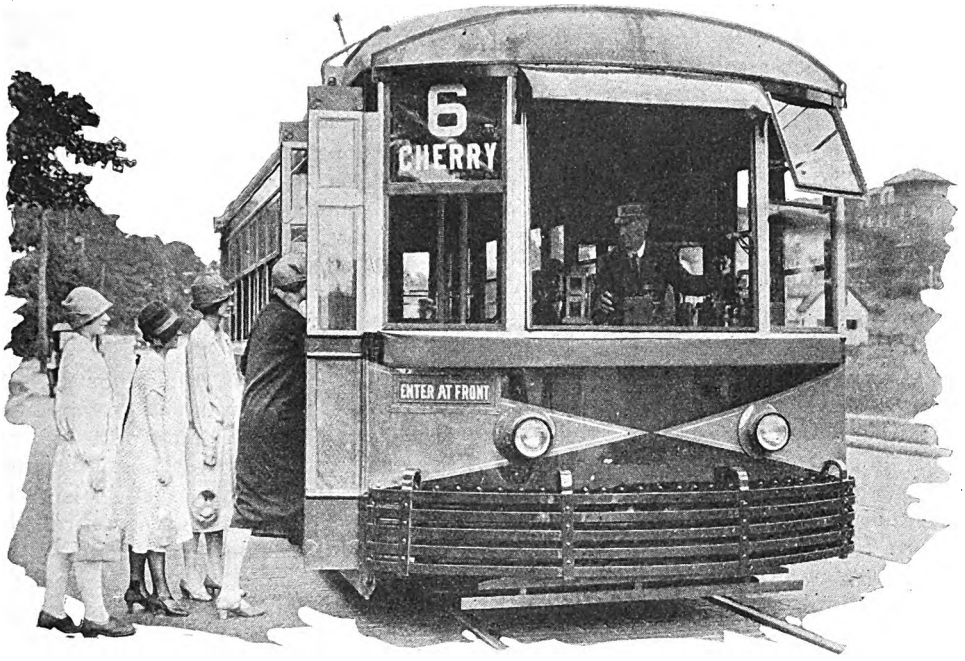

This view of one of the new Grand Rapids "rail coaches" gives a very good idea of its inviting appearance, as well as the effective outlook possessed by the operator

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Grand Rapids Railroad in its presentation for 1927 says its new cars were the backbone of nearly the whole of the recent merchandising and public relations campaigns. The following series of articles in this issue, based upon the Grand Rapids brief, tell the details of the accomplishments

BREADTH of the influence exerted throughout the country by the practices and accomplishments of the Grand Rapids Railroad is cited by the Coffin Award Committee in its report awarding the 1927 Coffin Prize to this comparatively small city property in a community of 160,000 population. With limited facilities, on its own initiative, and largely with its own resources, this comparatively small railway property, which was scarcely known outside of its own city a few years ago, undertook to demonstrate to the world the process of popularizing electric railway service.

In its brief the company frankly says that the major step taken in making possible its accomplishments was the development of its new rail coaches. Their significance, the brief says, goes far beyond a mere contribution to car design and lower operating costs. The primary motive in their development was that of merchandising transportation service. They represent to the public the beginning of a new day in mass transportation. They have been the basis for all the company's merchandising and public relations campaigns. Without them but a small fraction of the progress realized could have been made. In very large measure, the profound change which has taken place in public sentiment toward the company and toward street railway transportation in Grand Rapids is attributed to the popularity of the improved equipment, which has transformed the common attitude toward riding in street cars from one of apology to one of enthusiasm. The cars were the talk of the city, and, indeed, of the country. Seemingly, all the city, individuals and officials, suddenly found themselves voicing pride in the Grand Rapids railway service.

A striking thing about all this change is that these new cars were only 30 out of 127 on the system. Nevertheless, they developed so much good will that it served to take out of mind the antipathy toward the older cars too.

The main features are the comfort and beauty of soft leather bucket-type automobile seats, mosaic rubber tile floor covering, special illumination, cabinet-inclosed control mechanism, easy ingress and egress, bright colored painting and streamline body with aprons emphasizing the low-hung appearance, notable noiselessness, beauty of large plate glass vestibule windows and illuminated dash. Further particulars of these cars will be found in previous issues of this paper, particularly in that of May 29, 1926.

Influence of New Cars on Riding

The new cars provided practically the complete service on three lines, so it was easy to determine their influence on riding. The three lines equipped with the new cars showed as a whole a substantially larger increase in total revenue than the remainder of the system equipped with old cars. One of these three lines had some decreases, but

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it serves many industries, mostly furniture factories, while the two others are residential lines. One of these latter serves the city's best residential section. It was the earliest line to show a decline in earnings with the advent of the automobile. It is now one of the first lines to indicate a return of lost patrons, as the new coaches induce residents to leave their autos at home and take advantage of the comfortable ride on the new cars where they "Relax—Don't Worry."

Special Means of Creating Traffic

The method of putting these cars in service indicates that the Grand Rapids company possesses good merchandising ability. When the day came for placing the 27 new rail coaches in service, they were not unceremoniously started on their runs. A parade of the whole fleet was arranged. It afforded a dramatic way of impressing people with an event of very real importance to them. And incidentally, thousands of those who came downtown to witness the well-heralded new cars rode down and back on street cars and swelled the revenue for that day, and for succeeding days, too, for to view the new cars was to desire to try them out. Of course this interest spread rapidly to neighbors and friends, and they rode.

After building toward the big climax with display advertising, feature stories, banners and other media, the company announced the date of its now historical street car bonfire and jollification on the West Michigan Fair Grounds, which is at the terminal of one of the company's long lines. Seventeen old cars furnished the funeral pyre. More than 50,000 people jammed into the Fair Grounds to enjoy the free admission, free grandstand seats, band concert, illuminated balloon flight and fireworks display, and to witness Mayor Elvin Swarthout and the company's vice-president apply the torches to either end of the long line of cars that had outlived their usefulness.

As was expected, thousands of autoists motored to the bonfire and were given free rein in parking. At the conclusion of the jollification a situation arose that did more to impress the serviceability and reliability of the street car than reams of advertising could have accomplished. There was an uncontrolled rush by autoists to get their cars out of the grounds. Naturally a tangled jam resulted, and it was two hours before the last autoist left the grounds, shortly after midnight. While this delay to private autos prevailed, railway passengers were promptly started home, the last passengers getting away nearly two hours before the last automobile.

* * * * * *

The Prize Winner This Year

What It Is and Has Done

THE Grand Rapids Railroad is exclusively a transportation utility, supplying Grand Rapids, Mich., and immediate vicinity with street car and motor bus service. It comprises 68.4 miles of track, on the single-track basis, which serves approximately 95 per cent of the population, on the assumption that any resident within one-fourth mile of a street car line is adequately served. The company owns and maintains car shops, paint shops, three carhouses, a bus garage, a general information office for the use of the public and an amusement park.

The total number of persons employed by the company on July 1, 1927, was 550. The total number of passenger cars owned and operated by the company is 127, besides the necessary complement of snow-plows, sweepers and other working equipment. The base week-day schedule requires 89 cars and the rush hour 112 cars.

Grand Rapids has a population of about 160,000. Its topography makes operation somewhat difficult. The city is built upon both sides of Grand River, which flows through its center and in close proximity to its business district. Severe hills necessitate tracks on long 9 per cent grades and require very high energy consumption as well as special equipment and operating precautions in the interest of safety.

The main business district is flanked on the west by the river. Three blocks to the east the hills rise abruptly and extend eastward to the fringe of the residential sections. The natural barriers of hills and river have caused the business district to be built practically along one main artery of traffic, Monroe Avenue, through which a great share of the traffic passes. Into this narrow gateway pour thousands of automobiles, taxicabs, trucks and the tourists on their way to and from northern Michigan resorts. This greatly hampers the speed and regularity of street car schedules, while cross-town traffic over the bridges adds to the perplexity of the situation.

Farther to the north along the banks of the river, between the hills that bound the city on the west and fringe the high land that swings to the northeast, are wide-reaching valleys and undulating uplands through which are found the only transportation avenues. To the southwest, near the shore of the river and in the valley below the Black Hills, nestle many factories.

An Automobile for Every 3½ Inhabitants

The eastern, southeastern and mid-west sections are thickly settled, causing a density of population unusual in cities the size of Grand Rapids, and also presenting another trying situation for the railway company. The city has 150 miles of paved streets and more than 100 miles of improved streets not paved. The city's population of about 160,000 lives within an area of approximately 23 square miles, which makes the sidewalks as great a competitor of the railway as private automobiles. Of the latter 44,829 were registered this year in Grand Rapids—one for each 3.5 residents. Revenue rides per capita for the year ended Dec. 31, 1926, were 116, based on 160,000 population and including rides on both cars and buses.

Grand Rapids is a manufacturing center, and while its industries are fairly diversified, furniture accounts for about 50 per cent of its products in point of value and 50 per cent of the total number employed. Hence, any depression in this one industry has a very appreciable

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effect on the business of the railway. Furniture is a seasonal product, and it is one of the first industries in the city to feel business slumps.

Modernization Program Outlined

The close of the war found this property in much the same condition as other small railways over the country. It was badly run down. Rolling stock was in such poor repair that on many days there were not sufficient cars to fill the regular runs. Little or nothing had been expended in reconstructing track, only enough to maintain service, such as it was. Besides the bad condition of the physical plant, the financial situation was also little short of desperate. Naturally, with the service reflecting these conditions, the public was unsympathetic if not antagonistic.

With faith in the industry and its future, the management set about to rebuild in every way and to re-establish the company in its proper place in the minds of its customers and its investors.

It is noteworthy that this modernization program, spreading over a period of five years, has been carried out step by step in a practical way along the lines recommended by the Federal Electric Railways Commission appointed by President Wilson, and has also comprised in many instances the conclusions reached by various committees of the American Electric Railway Association.

The various steps in this program are best briefed in the chronological order in which each task was undertaken and carried to successful conclusion:

First Step Taken in 1922

The first major step in the program came with the granting of a new franchise in 1922, the old franchise having expired in 1920. From 1920 to 1922 the railway had operated under a day-to-day permit, which was very unsatisfactory.

In a remarkably short time, as securing of franchises goes, a 30-year service-at-cost franchise was secured, 72 per cent of the voters giving it their approval, though no prospect of a lower fare was offered. This franchise safeguarded the company's interests by providing for the elimination of jitneys and other competitive motor vehicle transportation. It embodied the right to earn an 8 per cent return on the investment. Its adoption aided in gaining relief from unjust taxes in the form of sprinkling expense and salaries of traffic policemen. A necessary step in securing this franchise was a revaluation fair to both company and city. The book value of the property was written down from $8,571,580 to an agreed valuation for rate-making purposes of $5,500,000. All major provisions of the new grant were in accord with the recommendations of the Federal Electric Railways Commission.

Five-Year Building Program Undertaken

The fine support of the public in approving the franchise prompted the company to go forward with its plans at once for improvement of the physical condition of the property. This rebuilding program naturally covered the renewal and rebuilding of rolling stock and the reconstruction and extension of tracks in conformity with the transit plan adopted by the city. It also included the abandonment of certain track where duplication of service existed.

A five-year building program was laid out and from 1922 to 1926, inclusive, $1,633,044 was expended, which is equal to 50 per cent of the total value of track and roadway at the time reconstruction work began. During this period property to the value of $833,381 was retired from service, of which 12 per cent was due to duplication of service. All new money required for this construction program was secured without outside assistance.

It was during 1923, when serious consideration was being given rehabilitation of equipment, that preliminary plans were laid for a new design of cars. These came to fruition in 1926 when 27 new "rail coaches" were put in operation, as mentioned on page 782.

Financial Improvement Followed Next

The next step undertaken was a financial one, involving the reissue of bonds to replace those maturing in 1924. In that year $3,700,000 matured and a new issue was made. Notwithstanding the general uncertainty with which traction securities were looked upon and the precarious position of electric railways generally, this issue was entirely subscribed within an hour after it was placed on the market. This event did not merely happen. Dillon, Read & Company acted as brokers and only took the issue after their engineers had made repeated and exhausted study on the property. A feature of their report was the suggestion that the very strong public relations position of the company gave these securities an uncommon worth.

This refunding was carried out without change in the capital structure, another evidence of the confidence and returning good will of the people and investors toward the Grand Rapids company.

During 1924 a schedule department was established, resulting in economies through decreased man-hours and car-miles and increased running speed.

On July 19 fire destroyed the Hall Street carhouse and 57 cars. This disastrous loss was taken advantage of to promote the new type of electric coach for which plans had been partially completed. This course of action meant that it would be necessary to operate old and obsolete borrowed equipment for the time necessary to bring the new cars into operation, but the public, taken into the confidence of the management and fully advised of the circumstances, gave its hearty support and waited with unusual patience until the new coaches were placed in service.

Test Cars Revolutionized Design Ideas in 1925

In the early spring of 1925 delivery was made of three test coaches which had been worked out with the cooperation of three car builders, in accord with the design proposed by the railway.

In view of the somewhat radical changes which had been made in design, it was deemed advisable to make a thorough test of these three cars to determine the relative merit of the innovations, with a view to adopting a final composite design of car which would incorporate all of the features found to have merit. The aim was to provide a light-weight car which would carry a new appeal in comfort and appearance.

In order to keep the industry advised as to the progress made, these cars were taken to Atlantic City for exhibition purposes at the annual convention of the A.E.R.A. The enthusiasm with which they were received gave evidence of the industry's approval of the company's effort to furnish the public rides comparable with those in automotive vehicles.

After these cars had been in service during the year,

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Manufactures and the Markets

Platform Adopted by National Association of Manufacturers

Seventy-five members of the Platform of the Platform of American Industry Committee, called together by the National Association of Manufacturers, met recently in the Waldorf-Astoria Hotel, New York, and adopted the following fourteen planks for incorporation in the national platform to be submitted to both the Republican and Democratic parties next year. The planks are as follows: Government and business, taxation, regulation of combinations, employment relations, transportation, immigration and naturalization, international relations, tariff, foreign trade policies, merchant marine, Federal Reserve Bank system, waterways development, flood control and agriculture.

The fourteen planks will be drawn up by as many sub-committees working under a general drafting committee of eleven men from various parts of the country. The fourteen subcommittees will be appointed in the next fortnight. John E. Edgerton, president of the National Association of Manufacturers, was chosen chairman of the general committee. The drafting committees will shape up the various planks and report their conclusions at the annual convention of the manufacturers to be held in Chattanooga, Tenn., October 25, 26 and 27.

Secretary Davis Misunderstood on Indiana Coal Situation

The bituminous coal strike was discussed by President Coolidge and his advisers Sept. 13 at the first Cabinet meeting to be held following the return of the Chief Executive from South Dakota. The verbal statement of this discussion was misinterpreted by some of the daily newspapers into an announcement that went beyond the facts stated. It was stated verbally at the White House, following the Cabinet meeting, that Secretary of Labor Davis had reported to the President that developments in Illinois indicate a "strong probability" of the strike being settled in that state soon. It also was stated that the Secretary had reported 55 per cent of the mines of Indiana operating under the old Jacksonville agreement, which was interpreted as meaning that the strike was "55 per cent settled in Indiana." The President was informed, it is understood, that there is a large tonnage of bituminous coal above ground, which would indicate no danger of a shortage of supply, and that there is nothing in the soft coal price situation to indicate a shortage of supply.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Oct. 4, 1927
Copper, electrolytic, cents per lb.	12.90
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.25
Zinc, cents per lb.	6.00
Tin, Straits, cents per lb.	59.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons.	1.625
Kansas screenings, Kansas City, net tons	2.70
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.55
Weatherproof wire base, N.Y., cents per lb.	5.20-5.70
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.2
White lead in oil (100-lb. keg), N. Y., cents per lb	13.75
Turpentine (bbl. lots), N. Y., per gal.	$59.0

Huge Storage Battery Switching Locomotive

State Line Generating Company, Hammond, Ind., has just placed in service the largest storage battery locomotive in the world. It is capable of pulling a 1,500-ton train and its total weight is 100 tons.

The locomotive, built by the General Electric and the Electric Storage Battery Companies, has all the advantages of an electric locomotive, but does not require an overhead trolley or third rail for its power. The manufacturers claim that it is noiseless and smokeless in operation and can accelerate quicker and move a heavy load much faster than other types of switching locomotives. Its huge storage battery, weighing 39 tons, the largest ever manufactured for this purpose, will deliver 1,000 hp. to the driving motors. This power is equivalent to 1,579 six-volt batteries such as used for radio purposes, or is sufficient to crank 1,600 automobiles simultaneously. A motor-generator set installed in the cab will permit the charging of the battery from a 2,300-vilt circuit in the plant.

Westinghouse Awards War Memorial Scholarship

Awards were recently made to two Pittsburgh and two New York boys in the 1927 War Memorial Scholarship of the Westinghouse Electric & Manufacturing Company. The scholarships, established in memory of the Westinghouse employees who lost their lives in the World War, carry a fund of $500 a year and are good for a period of four years.

The winners in the 1927 contest were: H. L. Bunker, Jr., son of H. L. Bunker, rate setter, East Pittsburgh Works; P. J. Glaister, tester, East Pittsburgh Works; M. T. Ayres, son of M. C. Ayres, foreman of dial markers, Newark Works, and A. L. Kine, son of R. R. Kine, salesman, New York office. Successful contestants were selected on a basis of mental, physical and social activities.

Ten Semi-Steel Cars Being Built for Boston Elevated

The ten cars ordered by the Boston Elevated Railway, Boston, Mass., on Aug. 3 from the Laconia Car Company, Laconia, N. H., as announced in the Aug. 20 issue of the JOURNAL, are to be delivered during the 40-day period between Dec. 1, 1927, and Jan. 10, 1928. They are to be placed in service in South Boston and will replace the old box cars now in use there.

The cars, with a seating capacity of 48, are being built at a cost of approximately $12,000 each. They are of the one-man, two-man, double-end, double-truck type, having a total weight of 31,460 lb. and a length over all of 45 ft. 0 in. The body is of semi-steel construction with end doors and has an arch roof. The seating arrangement includes four longitudinal and sixteen cross seats, with a spacing of 29⅝ in. The painting scheme is to be yellow.

Operating equipment includes four G.E. 264-A inside-hung motors, G.E. K-71 control and Westinghouse air brakes with variable load attachment.

The official specifications are as follows:

No. of units	10
Type of unit	One-man, two-man, motor, passenger, city, double end, double truck
Seating capacity	48
Builder of car body	Laconia Car Company
Date of order	August 3, 1927
Date of delivery	Dec. 1, 1927, to Jan. 10,1928
Weights:	
Car body	13,800 lb.
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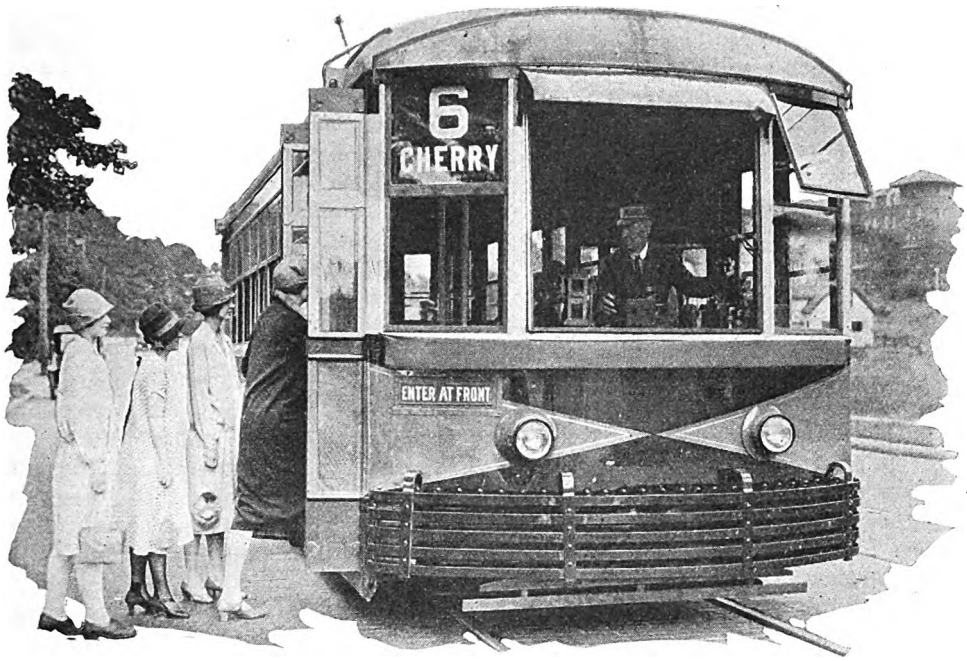

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a composite design of coach was evolved incorporating those features which had shown up well in the test period and had proved to be salient in the sale of transportation. Plans were completed and orders placed to equip three lines.

Improvement Program Reached Climax in 1926-1927

The rehabilitation of the physical property of the railway company reached a climax in June, when 27 new electric coaches were delivered. These cars were placed in regular service and almost immediately increased car riding was enjoyed, confirming the expectations of the company that the new idea in cars would create increased car riding as well as effect decreased operating expenses. The biggest return, however, was the intangible value of the reaction upon the public. This was particularly helpful just at this time as it thus became easier and more popular for the City Commission to work with the company.

The first six months of the year 1927 have seen the culmination of the crowning accomplishment in the program, as affecting the financial future of the company. This was the revamping of the financial structure, very much along the lines recommended by the advisory committee on finance, A.E.R.A., 1925.

It is the belief of the management that, with continuance in the betterment of the physical property and with the financial structure of the company reorganized and placed on a substantial footing, the future of the railway company is now assured both from the standpoint of its investors and the public.

The reorganization of the Grand Rapids Railroad was undertaken in the interest of the holders of preferred stock, to re-establish credit and permit reduction of the fixed charges, which had been too great a burden. It provided for the extinguishment of $600,000 of bonded indebtedness and reduced the annual cash outlay $140,000. The immediate results obtained and the ultimate benefits which will be derived from this reorganization are given in detail elsewhere.

During the months that have gone by in the year 1927 the rehabilitation program as outlined has been steadily carried forward and the results have been very gratifying. During 1926 the total operating expense was $1,108,709, as compared with $1,172,157 in 1925, a reduction of $63,447, or 5.41 per cent. The inauguration of the electric rail coaches has resulted in increased popularity of car riding. This is shown by an increase in gross revenue from $1,738,779 in 1925 to $1,776,758 in 1926, an increase of 2.18 per cent. This increase is the more remarkable because the coaches did not go into operation until the middle of June, 1926.

In general, this extensive five-year rehabilitation program has resulted in economy of operation, improved service, improved earnings, a profound improvement in public good will, and has gained for the Grand Rapids Railway widespread recognition in the transportation field. This brings the company to the place now where it has laid out and is embarking upon a new ten-year program of betterment and construction, which should shortly bring the property up to and maintain it in a virtually 100 per cent condition.

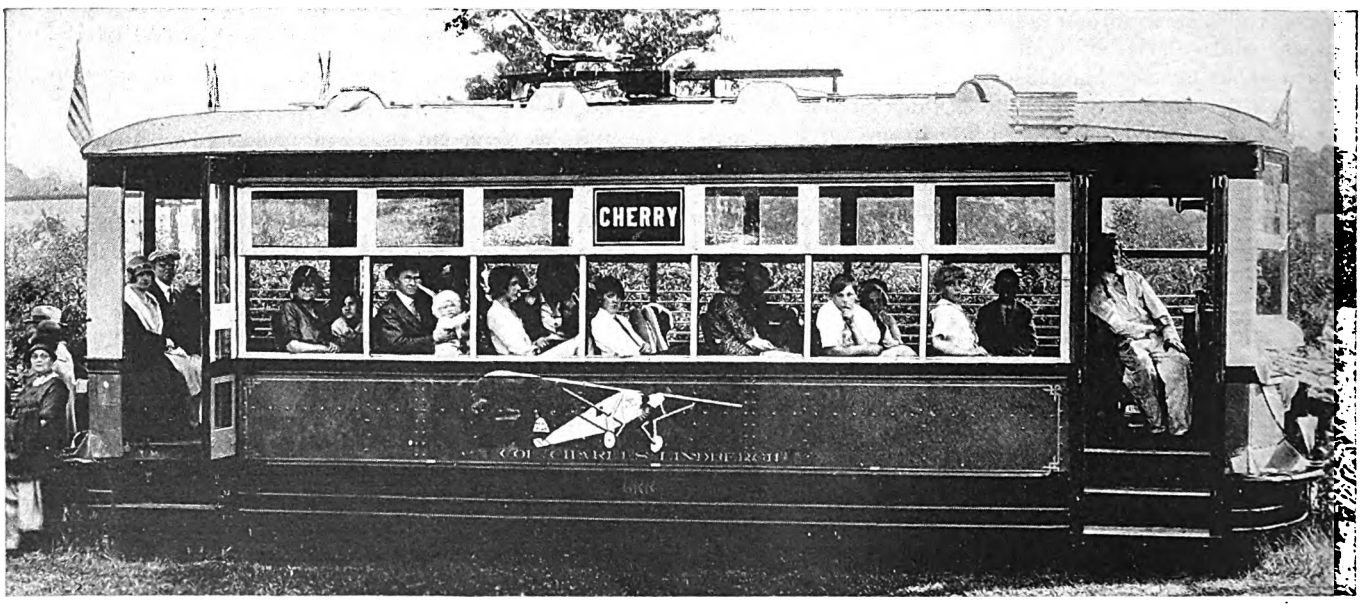
* * * *

Car Named After Colonel Lindbergh

Prize-winning company accedes to request of Grand Rapids Flying Club to act as sponsor for coach named after noted aviator

THE practice of naming electric railway cars after distinguished local citizens is followed in Grand Rapids as well as in some other cities. Grand Rapids has gone a step farther, however, and on Sunday, June 19, 1927, one of its electric rail coaches was dedicated to Col. Charles A. Lindbergh. A suggestion for this ceremony was conveyed to the officers of the Grand Rapids Flying Club, in the belief that it would be in keeping with the spirit of the time and strengthen the efforts of the club to gain greater public support for the local airport. The club agreed.

Accordingly, a request was made by the Flying Club,



The Lindbergh car shows what can be done to make rebuilt Birney cars attractive, comfortable and less noisy

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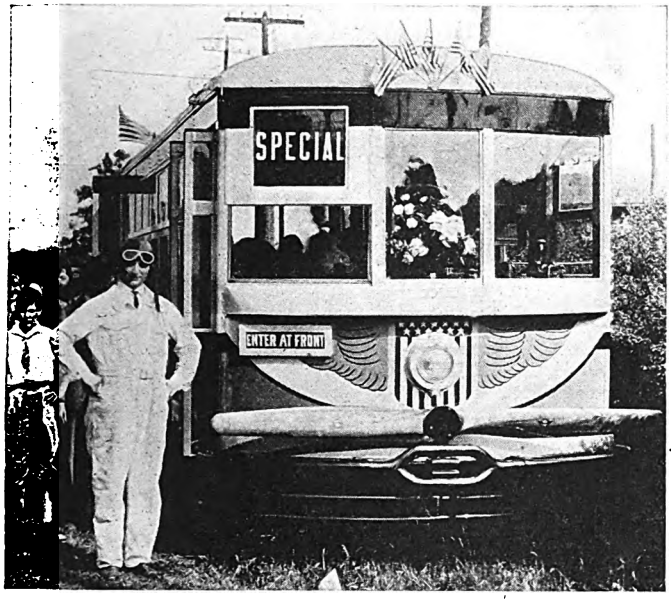


The Grand Rapids "Colonel Lindbergh" car carried appropriate front decorations and the operator was dressed in flying costume. The air propeller over the coupler was removed when the car was put in operation

through its president, to the railway management to permit the club to sponsor such a coach at a public dedication. A coach was being rebuilt in the company's shops at the time, and to take advantage of this opportunity it was promptly decorated to serve this purpose. News stories and advertising informed the public of the event, which was held at Ramona Park at 5 p.m. This hour was chosen so as not to conflict with a public concert in the John Ball Park at the end of another car line, where during the early afternoon the Elks Band played for the first time in Grand Rapids "The Spirit of St. Louis."

At 2 p.m., to accommodate the public, the Lindbergh coach was placed on public exhibition and inspection. More than 2,000 people passed through and praised it during the hours until the dedication.

The ceremony was also broadcast by the local radio station, WOOD. Several thousand people crowded about the car during the ceremony and airplanes from the local airport flew low overhead and dropped flowers on the coach. Of course telegrams were sent by the Flying Club to Colonel Lindbergh and his mother telling them of the dedication in his honor. An attractive album of photographs of the event, autographed by the president of the club, Mayor Swarthout, Association of Commerce officials and others, was sent to the Colonel.

A feature of the Lindbergh coach was the attire of the car operator, who will be known as "pilot" instead of chauffeur. He wore for this occasion the regulation one-piece flying uniform with goggles and helmet, in keeping with the atmosphere of the coach.

The new coach, harmonizing with the quality of the company's new rolling stock, is made unusually attractive by the outside decorations, which include the name of Colonel Lindbergh, the flying insignia with American shield and star signifying a senior aviator. The panels are illuminated with artistic reproductions of Lindbergh's famous airplane, "Spirit of St. Louis." An unusual but very appropriate decoration was an 8-ft. airplane propeller that graced the front of the car. Small models of airplanes with revolving propellers, donated by the Grand Rapids Airport organization, were placed in front on the roof, and American flags at the rear.

Within the coach the bulletin board contains an artistic crayon drawing of the Colonel in flying regalia. Above the picture is the inscription: "This car is sponsored and dedicated to Colonel Charles A. Lindbergh by the Grand Rapids Flying Club."

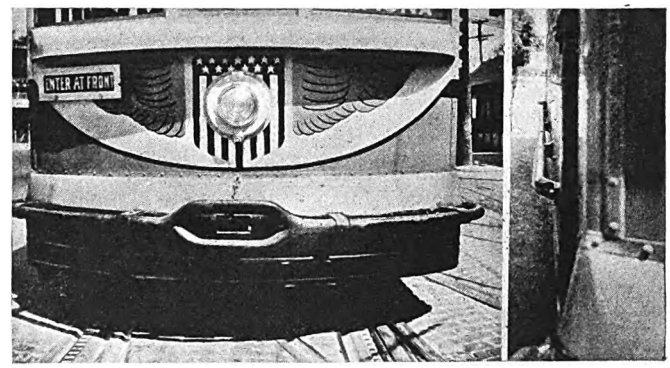
The car is painted in desert sand color, trimmed in red and black, with lettering in gold. The seats are an innovation, being round-top reed, upholstered with leather, with air cushions. Bulletins will be posted daily in the car by the Flying Club on matters pertaining to local and national aviation events. This and the continued operation of the Lindbergh car should tend to hold the kindly interest of air fans and their very active organization in the railway company.

* * * *

Side and End Car Bumpers in Grand Rapids

REALIZING that more automobiles collide with street cars than street cars with automobiles, the Grand Rapids Railroad has equipped its cars with bumpers as a protective measure. This has eliminated to a large extent the marring and scratching of car bodies, has prolonged the life of the paint job and at the same time has been worked out so that the bumpers have added to the attractiveness of the car by keeping the panels free from dents.

On the latest cars remodeled in the company shops a bumper has been placed the entire length of the car body, attached to the side panel at the sill line. This protects against sidewipes. It is made of steel tubing, the ends of the tubing being upset and swedged to a flat surface for bolting to the body. The bumpers are painted black and form a part of the attractive paint scheme.



The Grand Rapids company is experimenting with the tubular end and side bumpers shown above

Front and rear bumpers are made of spring steel of a weight and size to conform with the weight and size of the car and are bent to shape to conform to the dash of the car and project from the dash approximately 6 in. so that the entire force of collision is taken up by the bumper. Horizontal bars of the bumpers are so arranged that there is no interference with the drawbar pocket and the drawbar slips in between two horizontal leaves of the bumper. Views of these bumpers are shown in the car views in the preceding pages. The company has also been experimenting with a tubular front bumper. It has been attached to the Colonel Lindbergh car as illustrated herewith. It has been found that the saving made in repairs due to collisions has more than offset the cost and installation of these bumpers.

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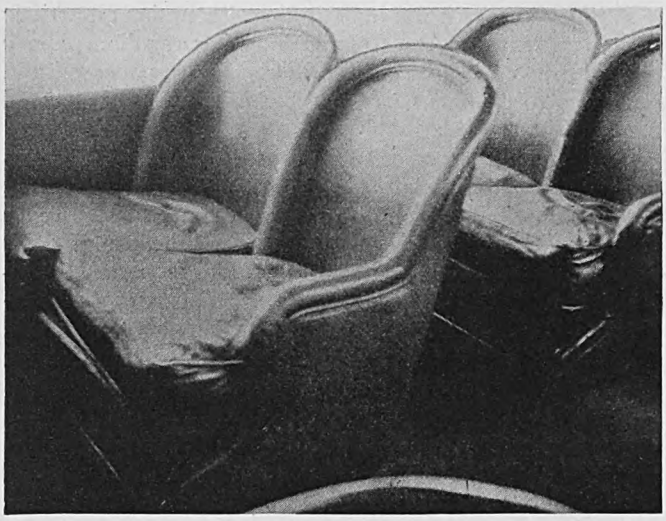
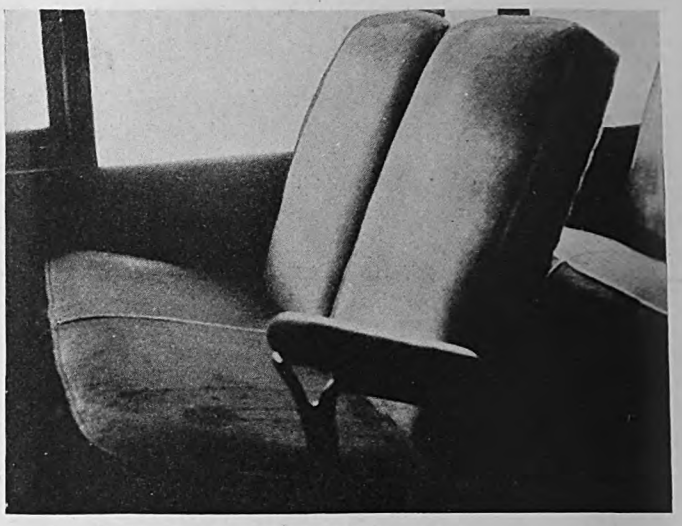
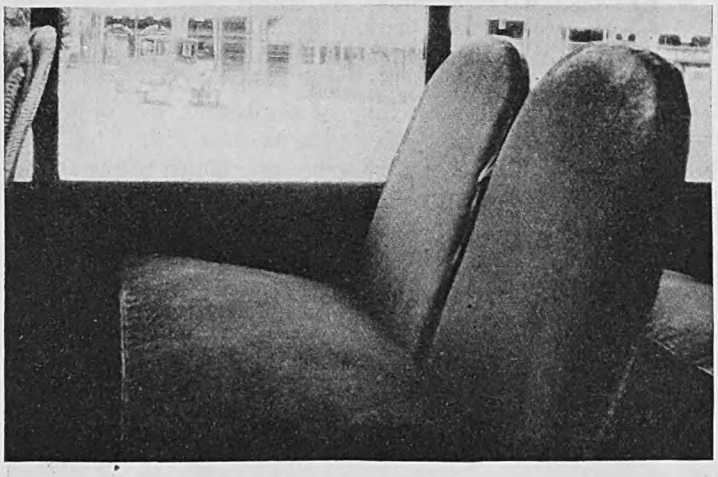


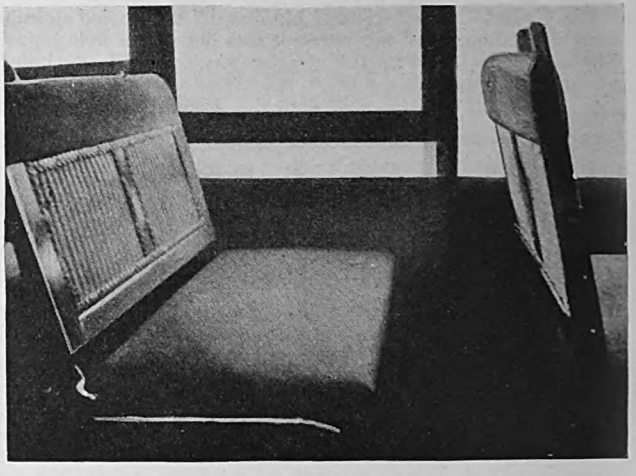
Deep-cushioned, rounded-back leather seat



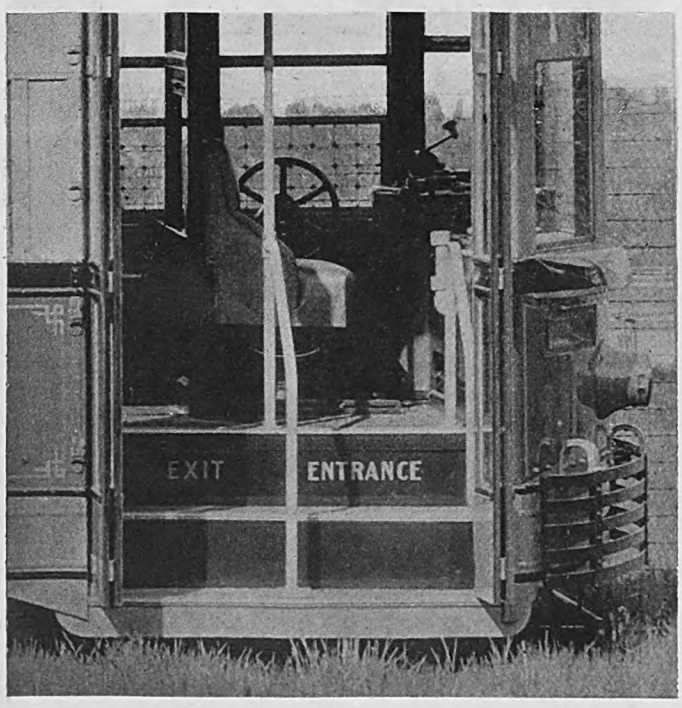
Pullman type plush seat



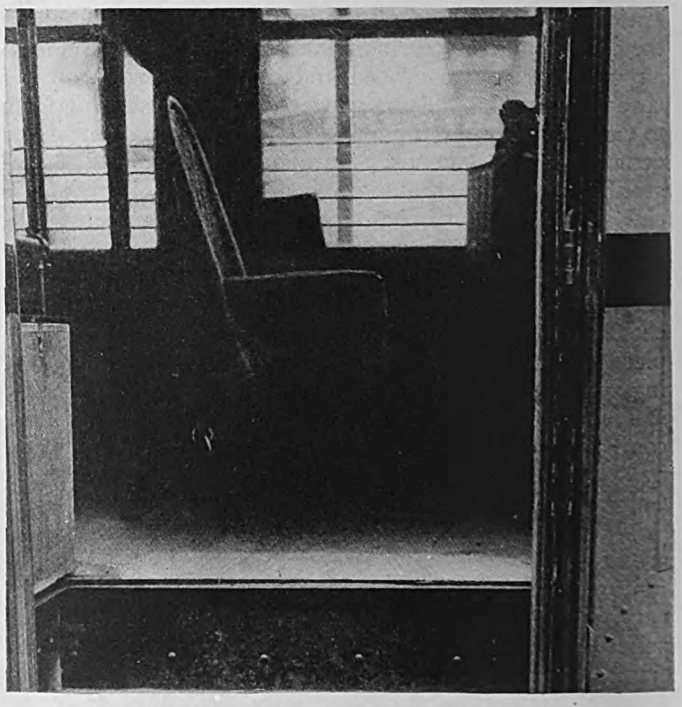
Two-paneled upholstered seat with deep seat cushion and enameled reed back



Upholstered reversible seat with reed-paneled back made over from old type Birney seat



Deep-cushioned adjustable seat for operator, showing also the easy entrance and exit of car



Cushioned, upholstered reed adjustable seat for operator on remodeled Birney cars

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Seats for the Passenger and Operator

IT IS said that the average man spends at least a third of his life in bed. Whether this is correct or not, every passenger on an electric railway, except during rush hours, spends practically all of his time in a seat. Hence, the comfort of the seat which he occupies is a large factor of the opinion formed by him of the service.

The Grand Rapids Railroad, which has been very successful in other ways in winning popular support, believes it would overlook an important business-getting feature if it did not pay especial attention to the character of the seats which it offers the riding public.

On its cars it has been experimenting with, and has developed, four different kinds of passenger seats for different types of cars. They are respectively the deep-cushioned, rounded-back leather seat, the Pullman type plush seat, the two-paneled upholstered seat with deep seat cushion and enameled reed back and the upholstered reversible seat with reed-paneled back made over from the old seat.

The company also believes that its car operators should be provided with comfortable seats, and for them it has developed two types—one is a deep-cushioned adjustable seat. The other, a cushioned, upholstered reed adjustable seat, is designed for the operator on a remodeled Birney car. All of these different types of seats are illustrated on the opposite page.

* * * *

Operating Costs Reduced at Grand Rapids

THE fact that the new rail coaches at Grand Rapids have been a major influence in the accomplishment there lends added interest to the company's expense accounts. The figures for the four principal accounts for the fiscal years ended May 31, 1927 and 1926, are given in Table I and show that there was a decrease in 1927 from 1926 in all four accounts, namely, way and structures, equipment, power and conducting transportation, although there was an increase in car-miles operated. The per cent reduction in way and structures expense was 10.72 per cent. While this can hardly be attributed wholly to the operation of the lighter cars, because it followed so quickly after their introduction, undoubtedly they produced less wear and tear on the tracks. The greater part of this reduction was undoubtedly caused by the extensive reconstruction of the track undertaken a short time previously, a reconstruction involving more than 20 per cent of the system.

TABLE I—FOUR PRINCIPAL EXPENSE ACCOUNTS FOR YEAR ENDED MAY 31, GRAND RAPIDS RAILROAD

	1927	1926	Decrease
Way and structures	$85,006	$95,218	$10,212
Equipment	119,210	176,896	57,686
Power	162,980	172,359	9,379
Conducting transportation	320,157	363,848	43,691
Total of four accounts	$687,353	$808,321	$120,968
Car-miles operated	3,745,031	3,675,090	*69,941

*Increase.

The percentage reduction in equipment expense was 32.61 and was brought about very largely by the operation of the new coaches, which allowed the retirement of the old equipment that was costly to maintain. At the same time the pull-ins for the year fell off 52.11 per cent. Practically, the change allowed the company to reduce the working force in its car shops from 56 to 39 men, and later to shorten the working day from nine to eight hours without increased compensation. It will be noted that the saving in the equipment account, $56,686, is larger than in any of the other primary accounts.

The reduction in power expense amounted to $9,379, or a decrease of 5.86 per cent, and a corresponding reduction in consumption of 687,486 kw.-hr. This is the total amount of electrical energy purchased for all uses, including car propulsion, car heating, air compressors, lighting, shop power and track tools. In a sense it is more noteworthy than appears on its face, because the new electric coaches are electrically heated, while the cars which they replaced were heated with coal. The saving was also made in the face of the additional car-miles operated, as mentioned above. The kilowatt-hours used during 1926 were 3.36 per car-mile, whereas in 1927 they were 3.11 per car-mile.

The reduction in conducting transportation accounts was $43,691, or 13.65 per cent. This reduction was largely accomplished through the inauguration of the new coaches, which are one-man operated, though of practically the same seating capacity as the old two-man cars replaced.

Table II shows the income statement for the past six years.

TABLE II—INCOME STATEMENT FOR SIX-YEAR PERIOD FOR YEAR ENDED MAY 31, GRAND RAPIDS RAILROAD

	1922	1923	1924	1925	1926	1927
Passenger earnings	$1,798,898	$1,825,185	$1,742,796	$1,682,199	$1,710,633	$1,710,126
Other earnings	46,061	53,596	63,031	50,017	39,643	47,220
Total gross earnings	$1,844,960	$1,878,782	$1,805,827	$1,732,217	$1,750,277	$1,757,347
Operating expenses	1,187,810	1,189,614	1,114,465	1,126,733	1,163,691	1,048,740
Gross income	$657,149	$689,167	$691,362	$605,483	$586,585	$708,606
Taxes	138,544	135,204	137,811	131,419	147,170	149,014
Gross income after taxes	$518,605	$553,962	$553,550	$474,064	$439,415	$559,592
Fixed Charges:						
Bond interest	$224,000	$222,166	$232,608	$271,357	$265,474	$258,135
Other interest	31,512	26,666	30,715	37,484	41,404	60,845
Depreciation	193,821	171,848	161,527	152,313	168,047	175,099
Amortization of bond discount and expense	78,436	78,009	79,392	18,439	19,021	17,037
Bridge sinking fund	1,152	96	.....	.....	.....	.....
Total fixed charges	$528,922	$498,787	$509,244	$479,595	$493,946	$511,117
Net available for dividends	*$10,317	$55,174	$44,305	* $5,530	*$54,531	$48,474
Revenue passengers carried	24,495,587	24,138,107	21,993,359	19,267,331	19,435,873	19,347,835
Car-miles operated	3,946,702	3,958,371	3,826,643	3,621,293	3,675,090	3,745,031

*Deficit.

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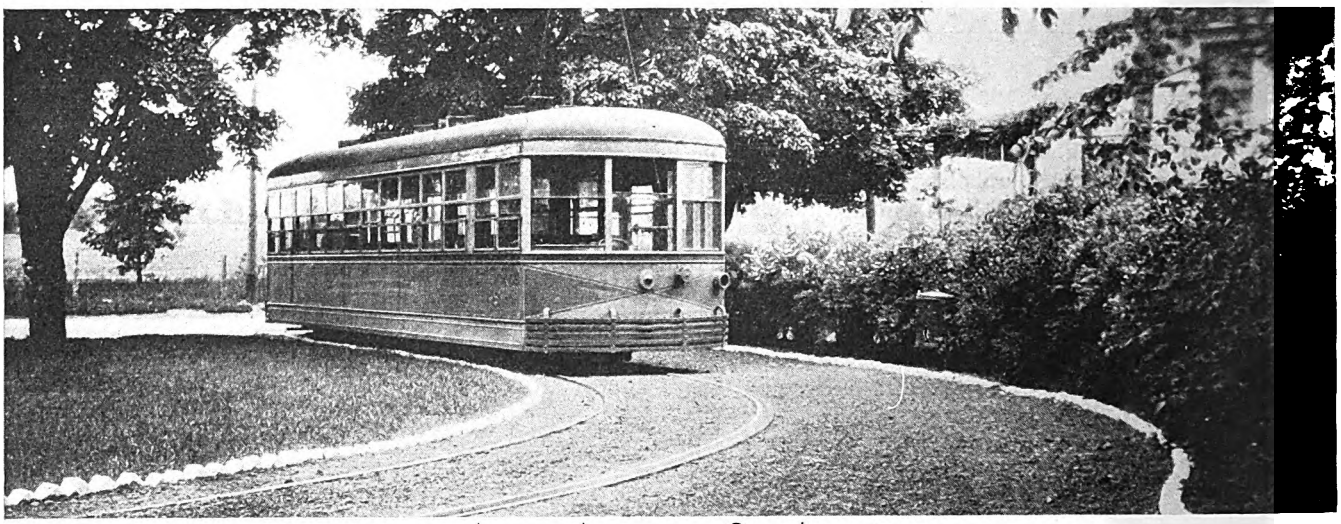
Winning Popular Approval in Many Ways

The Grand Rapids Railway embraces every opportunity to improve its service and to make it more popular with its riding public



Loops for turning cars at the ends of routes are beautified by tasteful treatment

OTHER articles in this issue tell of the major points in the public service policy of the Grand Rapids Railroad, but no opportunity was overlooked by the company to improve its service and make it more popular. Brief accounts of some of these methods will be given.

Painting Cars to Attract Passengers

With the introduction of the new electric rail coaches came the realization that pleasing color combinations on street cars offer an attraction that is conducive to increased good will and increased desire to ride. The idea, born in Grand Rapids, was used as an experiment to determine what the reaction of the public would be. Harmonious color combinations, public and parochial school pennants in their proper colors, also Boy Scout and Camp Fire Girls' insignias, truthfully reproduced, were introduced on the new coaches and gradually extended to many of the older cars on various lines.

Stores Sell Street Car Checks

Co-operating with store owners to accommodate their patrons, at the same time increasing the car riding revenues, the railway company has established stations for the sale of street car checks in the leading downtown department stores and in drug stores and business places in many parts of the city. This convenience to the public has not only been appreciated but has been mentioned in the advertisements of many stores because of its shopping and trade value.

Believing that a direct advertising contact with hotel guests would encourage street car riding as against taxi patronage, the railway management has followed such a plan for several months. Through arrangement with the hotels, a trustworthy employee was detailed to slip under the door of each guest's room each night an attractive cardboard folder. It is of pocket size so that it may be carried for reference or mailed to friends soon to visit the city. The front page of the folder bore the cheery greeting "Good Morning!" and beneath it a halftone picture of one of the new rail coaches. Beneath this a caption read: "Grand Rapids, the Furniture Capital of America, Welcomes You." The second page contained a map of Grand Rapids, showing the company's lines. The third page bore a message about the service given by the company and asking the guest to patronize it.

The back page carried a list of those places of interest, depots, factories, etc., such as a hotel guest would likely be interested in and can be reached by the street cars.

"Welcome" Cards for Delegates

Small-sized, attractively printed "welcome" cards are issued to delegates upon their arrival in the city to attend conventions, field days, touring parties, etc., where the number of persons would make it worth while.

These cards welcome the visitors to Grand Rapids and then add: "The Grand Rapids Railway takes pleasure in placing its service and its amusement park (if in the summer) at your disposal for your 1927 convention (field day, outing, etc.). We sincerely hope you (and your wife, families or friends) will have a most enjoyable visit (session, outing, meeting, etc.)."

Letters are also sent to persons taking up residence for the first time in Grand Rapids. The newcomers may be in the midst of getting their new home settled, or may have it just established, when the mail brings them a

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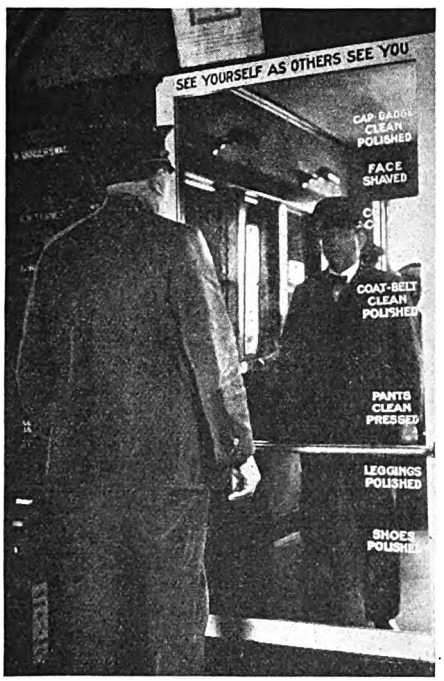
message from the street railway company welcoming them to the city, and in a sincere way inviting them to ride the street cars to work, to school, or shopping, etc., telling them the line nearest their home. Often it is the first letter received by them and it produces a favorable reaction. Usually the recipients do not understand how the company could learn of their arrival so soon. The key to the secret is that the moving van companies supply the information that makes the letter a success. Along the same lines a letter is also mailed to residents who change their street address, calling attention to the street car service nearest their new residence location.

Porter Service for Street Cars

To maintain a high standard of car cleanliness, a special car porter has been stationed at a downtown central point on the system. He boards the cars and passes through them, picking up refuse left by passengers, wiping dust from seats and window sills, cleaning ashes off the floor in the smoking compartment, etc. He does this while the car continues on its way and, when through, leaves the car and boards a returning car, which he cleans before arriving at the central point. In this manner practically all the cars receive special attention once or twice daily. This sort of secondary cleaning was formerly done at the ends of car lines, but the passengers did not know it. By having it done in the center of the city, where passengers see it, the company gets credit for the special effort which it is making. Furthermore, it employs the time of the porter more effectively, since practically all cars pass the point at which he is stationed.



Mirror provided at each carhouse to induce car operators to maintain a neat appearance

Training Employees in Salesmanship

That its service may meet the modern demand, the Grand Rapids Railroad has established a school for the education of its operators along the lines of safe, courteous, efficient service and salesmanship. The instructors are division superintendents. The curriculum includes good operation, safety, personal service, personal comforts, passenger friendliness, general public responsiveness.

The operators' views are taken and discussed. The operators are questioned regarding all phases of their work, their responsibilities and trying incidents that test their courtesy or the service, and an effort is made thoroughly to educate them to meet every situation that may confront them. They are asked difficult questions, such as might come from passengers. If their answers are not favorable, proper instruction is given.

The objective sought is so to train these men that they will not be bound by a set of iron-clad rules, but rather will be fortified for any emergency, any situation, any problem, any question or any phase of the service where only good judgment and thoughfulness could meet the situation.

After passing through this course, although the operator's viewpoint has changed in many cases, he has been unconsciously educated to a better understanding of his work, salesmanship and responsibility.

Other Means of Winning the Public

At certain times the railway company has written letters calling attention to the safety and economical features of its service to owners of automobiles that were found on different days parked in or near the business districts. The letters invited the autoists to use the street car service, the invitations being worded in such a way that no resentment could be, or has been felt, by the autoist.

The company has always paid great attention to maintaining the attractiveness and cleanliness of its properties, especially those which are conspicuous, like loops. An accompanying view shows the manner in which loops are being beautified.

A new uniform of the "chauffeur" style was adopted in 1924 for the company's platform men. It is a two-piece olive drab suit with breeches and puttees and a business-like touch. In the car, chauffeur nameplates identify the operators and conductors. A full-length mirror in each carhouse helps the car operators to maintain a neat appearance.

A bulletin board at the front of each city car permits different civic associations to post notices of events of city-wide interest.

A young man in neat railway uniform is stationed at a central loading and transfer point to answer all general questions, give directions, and sell car tickets. His uniform has the words "Ask Me" embroidered on the sleeve.

The old longitudinal rattan car seats which were removed from the cars to make room for more modern types were presented to the Fire Department. They have made comfortable benches at the various fire stations.

Where the street width permits, permanent loading platforms have been erected. Where the streets have been too narrow for this, portable zones have been established by means of pipe and chain railings placed in sockets inserted in the pavements. After the evening rush-hour period these railings are removed.

A full uniform is presented to each operator who has a record for the year of no preventable accident during this period. Last year 85 awards of this kind were made.

Employees and their families receive free admission, by passes, on weekday afternoons to the theater at Ramona Park, which is operated by the company.

Suggestion boxes are maintained, at which any employee may drop a written suggestion or idea for the improvement of the service. Each month a special committee reviews these suggestions, and cash prizes are awarded for the best ideas that can be adopted.

Six or more employees, usually car operators, are invited to attend each of the monthly department head meetings. These invitations are divided equally among union and association men and are rotated among the employees generally.

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Rebus Contest as a Business Getter

Grand Rapids Railroad offers prizes for successful solutions of puzzles based on the names of its cars

More than 10,000 persons came down town to view the exhibit of the Grand Rapids rebus contest the first day it was opened

DURING April of this year, while the car-riding patronage was showing a decrease, the Grand Rapids Railroad announced a street-car name rebus contest which ran from May 1 to May 30. The company has 76 cars with names. Of this number 27 were chosen and expressed in rebus sketches. A sheet with these sketches numbered and with the conditions of the contest was distributed in the cars. Any one in Grand Rapids except employees of the company was eligible to compete. Persons were asked to familiarize themselves with the names of the cars, then study each of the 27 sketches and decide the name represented by each sketch. The prizes offered were, first, $25; second, $15; third, $10; fourth, $5, and forty-five prizes of $1 each. Three prominent citizens of Grand Rapids were named as judges.

Figures on passengers carried during the month indicated the contest stimulated riding besides popularizing the service. More than 60,000 rebus folders were taken from the cars and more than 2,000 answers received. One of the outstanding good-will and patronage features of the rebus contest was that every person who sent in an answer received a card of single admission to Ramona Park, good any time during the summer season. Recipients were notified of this "prize" and had to come to the company office to get it. This meant riding. Then, the single admission tickets probably brought increased patronage in both car riding to and from the park and in tickets for friends, because people seeking amusement do not go alone.

From the good-will building standpoint, the contest was perhaps even more important than as a revenue producer. The answers were submitted in all manner of forms, some very elaborate. But all through the 2,000 answers there came back to the company many of its advertising and public relations work expressions, reflections of its efforts to improve service and of the problems on which it had sought public understanding. The contest was a revelation in its proof that these efforts of the company had really made their impression.

Letters from Grand Rapids residents traveling in many states were received by mail, showing the folders were taken from the boxes before the residents departed from the city and were worked out while en route. Many patients in public and private hospitals and in homes wrote in thanking the company for the comfort and enjoyment they had found in working the rebus.

All answers, the rules required, had to be filed at the company's information office, or mailed. While one would suspect the preponderance of answers would be by mail, such was not the case, the office contact with the public being far beyond the company's expectations. Entire classes and rooms in different schools worked the rebus, sent a chairman to file it, and with it a letter of explanation.

After the prizes were awarded a central location was procured for prize distribution and there was an exhibition of the more novel and attractive answers. It was opened to the public to continue for four days. The first day more than 10,000 persons viewed the display, while the total attendance for the four days was more than 20,000, by clicker check. This again brought patronage to the cars and had its effect in building favorable reaction toward the railway. In general, the contest effected its purpose, made the people think and talk street cars for more than 30 days during a period unusually favorable for motoring.

* * * *

Turning a Park into an Asset

An annual feature is Kiddies' Day, when prizes are given to the children and all amusements are half price

ONCE it was thought that a park was a necessary adjunct to practically every electric railway company, but the cost of keeping it up and providing the attractions has done much to change this point of view.

The Grand Rapids Railroad is one company that looks upon its park as an asset rather than a liability. This resort, known as Ramona Park, is situated on the shores of Reed's Lake, near the city and at the end of a car line. A large sign at the entrance states, "This resort is maintained by the Grand Rapids Railroad for our citizens and their friends." An exceptional feature is that the company operates a regular theater there, offering the best Keith-Albee New York acts—the only high grade attraction in the city during the summer.

A policy of "free gate" to the park is maintained and reacts in public good will and increased revenue through more riders.

By keeping definite control of the concessions and entertainment the company maintains a high class park at all times and has won public approval because unescorted women and children are safe there at any time. This condition is made possible by a trained and courteous staff.

This activity on the part of the company is highly appreciated, so much so that the Grand Rapids Furniture Manufacturers' Association subsidizes this theater during the July furniture market season.

Another feature of Ramona Park operation is an annual event there during the summer known as Kiddies' Day. In August, 1926, the second annual Kiddies' Day celebration was held at Ramona. It taxed the facilities of the railway company to care for the unexpected throngs. More than 30,000 children enjoyed the gala

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day arranged for their entertainment. Naturally many parents accompanied their children, with resultant benefit to street car revenues.

In first creating Kiddies' Day the railway management (though without thought of any profit) sought to have one day that the children could call all their own, when every child, rich or poor, of any race, creed or color, could have one day's outing at very small expense, for there are many in every city who do not ordinarily get these pleasures. Consequently, all amusement rides, theater admissions, etc., were made half price. The company, aided by concessionaires, gave away 100 valuable prizes, including a Ford, a pony, radio set, bicycle, dog, baseball suits and many other things the childish heart desires. In addition, 300,000 souvenirs furnished by department stores, banks and other establishments were distributed. Every child received a store of cherished things as tokens of the occasion.

Because of the public confidence, good will and patronage Ramona Park annually returns a profit to the company and certainly creates more riders.

* * * *

Short Notes on Big Events

A summary of some of the events not previously mentioned which helped the Grand Rapids Railroad to win the Coffin Prize this year

EVIDENCE of the rehabilitation of the Grand Rapids Railroad, financially and physically, does not rest on one event or a dozen, but on a great many—all of which cannot be recounted here for lack of space. Brief notes will be given of a few of the more important events not previously mentioned.

The litigation against the company for accidents has become almost negligible. Only three suits were begun against the company during the year ended May 31, 1927, and all were of a minor character. One was dismissed by the plaintiff, the second was compromised out of court for less than $50, and the third, involving about $85, is still pending. Part of this satisfactory condition is due to the great care exercised in operation, part to the reputation the company has for fairness in adjusting claims, and part to its endeavor where liability exists to handle the matter outside the court.

Since the disastrous fire which destroyed its carhouse with many cars all carhouse employees are drilled in fire protection under the instruction of the City Fire Department.

Service at Cost Favored by Civic Bodies

In February, 1927, the Civic Round Table, composed of delegates from representative civic bodies, improvement associations, etc., passed a resolution to the effect that as the company was then on a service-at-cost basis it would be desirable to have it relieved from paving charges. This resolution was sent to the City Commission, which arranged to have an amendment to the City Charter to carry this resolution into effect submitted to the voters on March 7. Indorsements of the proposed amendment were passed by a very large number of trade and other civic organizations in Grand Rapids. Even a competitor in the transportation field, the principal local taxicab company, urged passage of the amendment. Unfortunately, the vote on March 7 was unfavorable. This may have been due to the fact that another amendment, providing for a 2-mill tax on all real property, was on the same ballot and the public thought they were dependent to some extent on each other or it may have been due partly to the inclement weather which kept many voters from the polls, or partly to the shortness of the campaign which did not give an opportunity for all voters thoroughly to understand the question. However, of the total vote of 8,565, the number cast in favor of the plan was 3,375, while only 4,190 were against the

An idea can be gained from this picture of the crowd of children assembled on Kiddies' Day at Ramona Park, Grand Rapids

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measure. The other amendment was defeated by a vote of nearly two to one.

In November, 1926, the Grand Rapids Association of Commerce, later supported by the City Commission and other representative associations, nominated Mr. DeLamarter, vice-president and general manager of the company, as the candidate from Grand Rapids for the Harmon Foundation gold medal and $1,000 prize. This is an annual award to the individual, who, in the opinion of the judges, has been responsible during the year "for the creation, introduction or development of a distinctive contribution to the social, civic, or industrial welfare." In its letter to the foundation, making this nomination, the Association of Commerce emphasized the benefit to the city brought by the rehabilitation of the railway property. The nomination was indorsed by the two leading newspapers, many civic clubs and prominent citizens.

Equipment Improvements

In its equipment the company has made a number of improvements besides those already mentioned in this issue.

It has established a maintenance cost system by which small leaks in operating expenses are detected.

It has equipped two cars with roller bearings and has kept a careful record of energy consumption from meter readings and of their lubricating and inspection costs. The test has not been carried over a long enough period to quote definite results, though up to the time that the brief was submitted the lubricating and inspection costs for the roller bearings per month were much less than for the plain bearings. Tests are also being conducted with one car equipped with band brakes.

Maps of the company's property and tracks have been prepared, drawn to a scale of 50 ft. to the inch. The track drawings show location of all poles, curb lines, tracks and paving, history of track, type of joints, etc. The plan is considered very much worth while.

Relations with Employees

The improvement in the company's equipment has been coincident with that of improvement in relations with its employees.

Suggestions as to betterments of the service are solicited from employees, and cash prizes are awarded for the best ideas adopted.

A company publication, the *Token*, is issued for circulation among the employees to encourage good public relations, increase courtesy to the public, teach tolerance, increase efficiency, and create a greater fellowship between departments. A leaflet, *Trolley Topics*, is issued monthly for circulation among the public through car boxes. Since June 1, 1926, every employee has had the benefit of free life insurance, under a group plan.

Large Book of Clippings

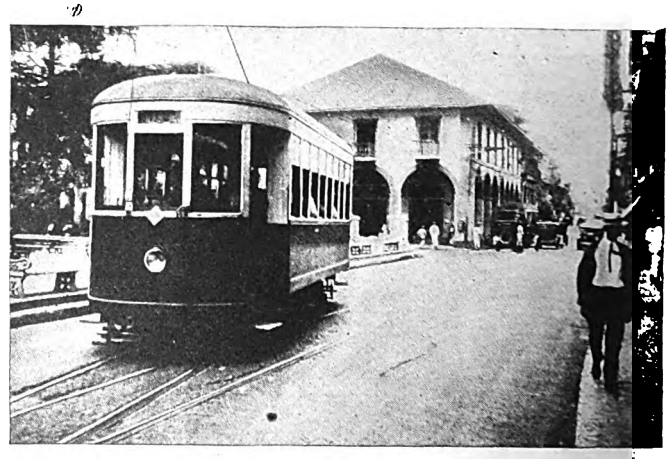
A part of the evidence submitted by the Grand Rapids Railroad to the Charles A. Coffin Prize Committee consisted of a large book of many hundred pages in which clippings referring to the company had been pasted. The publications represented were of all kinds and from all parts of the country.

Caribbean Tramways Prosper

Narrow streets introduce serious problems, but there are compensating advantages, one of which is there is little automobile parking

ELECTRIC railway systems in the countries bordering on the Caribbean Sea are of smaller size than those in cities of equal population in the United States, but the traffic on their lines is comparatively heavy. In Havana, Cuba, the largest city in this area, local transportation is furnished by the Havana Electric Railway, Light & Power Company. The population of the city is slightly more than 400,000. The railway has more than 100 miles of standard gage track in the city and neighboring communities. A total of 590 cars are owned, of which 524 are required for regular operation. On account of the narrow streets and sharp curves, all the cars are of single-truck design. Double trolley wire is used at present, but plans are under consideration for changing to single wire. The fare is only 5 cents, but much of the riding is short-haul and the company is prosperous.

At Camaguey, a city of about 100,000 population, and at Santiago, which is somewhat smaller, the railways are under the same management as at Havana. The Camaguey Tramway operates 22 motor passenger cars on 10.5 miles of track, while the Santiago Electric Light & Traction Company operates 30 cars on 9 miles of track. The fare is 5 cents. Like that in Havana, the track is standard gage, but in contrast to the Cuban metropolis, the overhead system is single trolley wire.



Left-hand operation is a characteristic of electric railway service at Kingston, Jamaica

All cars on these three properties are of the two-man type.

Throughout Cuba the weather is so humid during the rainy season that particular attention must be paid to the wood work in car bodies. Duralumin screws have been found more satisfactory than brass. Outside body joints are first covered with canvas soaked in white lead and a finishing strip of wood is then screwed on over the

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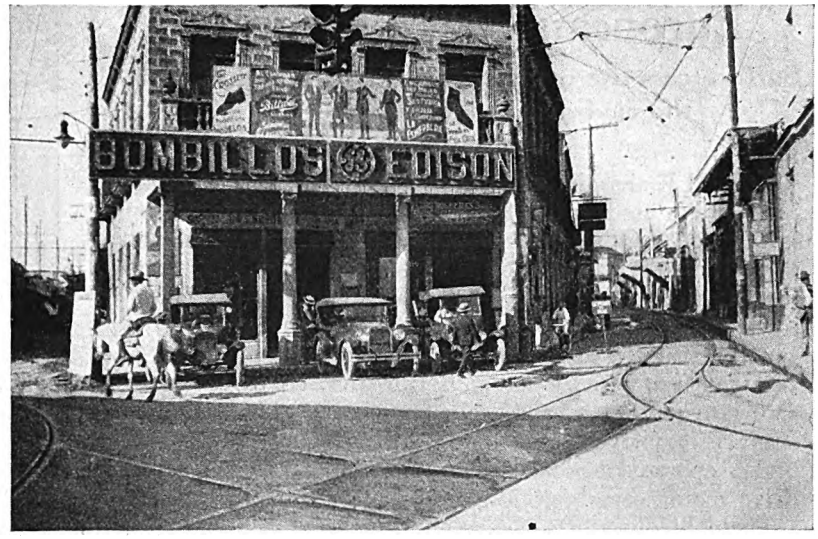
Narrow streets and double overhead trolley are characteristics of electric railway operation in Havana

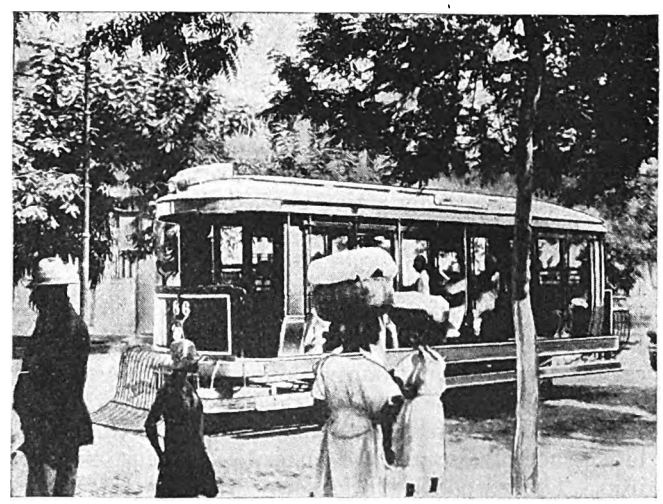


Crooked and narrow streets are numerous at Camaguey and require complicated special trackwork at intersections

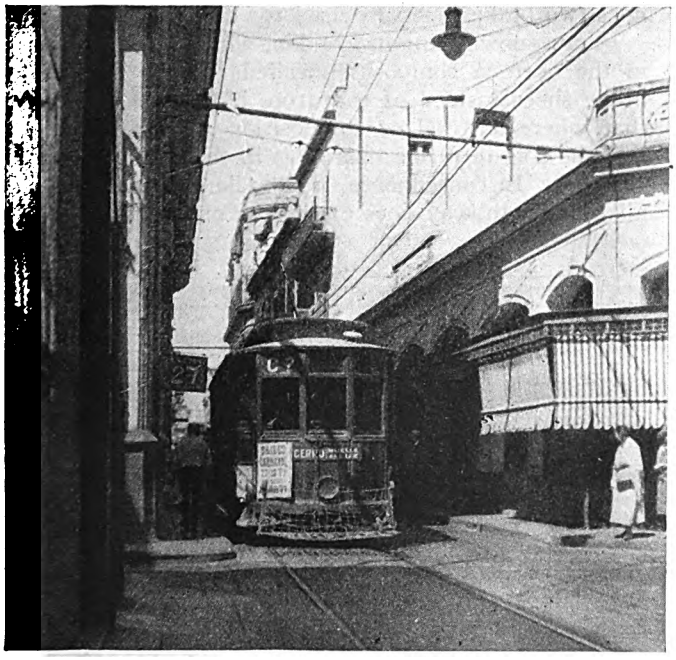
canvas. Double belt rails are used to protect the sides of the cars and the window posts from damage in the narrow streets. One belt rail is immediately below the windows, while the other is at the bottom of the side panel.

Kingston, Jamaica, is a city of about 65,000 population. Transportation is furnished by the Jamaica Public Service Company. This company operates 39 motor passenger cars on 26.6 miles of standard-gage track. As in England and some other British possessions, left-hand operation is the rule. This company also does a general lighting business.

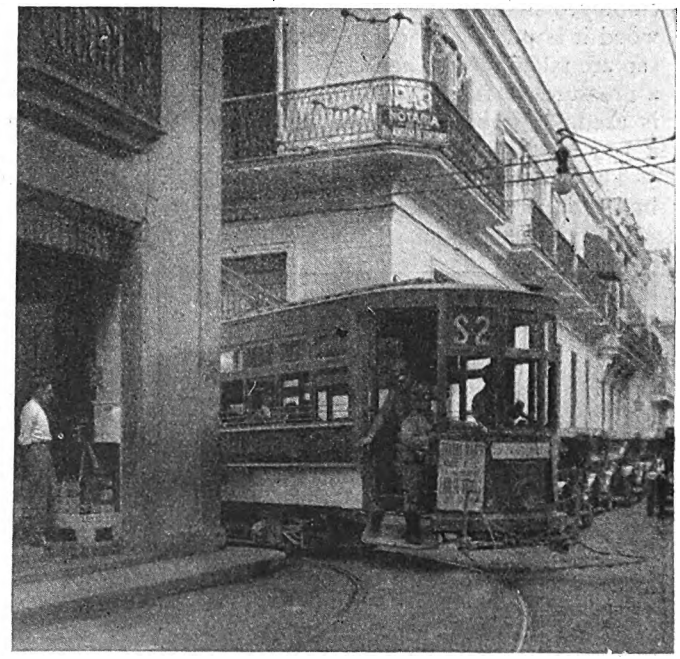
In contrast to the other railways in this territory the Panama Electric Company's track in Panama City is 3 ft. 6 in. gage. Transportation is furnished to a population of 76,000 by 22 cars operated on 11.4 miles of track. This service is supplemented by two buses operated on 1.5 miles of route.



At Panama City the track gage is only 3 ft. 6 in.



At Camaguey the local electric railway uses single overhead trolley wire. Span wires are often attached to buildings in these narrow streets



Single-truck cars are used in Havana on account of the narrow streets and sharp curves. Double belt rails protect the car body from damage by sidewipe

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European Brake Practice

Surface cars use many types of power brakes, but the air brake is standard on rapid transit lines

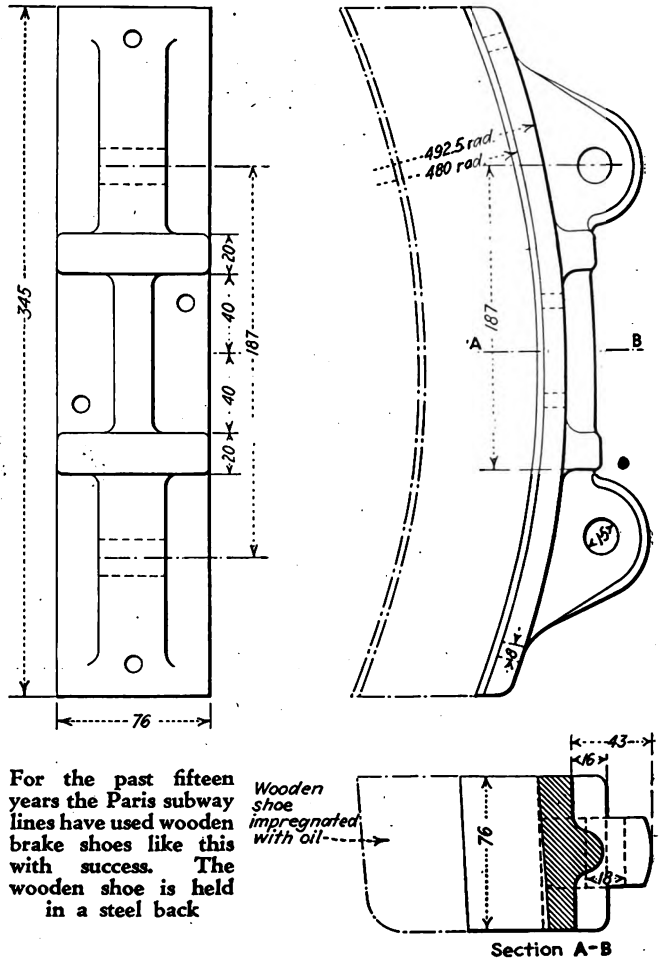
WHILE the air brake is practically the only power brake used in this country, this is by no means so in Europe. Other brakes whose use is very popular abroad are the various forms of electric brakes, such as the short-circuiting brake, solenoid brake and magnetic track brake. In Berlin electric brakes are so greatly favored that the air brake has been abandoned for surface car use. In the latest Berlin cars, equipped with spur gear motors, a band brake mounted on the armature shaft is employed. The trail cars use an axle disk brake, operated by hand or a solenoid. In the Cardan drive motor cars braking action is on the motor shaft.

Undoubtedly where the motors are used for braking cars, as with the short-circuiting brake and the magnetic track brake where current is taken from the motors, a greater load is put on them than where they are used for propulsion only, as in the United States. But this extra duty seems to have been considered when the capacity of the motors was chosen and burnouts do not appear to be more frequent abroad than here.

In London, where the magnetic track brake is used extensively, the track shoe is attached to the brake lever system, so that when the brakes are applied the track shoe stops the car by acting against the head of the rail and also by setting the wheel brake shoes. As the current to operate this brake is taken from the motors, action ceases, of course, when the car stops moving. Hence, at stops, the car is held at rest by the hand brake. Four magnetic track shoes are used on each double-truck car of the London County Council Tramways.

Air brakes are used on the rapid transit lines of Paris, London, Hamburg and Berlin, but sometimes wood brake-shoe blocks are used instead of the customary cast iron. These wooden blocks seem to give good results on lines which do not have to run in the open. In Paris, where such shoes are used very extensively, the wood employed is beechwood. After the shoe is cut from the wood it is put in a vacuum chamber, where all juice and sap are taken out. Then it is impregnated with oil under a pressure of from two to three atmospheres. Olive oil is used. Originally linseed oil was employed, but gave a bad smell when it became heated in train operation.

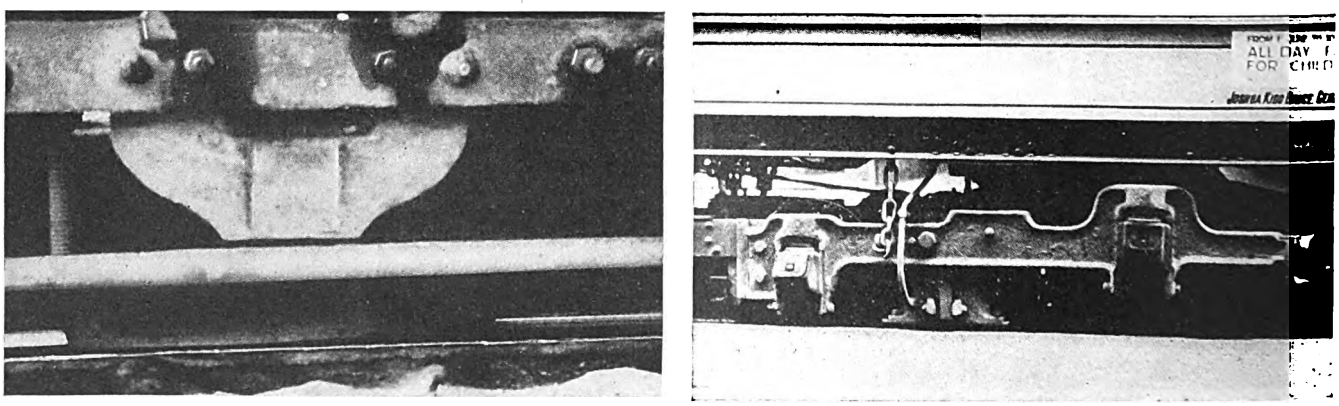
The wooden shoe is held in a cast steel back, as shown in the illustration, being attached to it by four screws which pass through the steel back into the wood. All dimensions shown in the engraving are in millimeters.



For the past fifteen years the Paris subway lines have used wooden brake shoes like this with success. The wooden shoe is held in a steel back

The life of a wooden brake shoe under Paris conditions is about 30,000 km. (19,000 miles), whereas with cast iron the life is only about one-third this mileage. The wear is from abrasion of the material and not from burning. On all recent trucks on the Paris underground lines two brake shoes are used for each wheel.

In one subway line in London, which does not operate in the open, a composition called ferrodo is used for brake shoes instead of cast iron, but it has been found that where a wood or composition shoe is exposed to moisture, as in a line operating in the open, it becomes slippery. In consequence, iron brake shoes are used on all London subway lines except the one mentioned.



Magnetic brake shoes as employed on the Naples Municipal lines (left) and London County Council Tramways (right). In the Naples view the shoe is partly hidden by the side rod connecting the body posts on this single truck

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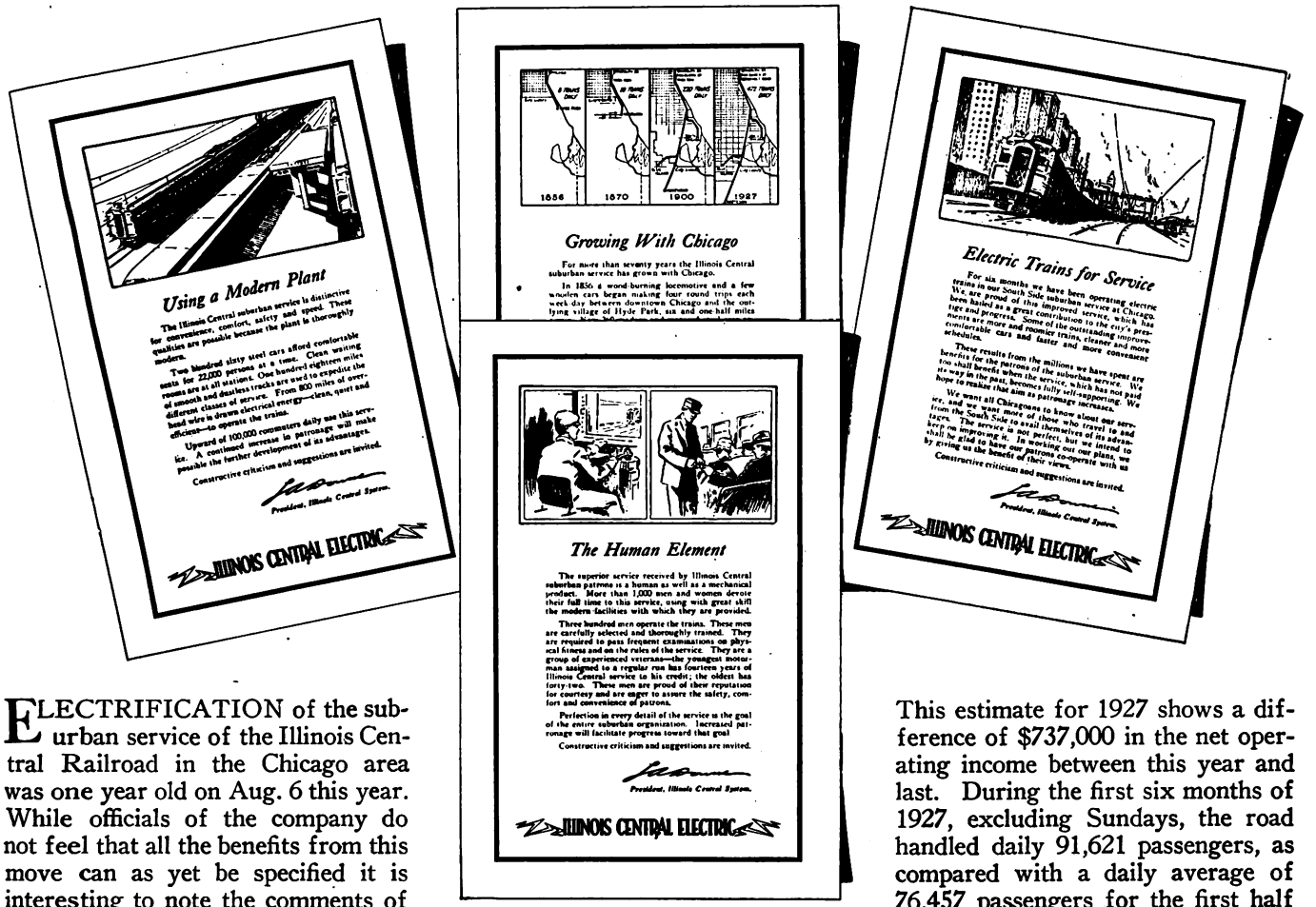
Electrification Brings Profit to Illinois Central



Some of the reasons for increased patronage on the Illinois Central suburban electrified service by Chicago commuters

ELECTRIFICATION of the suburban service of the Illinois Central Railroad in the Chicago area was one year old on Aug. 6 this year. While officials of the company do not feel that all the benefits from this move can as yet be specified it is interesting to note the comments of President E. L. Downs, as given out in a recent interview with Oscar Hewitt of the Chicago *Tribune*. Mr. Downs said:

Despite a considerable increase in investment, the increase in patronage has combined with a decrease in operating expenses to produce an improved earning situation. The operating deficit, which was a feature of this suburban service prior to its electrification, is being slowly but surely reduced, and there is reason to believe that if the present favorable condition continues—particularly that part of it having to do with the important factor, increased patronage—the service will eventually become a paying proposition.

Present investment carried on the books chargeable to operation of this service totals $23,500,000. Of this amount $10,000,000 is represented by rolling equipment and $13,500,000 by other facilities.

Among other things commented upon by Mr. Downs as factors that have brought about an increase in patronage under electrification are: Running time of suburban trains has been reduced on an average of 15 to 25 per cent as compared with the old steam schedules. The last steam time-table listed 406 trains serving the south side, as compared to 450 trains listed on the time-table of the first electrification operation. On June 26 last this number had increased to 485 trains, and the present schedule of 542 trains is an increase of 33½ per cent.

Suburban service on the Illinois Central during the year 1926 was mostly operated by steam at a deficit of $337,000. Under an exclusive electric operation the profit is estimated at $400,000. The company's net operating income for the first six months of this year was $241,000, which, as Mr. Hewitt comments, makes the estimate of $400,000 for the year a conservative one. This estimate for 1927 shows a difference of $737,000 in the net operating income between this year and last. During the first six months of 1927, excluding Sundays, the road handled daily 91,621 passengers, as compared with a daily average of 76,457 passengers for the first half of 1926, 77,074 for 1925, 77,533 in 1924, 73,393 in 1923, and 68,259 in 1922. There were 11,848,000 riders during the first half of last year, as compared to 15,108,000 this year, and this increase is attributed to speed, the average being 58 m.p.h. for the trains. The abolition of dust, smoke and cinders and the uncomfortable jolts occasioned by steam operation played their part, as does cleanliness, in making the new service popular.

According to President Downs, "the new schedule provides an express train in each direction every ten minutes throughout the day between Hyde Park and 67th Street inclusive, in addition to the special trains serving some of these stations. It gives an express train in each direction every twenty minutes throughout the day for stations on the South Chicago line, and between 72d Street and Kensington—115th Street and the main line. The new schedule also provides nineteen additional local trains daily between Randolph Street and Hyde Park."

As pointed out by Mr. Hewitt in his report, while no Illinois Central official will consent to be quoted, several of them both hope and expect that the electrified suburban service will carry 30,000,000 riders this year—an increase of more than 5,000,000 over last year.

On the anniversary of the electrification, the south siders staged a celebration in Washington Park Racetrack, to which there were more than 20,000 invitations sent out. Meanwhile, as shown in the accompanying illustrations, the road is selling its electrified service to commuters through attractive newspaper advertising.

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Rehabilitation Program of Norfolk Property

AS ANNOUNCED in a recent issue of this paper, the Norfolk Division of the Virginia Electric & Power Company is rehabilitating sixteen of its double-truck cars from two-man operation to one-man operation, at an approximate cost of $100,000. The work is being done at the company's shops under the direct supervision of T. W. Madison, master mechanic.

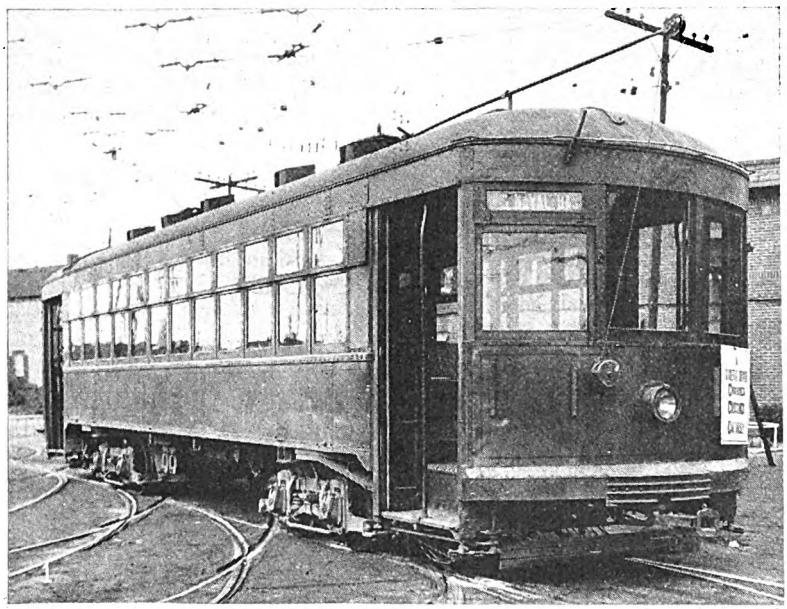
General details of the cars before converting are as follows:

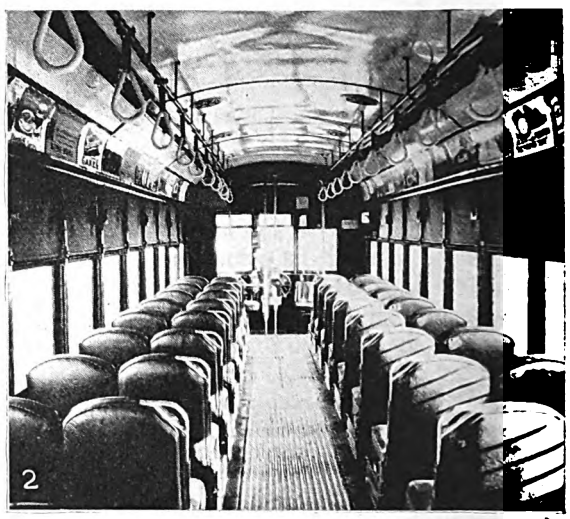
Length	45 ft. 10 in.
Width	8 ft. 6½ in.
Height, rail to trolley stand	11 ft. 3½ in.
Inside length	31 ft. 10½ in.
Inside height	8 ft. 3½ in.
Inside width	8 ft. 2 in.
Seating arrangement	Sixteen crosswise seats and four 5-ft. longitudinal seats, with a combined seating capacity of 54. Seats of wood framing with rattan centers
Type of body	Round top with U-shaped "T" iron posts. Entire body of steel with exception of floors and inside finish
Trucks	Brill 27G-1
Brake cylinders	Westinghouse 8-in.
Air compressor	General Electric CP-27
Motors	Four Westinghouse 514-C, gear ratio, 14:64
Controllers	K-35 G-2
Total weight of car	36,000 lb.

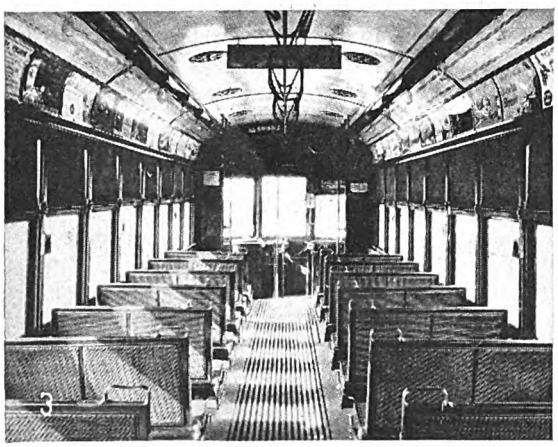
In order to reconstruct these cars for one-man operation, all modern safety car appliances are being installed, including a full set of pneumatic door controls, both front and rear, with a rear door treadle attachment. This necessitates the removal of the entire vestibule and platform, the only remaining part of the entire front being the hood. In rebuilding the old platforms, two side platform knees are being made from 9-in. channel iron bent into the proper shape. The two center platform knees are fashioned from 2¾-in. x 9-in. white oak, the crown sill of 2¾-in. white oak, bumper of 6-in. channels, corner and center vestibule posts of white oak, dasher of 14-gage steel, 36 in. high, and inside of vestibule below windows of 18-gage steel.

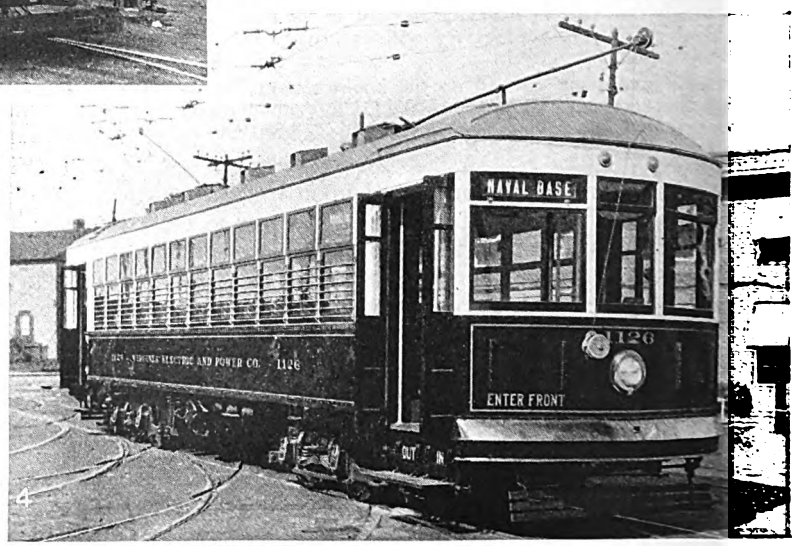
The right-hand doors are double folding with individual steps and control. The left-hand doors are folding, with treadle attachment, all doors opening outward. One special feature in the construction of the door-operating mechanism is that all piping is entirely concealed by the inside finish of the vestibule, thus making the job neat appearing.

The interior trim is of natural wood with a cherry red finish, while the exterior has a color scheme of red, white and blue. The lower part of the car bodies is in red enamel, the body above the sills in white and the roof,









1. Virginia Electric & Power Company's car before remodeling. These cars were purchased in 1917. Sixteen of the units are passing through the Norfolk shops.

2 and 3. Views showing the car interior before and after the changes. Individual type deep-cushioned seats replace the old bench type seats of the old car.

4. One of the rehabilitated cars of the Norfolk Division, Virginia Electric & Power Company. Compare its striking appearance with that of the old car

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trolley catchers, headlights and other trimmings in blue. Iron parts around the bottom are painted black, the trucks a dark red and striping and lettering are in imitation gold.

Each car has twenty double seats of the individual cushioned type, as shown in one of the illustrations, and a longitudinal side seat at each end of the car body. The seats are of spring construction, 8 in. thick and covered with genuine hand-buffed leather. Cushions for the backs are 4 in. thick. Each vestibule is provided with a folding seat and an upholstered seat with back for the operator.

Other details of the car are Hunter illuminated signs, two rotary foot gongs, porcelain sanitary hand straps, Minier window wipers and hinged side window rods. Sixteen single-coil, cylinder type heaters are installed under the seats and two of the double-coil type in each vestibule. The operating equipment includes Westinghouse air brakes with 10-in. cylinders, Peacock staffless hand brakes, Westinghouse type 801-E-4 line switch equipment and K-75 controllers, chair level type, with TA-8 handle switches.

The Readers' Forum

Where Are the Many Track Maintenance Kinks?

PUBLIC SERVICE PRODUCTION COMPANY
NEWARK, N. J., Sept. 22, 1927.

To the Editor:

As a member of the committee of judges which is passing upon the various entries in your Maintenance Contest, I have been very much surprised at the relatively small number of items that have been entered by representatives of the way and line departments. Those that have been submitted possessed considerable merit, but it cannot be true that there are not many more special devices, developed by track and line men for everyday use to meet some particular need on their own property, which are simplifying some maintenance operation and reducing track maintenance costs. It is in the hope of attracting more attention from these branches of the service that this letter is written.

It is certain that throughout the country there are many special welding machines, contact devices for taking power from the trolley wire, special methods of grounding to the rail, spike pulling apparatus, rail straightening equipment, track drills, grinding tools, tar kettles, track gages and many other pieces of equipment too numerous to mention which have been developed to meet a local condition but which would have an application elsewhere and which have been playing their small part in putting the electric railway industry back on its feet.

Perhaps this apparent indifference is due in large measure to a feeling on the part of the track men that they cannot adequately express their ideas in writing or it may be due to their inability to secure the necessary photograph, snapshot or sketch of their pet device. Possibly the track men as a class are too modest, or it may be that they have not been fully advised of the contest and its terms. Then, again, it is possible that they have not considered that their device possessed sufficient merit to justify entering it in the contest.

But whatever the reason, the fact remains that entries from the equipment men were greatly in the majority and some mighty fine ideas have been submitted, so much so, in fact, that it was frequently quite difficult for the judges to pick out the winner.

There is no question but that in most cases the trouble could be corrected by a little co-operation between the engineer and the track foreman. It is the idea itself and its application which counts the most, the matter of penmanship and smoothness of expression of the idea being secondary to a well-illustrated device.

It is to be hoped that as the contest enters its second stage it will draw out an increasing number of entries from both the way and line departments.

HOWARD H. GEORGE,
Member Judges' Committee.

Long Life from Brake Hangers with Hardened Bushings

DALLAS RAILWAY & TERMINAL COMPANY
DALLAS, TEX., Sept. 20, 1927.

To the Editor:

Additional information is given in regard to brake hangers which were rebuilt to eliminate rattle, as described in the July 23 issue of ELECTRIC RAILWAY JOURNAL, page 156. The ball and socket hangers referred to are giving us an approximate mileage of 135,000. When we began first to use the straight hanger, as described, there was no such thing on the market as hardened steel bushings for these hangers. At the present time, however, we have 30 sets of Brill 177-E-1 trucks, and all the hangers for these have steel hardened bushings. These hangers are showing very little wear at the present time, after about one year's service.

J. L. BROWN,
Master Mechanic.

In Defence of the Double-Deck Car

WALLINGTON, SURREY, ENGLAND, Sept. 5, 1927.

To the Editor:

I have read with interest the editorial comments on my article on double-deck cars in your issue of July 30.

In Great Britain the upper deck attracts passengers by the freedom for smoking permitted and the provision of cross-seats. While this might not be the case in America, the provision of seats for the majority of passengers during rush hours should be sufficiently attractive. Even if the increased capacity and the economy of operation and street space are not considered of appreciable value, it cannot be disputed that the double-decker permits a higher standard of service. The big single-deck car can handle peak loads, but only with a high percentage of standing. Is not this improved service worth striving for?

I do not understand why a double-deck car with ordinary load is necessarily a two-man vehicle or why a headroom of, say, 6 ft. 3 in. should incommode standees.

Stair accidents over here seem to be extremely rare, yet the cars on our more progressive systems are smoothly operated. And I imagine that the acceleration and braking in London, due to 130-hp. equipment and track brakes, is as severe as any in America.

Finally, I suggest that if the stairs are placed away from the door, so that passengers may ascend or descend them while the car is in motion, there need be no difference whatever in the loading characteristics of double and single-deck cars.

HENRY WATSON.

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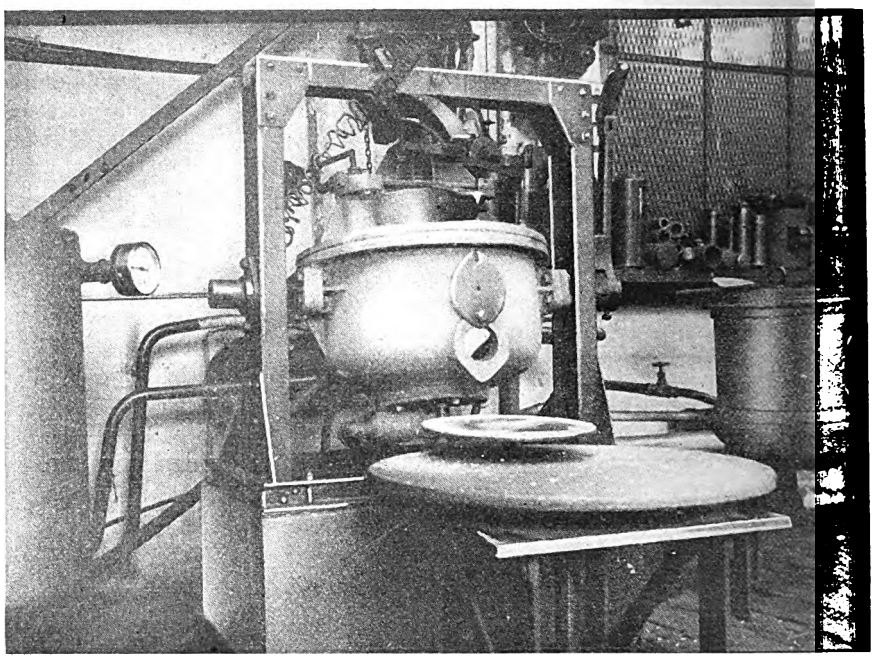
Maintenance Methods *and* Devices

Testing Pinions by Electro-Magnetic Method

MOTOR pinions are tested by an electro-magnetic method for minute cracks which would escape examination by the visual process in the shops of the London County Council Tramways, London, England. The method is similar to that used by the same system for testing axles, which was published in the issue of Aug. 27. The pinion is clamped in a frame, as shown at the right in the first illustration, so that it forms one leg of a magnetic circuit, the leg at the left being wound with wire. When direct current is passed through the coil the pinion is magnetized. It is then removed and retains sufficient residual magnetism so that when it is dipped into a box containing iron filings wet with kerosene, in a manner similar to that used for axles as described in connection with the testing of axles in the issue of Aug. 27, previously mentioned, the presence of any hair cracks is indicated by a line of filings which remain on the pinion at such points.

After the magnetic test the pinion is given a mechanical test in the frame shown in the second illustration. Two arbors are placed at the same distance as the gear and pinion centers in the motor. A standard gear is then placed on the gear arbor and the pinion to be tested is placed on the other arbor. When the pinion is turned by a crank any eccentricity or other defect in the form of the pinion can readily be seen. For the testing of gears the same device is employed, except that a standard pinion is used.

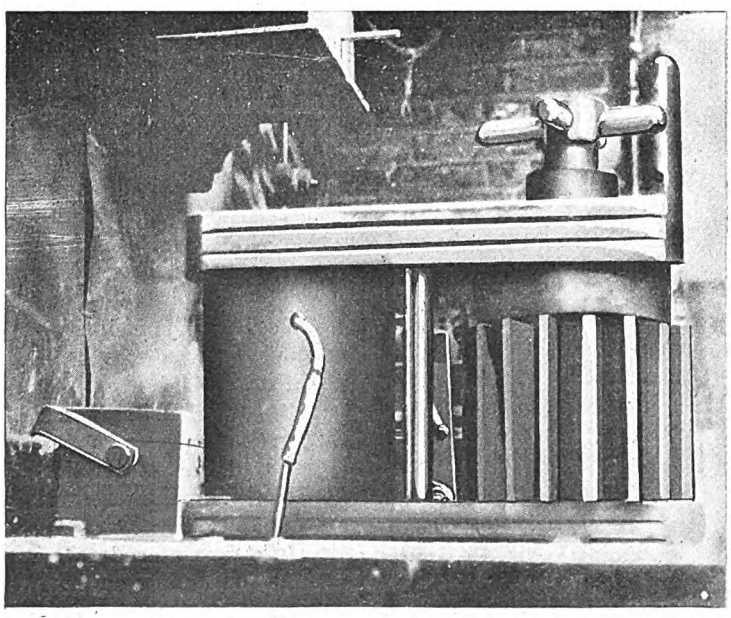
The distance between the centers of the arbors is adjustable to correspond with the gear centers of the various types of motors used on the property.



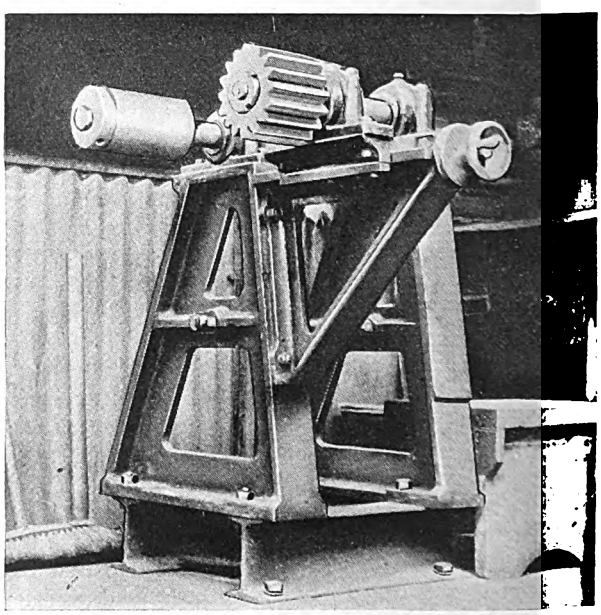
Temperature-gage regulated furnace for bearing metal, Dortmund

Bearing Metal Furnace

BEARING metal is best when melted and cast at just the right temperature. To insure this, the Dortmund Street Railway, Dortmund, Germany, has installed a furnace with an automatic temperature regulator. It is of the tilting type and the heat is supplied by gas. The furnace was built by the Aktiengesellschäft für Feurungstechnik, Berlin.



The magnetic process is used to test pinions for cracks in the shops of the London County Council Tramways



In this frame the mechanical perfection of a pinion and gear are tested

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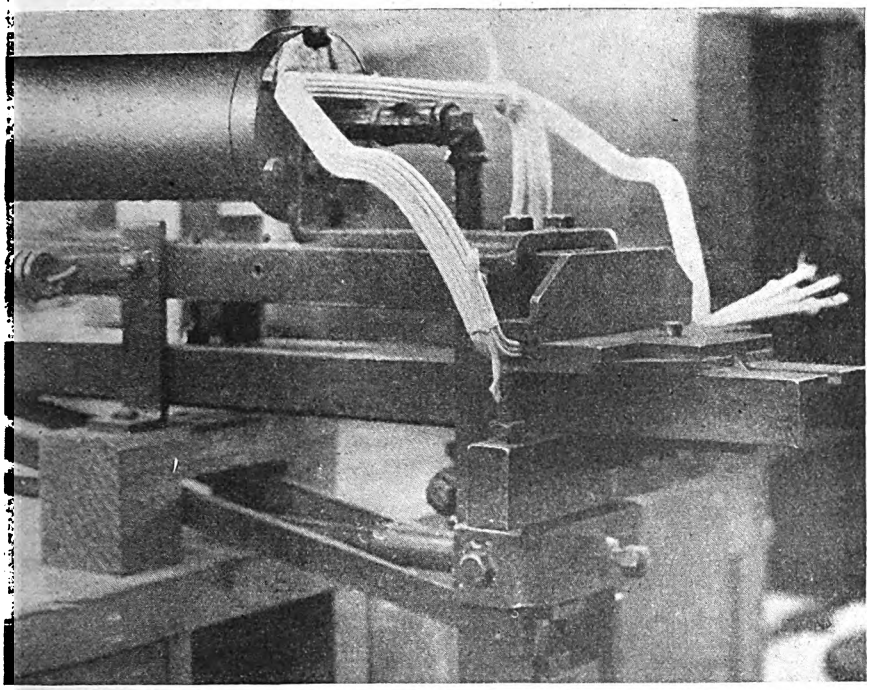
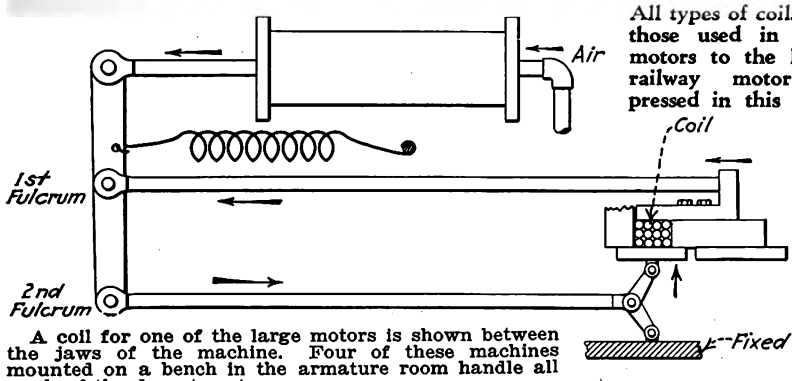
Armature Coils Clamped by Air



Air-operated armature coil press gives both upward and sideward pressure to the coil

The use of the toggle link to give the upward pressure and the employment of the principle of changing fulcrums on the rear vertical lever accomplish these results.



All types of coils from those used in pump motors to the largest railway motor are pressed in this device

A coil for one of the large motors is shown between the jaws of the machine. Four of these machines mounted on a bench in the armature room handle all work of the department.

COILS for all types of armatures, from those used in compressor motors to the largest size railway motors, are pressed in an air-operated device which was developed at and is now used in the South Park shop of the Los Angeles Railway. This clamp applies pressure to the newly wound coil in two directions, forming the sides and other portions of the coil to perfect shape.

The lower jaw of the clamp is first raised up against the coil. Then the outer portion of the clamp moves sideways toward the coil, thus compressing it in that direction. One air cylinder mounted on the top of the apparatus produces the double action by the use of a toggle lever or combined with the principle of changing fulcrums. The accompanying illustrations show how this is done.

The movement of the air cylinder piston to the rear first actuates the toggle links directly under the jaws and dies of the machine. After the toggle links have straightened out the fulcrum of the vertical lever at the rear shifts from its center to its extreme lower end. Continued movement of the air cylinder piston actuates the center lever, carrying the outside jaw or die of the machine with it.

Different size dies have been made for use with various sizes and shapes of coils. A battery of four of these machines is located in the armature room. They are capable of handling all of the work of coil pressing required by the department. The machine frame is made up of 2 x ½-in. flat steel with the head, dies and clamps of cast steel. An air cylinder built up of steel tubing has a stroke of approximately 8 in. and a bore of 4 in. The operation of the device is controlled by a treadle, which when depressed opens the air valve on the cylinder.

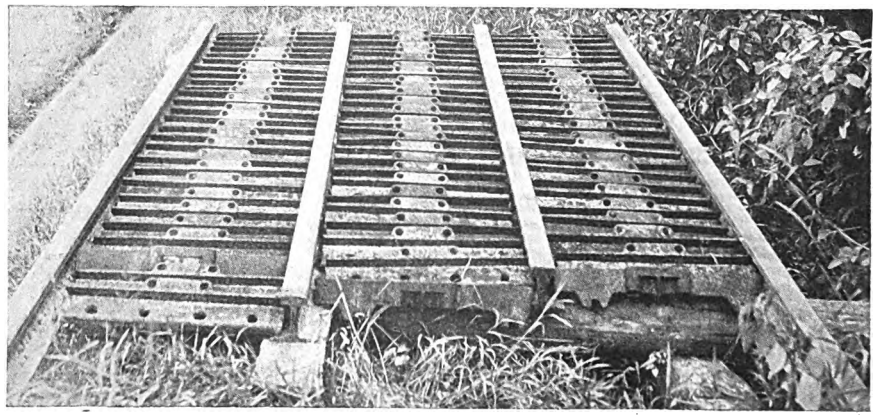
Old Rails and Angle Bars Used for Small Bridges

By A. H. Smith
Railway Superintendent Interstate Power Company, Dubuque, Iowa

IN RENEWING small railway bridges and crossing culverts on a toll road to one of its parks, the Interstate Power Company, Dubuque, Iowa, makes use of scrap rails and obsolete angle bars. The accompanying illustration shows the material arranged for a half section of one bridge.

In the construction a wooden form is spaced 1 ft. on each side of the skeleton bridge. After assembly the entire surface is filled in with concrete, on which the railway ties are laid. This furnishes a very permanent and substantial bridge over ordinary culverts.

This method of construction permits the use of the bridge almost immediately after it is finished as the rails are tied together with cross bars. With the usual type of reinforced concrete construction some time must be allowed for the concrete to set. With the construction used, however, the concrete is simply for spacing and holding the material together.



Material used for structure of half section of bridge

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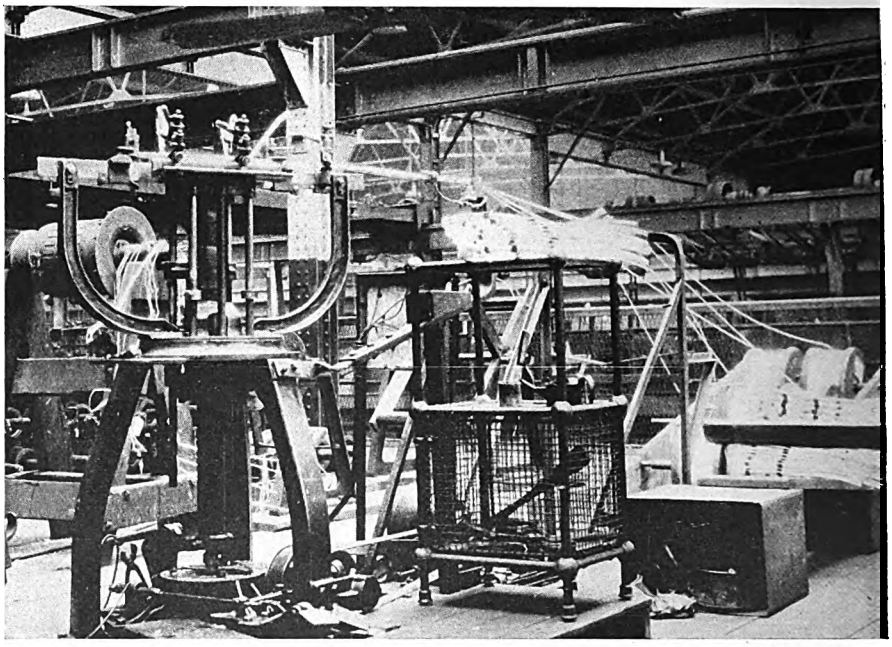
Coil Winding in One Process

WIRE armature coils are wound and shaped all in one process by a machine installed in the shops of the London County Council Tramways, London, England. It was built by the Midland Dynamo Company of Leicester and has an output of about 100 coils a day. It is known as the Quickway coil winding machine.

The armature coils are first wound as plain loops, after which the two arms shown in the illustration move outward, spreading the sides of the coils apart and giving the desired form to the ends. Obviously the arm movement required differs according to the type of motor for which the coil is intended, but the machine can be set to make any one of a number of various types of coils.

Incidentally, it might be said that where there are several separate wires in each coil it is the practice in these shops to use different colored insulation for each circuit. Thus if there are three circuits in each coil the insulation of the respective wires will be red, white and blue. This makes it very easy for the man who connects the leads into the armature to get the wires in their proper order because he simply has to put the wires into the commutator bars in the same regular rotation of red, white and blue.



This coil winder turns out 100 complete coils in a day

Cleaning Car Side Panels in the Hamburg Shops

STEEL cars are used by the Hamburg Elevated Railway of Hamburg, Germany, and considerable attention is given to the outside appearance. The cars are attractively painted in a light color. As an experiment, two cars have been equipped with vitrified enameled plates for the side and end panels to eliminate the cost of painting. These cars have been in use for about two years, with no trouble from flaking or chipping of the enamel. All of the other 333 rapid transit cars of the company are painted.

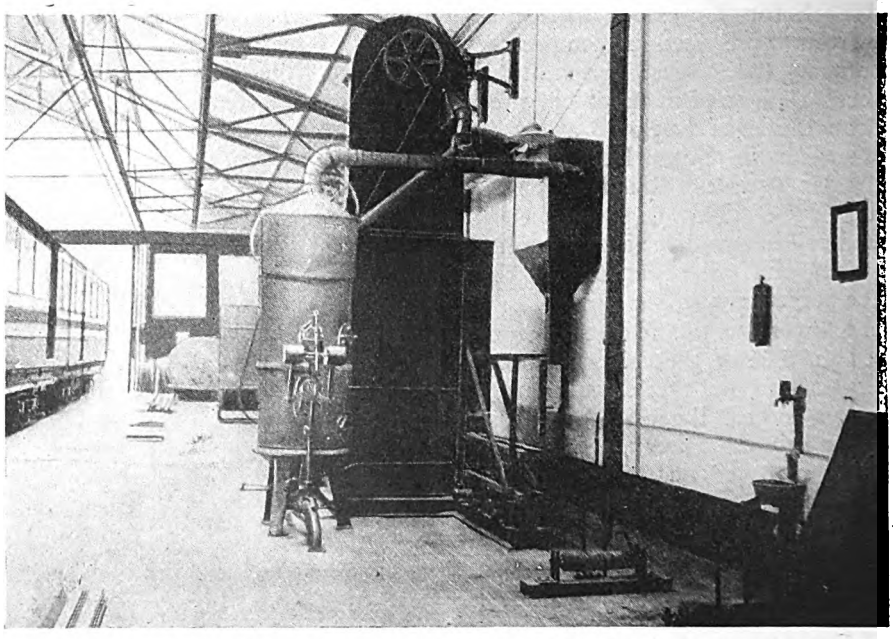
In spite of this care in painting, the side panels of the cars rust out in from ten to fifteen years, because of the moist climate in Hamburg, and they have to be renewed. This work is done in the shops of the railway company.

To clean the new plates from rust before they are attached to the framework they are run through the sand-blasting machine shown in the accompanying illustration. The plates travel over the rollers shown in the foreground through a slot into the back of the dark colored vertical chamber. The sand is then sprayed on the plate from two nozzles which are moved up and down so as to cover the entire side of the plate as it passes through the chamber. The sand later is automatically collected for reuse.

This sand-blasting machine is used also for similar cleaning of the side plates to be attached to surface cars, of which the company has 1,900, and of buses, of which it has about 80. Hence there is enough work for it to do, as all buses have steel bodies, and it is kept busy.

Pneumatic Hoists Change Trucks Under Car Bodies Rapidly

HYDRAULIC jacks are used by the London County Council Tramways, London, England, for changing car bodies in its shops, and the work is done so rapidly that only about half a minute is required to raise the car body. The car is brought in on a transfer table and when it reaches the lifting point there is a hydraulic jack under each corner post. There are several sets of these jacks on the line of the transfer table. They are connected by hose with the central source of supply, so they can



Inclosed sand blast for cleaning car side plates in the Hamburg Elevated shops

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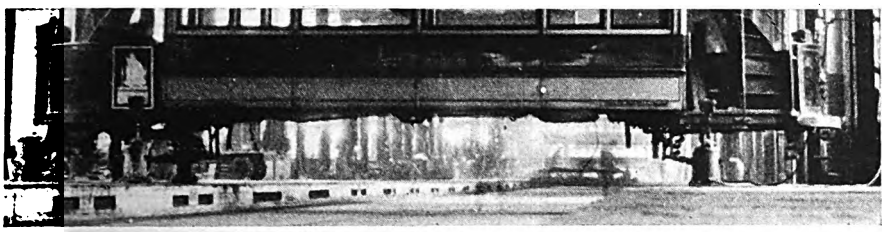


Hydraulic jacks on each side of the transfer table lift cars very rapidly for truck exchange in London

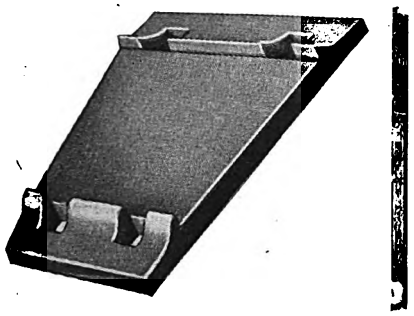
be moved if necessary to provide for their proper adjustment under the car. Movement of a handle then rapidly raises the car body in the short time mentioned.

While the old trucks are taken out and the new ones are being substituted there is opportunity for the workmen to examine the underside of the car. If the car body needs repair, dummy trucks are placed under it and it is then taken to the body shop.

New Equipment Available

Trapezoidal Tie Plate Without Long Heel

TO PROVIDE the necessary eccentricity of a tie plate for equalizing its bearing on the tie in an inexpensive manner, the Track Specialties Company, New York, N. Y., has just developed a new plate. It is wider on the outside than on the inside and a short heel is used instead of a long one. Maintenance of way men have long recognized the necessity of having a plate designed in such a manner that the center of gravity of the bearing area will lie outside the vertical plane through the web of the rail to coincide with the resultant of the vertical and lateral forces acting on the rail. The resultant is inclined in an outward direction and intersects the base of the rail outside the center line of the base.



New type of tie plate

The solution of this problem in the design of the tie plate has been to proportion it in such a manner that the center of gravity of the bearing area coincides with the point at which the resultant of the forces acting on the rail intersects the base of the plate. With a plate of rectangular outline, as ordinarily used, this is accomplished by offsetting the plate with respect to the center line of the rail so that it has a greater extension outside than inside the rail.

The new plate of the Track Specialties Company is symmetrical in the section about the center line of the plate, but its trapezoidal plan provides a wide edge along the outside of the rail and a shorter one along the inside of the rail base. This makes it possible to locate the center of gravity of the plate-bearing area at a sufficient distance outside the center of the rail to coincide with the resultant of the forces acting on it without extending it out as far as would otherwise be necessary. The short heel prevents the plate from curling so that the thickness can be reduced.

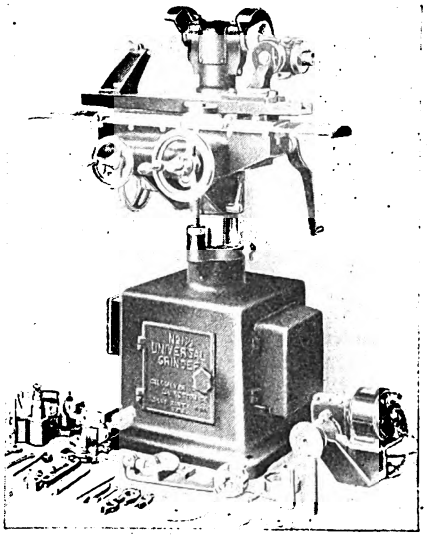
Plates of this design will be rolled from steel to meet the specifications of railways and can be had in any non-patented type of base, although the present plan is to roll these plates with flat bottoms. The plates are punched for either three or four holes, as desired, but must have shoulders on each side, as economy with beveled shearing demands that the plate be symmetrical in section.

Universal Cutter and Tool Grinder

PROVISION for a machine of medium capacity for grinding tools has been made in a new design just brought out by Gallmeyer & Livingston, Grand Rapids, Mich. Convenience of operation has received prime consideration. The machine is designed so that the knee, saddle, sub-table and table swing around the column, while the table in turn swivels on the sub-table. Transverse, vertical and longitudinal movement can be obtained from a position directly in front of the machine or from the rear of the machine. Both handwheel and lever movements are provided for the longitudinal movement.

	Inche
Size of table	5 x 26
Longitudional travel	16
Transverse movement	8
Vertical movement	6¾
Maximum distance center line of spindle to table	9¼
Maximum swing	9¼ x 20
Capacity for face milling cutters, diameter	12

The vertical and cross-movements are provided by an Acme thread running in a bronze nut. Both are fitted with graduated dials reading in thousandths of an inch. The longitudinal movement is provided by means of an accurately cut steel rack with which meshes an equally carefully cut steel pinion with ground shank or stem. This insures free movement devoid of backlash.



Cutter and tool grinder

The new machine is of very rigid construction and is equipped with hammered crucible steel spindles, ground accurately and running in well-oiled bronze bearings. Convenient means is provided for adjusting both for radial wear and end play. The machine can be furnished either belt driven or with self-contained motor drive. When furnished with motor drive, the equipment includes a 1-hp. motor placed in the base of the machine for driving the main spindle and a ¼-hp. motor built into the headstock for revolving the work. The accompanying dimensions show size and capacity.

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Association Activities

National Safety Council Meeting

Intense interest evoked by a series of well-prepared papers on various phases of safety in the railway field. A. W. Koehler elected chairman

DRAWN by a program of the most transcendent interest yet conducted, more than 250 individual representatives from the electric railways met in Chicago last week together with nearly 5,000 other representatives of American industry to participate in the sixteenth annual congress of the National Safety Council. The sessions of the electric railway men as well as the parallel meetings of 35 other groups, which were held in the Stevens Hotel from Sept. 26 to Sept. 30, were the largest and the most eminently successful of any yet sponsored by the council.

The electric railway section meetings were attended by representatives of all the principal properties of the country and many smaller ones, the delegations in many instances being composed of every class of employee, from operating executives to platform men and shop workers. Significant of the increasing co-operation between employees and managements in matters of safety was the presence of E. D. McMorrow, officially appointed delegate of the Amalgamated Association of Street and Electric Railway Employees of America. The section meetings this year were the best attended of any in the history of the organization, there being an average turnout on the three days of the congress of 235 delegates.

Summarizing the discussions and conclusions of the last annual meeting of the section, Truman Curtess, superintendent of transportation Chicago, Aurora & Elgin Railroad, asserted in opening the first day's program that an accident prevention program could be carried out successfully only when initiated and followed through by heads of departments. From this point the speaker turned to the more technical questions of stop signals, safety zones and other matters related to traffic regulation, his remarks being principally intended to introduce new points and to stimulate discussion of them. The consensus of all expressions given on the subject of stop signal locations was that they should be built on concrete blocks in the center of the road, although several delegates insisted that this system leads to frequent automobile crashes.

Selection of New Men Important

In connection with his paper on the "Selecting and Training of New Men and Their Relation to Safety," Clinton D. Smith, superintendent of personnel Cleveland Railway, declared that his company required a minimum of from ten days to two weeks instruction for all trainmen before they were permitted to take out a car. "The careful selection of employees is the most important factor in accident prevention and this should include not only physical examinations but mental and psychological tests as well," he said.

Mr. Smith strongly emphasized, however, that every employment manager must to a very considerable extent rely on his own observation and judgment in selecting an employee. Careful records, he added, should always be kept of every applicant on the theory that although no opening may exist at the time, it is conceivable that the man might some day make a valuable employee.

In the discussion which followed Mr. Smith's address, it was revealed that many street railway companies have employee training courses lasting three and four weeks or even longer. On the question of physical and psychological examinations, A. W. Koehler, Milwaukee Electric Railway & Light Company, interposed that his organization was a firm believer in both types and had consistently employed them for years. Others declared that no examinations of any kind were given to trainmen on their properties, while a few delegates indicated that the tests were confined to color blindness or other single factors.

Dr. Hart E. Fisher, medical director Chicago Rapid Transit Company, told the meeting of his own interesting experiences in obtaining the confidence of employees and their families in matters of health. "You cannot go at things in a mechanical way when you are dealing with human nature," was his parting remark.

In a paper entitled "Courtesy and Its Relation to Accident Prevention," L. M. Brown, vice-president Interstate Public Service Company, implanted the thought that "the courteous employee is usually the cautious and the efficient employee." Courtesy, he added, is a principle of modern transportation that should be regarded as of equal importance with convenient and reliable service and safe operation.

Addressing the electric railway delegates on the second day of the convention, H. H. Adams, superintendent of shops and equipment Chicago Surface Lines, referred to the light-weight, low-hung type of car, with pneumatically-controlled doors, treadles, folding steps, lightning arresters, line breakers, dead man's handle, illuminated signs and other features which have resulted in greater safety to passengers and trainmen. All of these devices are helpful, he declared, but should be utilized only after close study of operating conditions and practices as they exist on the individual properties.

Among the recommendations made by Mr. Adams in this connection was that brakes should be so proportioned to car weights that quick application will be insured. Good practice dictates a braking ratio of 9 to 1 with quick service valves, he declared. A clear-ringing, dependable gong is another essential to safe operation and the maintaining of schedules in congested city streets. The speaker also pointed out the necessity of regular 24-hour inspections of all vital parts of the car, such as brakes, fenders, flanges, etc., not only for improved safety but for the better maintaining of schedules. "Some equipment failures may be factors in accidents and excessive wear of parts should not be tolerated. Eternal vigilance is the price of safe operation," he concluded.

Gongs Still Have a Place

Discussion of Mr. Adams' paper centered principally around the most suitable type and location of gong and the various methods used in inspecting car equipment. E. K. Eastham, safety director of the United Railways of St. Louis, commented that many claims had been filed against his company on the grounds that the folding step had failed to operate properly and on this account 20 per cent of the cars in St. Louis had been equipped with "well-steps." Replying to a remark that gongs are obsolete, Mr. Adams said the real need was for better gongs, not for some substitute device, because the public has become accustomed to their sharp insistence. The question of how rapidly the gong should be struck, however, is one that is well worth study, he avowed. To the question of what time limit he thought should be placed on the application of the controller handle, Mr. Adams replied that the Chicago Surface Lines endeavors to keep its equipment maintained so that the motorman may feed up his controller rapidly and brake at the rate of 4 m.p.h. per second in order to maintain the highest possible schedule speed, which at the present time, he added, averages about 11.2 m.p.h. Mr. Eastham's comment on this statement was that if such a practice were permitted in St. Louis the company would have 25 claims a day from passengers thrown out of their seats.

A delegate from the United Railways & Electric Company of Baltimore contributed the information that on articulated cars in his city and in Boston trolley bases are placed over the front

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truck, the trolley rope being led down through a slot in the roof to a retriever located inside the car at the center. This arrangement was reported to be a great time saver and a positive factor in the conductor's safety.

In order to simplify the daily inspection of equipment on the Chicago Surface Lines, Mr. Adams explained, in closing the discussion, that all defects can be quickly spotted and handled from the reports turned in by the motormen at the end of the day's runs.

Character and Enthusiasm Essential

"Earnestness, enthusiasm, strength of character and knowledge of his property are the essential requirements of a successful safety director," declared A. W. Koehler, superintendent of accident prevention Milwaukee Electric Railway & Light Company, "because it is almost impossible for the superintendent to get in touch with every man of his organization, and the safety director must be qualified to substitute for him. Since the electric railway business does not lend itself particularly well to the use of mechanical safeguards, safety work in this industry is dependent very largely on intensive education, bulletins, posters, and above all, personal contacts with every individual of the railway organization."

The most important functions of the railway safety committee, Mr. Koehler said, may be classified as follows:

1. To inspire confidence and respect for the company's safety activities.
2. Dissemination of information about accidents and causes of accidents.
3. Stimulation of interest in safety suggestions and in planting in the employee's mind that the management is anxious to receive them.
4. Investigation of conditions and practices leading to every accident and the making of recommendations as to the kind and degree of discipline to be meted out.
5. If the men serving on safety committees can be made to feel individual responsibility in such work, they are almost certain to take keener interest and greater pride in other functions of their jobs.

While he suggested a number of methods that have been successfully employed in selecting safety committee personnel, Mr. Koehler was of the opinion that such appointment should always be governed by local conditions. Regardless of whether the members are selected by the employees from their own numbers or whether they are appointed directly by the superintendent, it is essential that unlimited inspiration be given to the members of the committee. Only such men as are natural leaders should be placed on the safety committees and too much system should not be allowed to harass them.

"Because of the natural seriousness of the work they are engaged in, the most satisfactory results can be obtained when humor is injected into the meetings," he said. "If any real response is to be won from the employees, some kind of answer should always be given to their safety suggestions, for it is only according to the degree of co-operation and interest you as managers evidence in the work that will get results from your safety organization and your entire personnel."

Discussion of Mr. Koehler's paper brought out that on most properties where safety principles have been adopted, safety meetings are always held on company time in order to assure good attendance. They should be brief and to the point and the appeal should always be made to the employees' reason. A representative of the Pittsburgh Railways announced with some degree of pride that employee suspensions had been abolished on his property. On the question of compensation for safety suggestions, Mr. Koehler declared that this practice had not been established in Milwaukee.

Safety Is Common Ground Between Utility and Public

In an address made by Col. E. C. Springer, general manager Lehigh Valley Transit Company, Allentown, Pa., safety was declared to be the only common ground on which the public utility and the general public can meet and converse in the same language. "Safety will win the friendship of the public where politics fails," Colonel Springer asserted. Safety work can be made a tremendous factor in strengthening public relations, through co-operation with chambers of commerce, motor clubs, community and civic organizations, the radio, newspaper and other local agencies.

Safety is also a potent factor for efficiency and production in every industry, the speaker maintained, but as such has been singularly neglected by the electric railway industry. "Our industry can derive a large measure of profit from the heavy investment and wide experience in safety work of other industries," he declared. "The study of safety is inevitably a means to better understanding of working conditions, and, therefore, to greater efficiency in production.

"Unlike the experience of most industries," said Colonel Springer, "the experience of electric railway operators has been that safety must work from the executive staff down, hence the management must be completely sold on the idea. Only when it is strenuously and consistently promoted can safety work produce the desired results." In successful accident prevention work, he pointed out, proper selection of men, thorough dissemination of knowledge, and a fair and reasonable policy of discipline are the most important factors. Inasmuch as reduced cost of operation is one of the outstanding problems of the electric railway industry today, safety committees should be constantly on the watch for waste and carelessness.

That newspapers throughout the country publish a daily safety story in an effort to reduce the annual toll of 90,000 lives in traffic accidents as well as to inform the public of the work being carried on by all industry to relieve this situation, was the suggestion made by P. J. McGrath, international fifth vice-president of the Amalgamated Association of Electric Railway Employees of America. In urging that every wage worker should be a safety engineer, Mr. McGrath asserted that every employee should be given every possible opportunity to participate in the work of advancing his own safety and that of others. The wage worker has greater interest in safety than any other because he cannot afford lost time. "The best safety comes when all factors of the public utility industry—the investor, the management, the employee and the public—harmonize in watchfulness and when a spirit of co-operation and confidence binds them closely together."

Mr. McGrath also reported that the street car men's union was fully alive to the value of safety work, and that at the last annual convention of the Amalgamated Association resolutions had been passed urging co-operation of employees with the management in this work and that an official delegate be sent to the present congress of the National Safety Council.

Less Emphasis on Speed

J. S. Kubu, assistant superintendent accident department, Cleveland Railways, took the interesting stand that automobile manufacturers should be restrained from emphasizing speed in their advertisements and that laws should be enacted restricting the manufacturer from producing cars capable of being driven at "insane" speed. The psychological effect of the speed advertisements on the public mind, especially its impression on the minds of young people, Mr. Kubu said, is probably very directly linked up with the appalling number of automobile accidents.

Other suggestions made by Mr. Kubu in the interest of reducing collisions between vehicles on city streets embraced the adoption of public liability laws to keep the driver of the cheap car and the driver who has had frequent accidents off the highways; the estab-

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Oct. 18-21*—National Association of Railroad and Utilities Commissioners, thirty-ninth annual meeting, Baker Hotel, Dallas, Tex.**

***Oct. 26-27*—Public Utilities Association of West Virginia, annual convention, Parkersburg, W. Va.**

***Oct. 26-27*—Society Automotive Engineers, Transportation Section meeting, Hotel Sherman, Chicago, Ill.**

***Nov. 4*—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York City.**

***Nov. 2-3*—Iowa Electric Railway Association, operating and maintenance sections, annual convention, Blackhawk Hotel, Davenport, Iowa.**

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lishment of a uniform system of physical and intelligence examinations and comprehensive road tests for all drivers; the widespread dissemination of knowledge on accident prevention and the establishment of a uniform code of justice for traffic violations.

"Many good things have been said about safety activities," concluded Mr. Kubu, "but specific things must now be done. Safety organizations must be more thoroughly co-ordinated and then we nust open the public's eyes to the human relationships involved in accident prevention measures."

Leading off the discussion on Mr. Kubu's paper, E. K. Eastham, safety director United Railways of St. Louis, voiced the opinion that the electric railway industry should be represented at all national and state traffic and safety conferences in order to see that our point of view is adequately and clearly presented. He also recommended that the laws which were framed by the Hoover Conference on Motor Vehicle Laws be passed in every state of the union. Thomas Fitzgerald, vice-president Pittsburgh Railways, favored the Hoover laws in general but expressed the belief that if autos were to be prohibited from passing standing street cars at loading points excessive traffic congestion would result. Instead of such a rigid regulation, Mr. Fitzgerald held that it would be better to permit autos to pass when driven slowly and carefully and only when sufficient clearance allows. Mr. Eastham agreed that this practice would be satisfactory if adequately protected safety zones were to be provided. Representatives of the street railway properties in Providence, Pittsburgh and St. Louis declared that yellow street markers are used to indicate the sweep of cars on curves in their cities, and a delegate from the Des Moines City Railway suggested that in order to assure better treatment for the company in court, the arbitrary term of "safety zones" should be changed to "loading zones." The motion that a committee be appointed by the chairman of the electric railway section to investigate compulsory liability insurance and to report its findings to the section was lost for want of a second.

Street Accidents Increasing

In a paper entitled "A Statistical Review of the Accident Experiences of Electric Railways," G. R. Whitmore, general claims attorney Illinois Power & Light Corporation, presented a table of accident statistics gathered from more than 100 city and interurban railways and motor coach properties in all parts of the country. His figures indicated that while there had been a marked decrease in the past five years in the number of interurban railway accidents, due to increasing street congestion, accidents on city lines are steadily gaining, and that the average car-miles per accident show similar tendencies. (See tables above.)

Mr. Whitmore remarked that in the light of records shown by his tables, electric railway managements are to be

ELECTRIC RAILWAY ACCIDENT AND PERSONAL INJURY FREQUENCY, EXPRESSED IN CAR-MILES PER ACCIDENT AND PER INJURY

Year and Number of Reporting Companies	Average All Accidents	Collisions		Injuries			
		Motor Vehicle	Car	Average All	Passenger	Employee	Other Persons
1922 (104)	3,030	6,380	146,940	14,250	25,040	62,320	70,490
1923 (104)	2,800	5,600	124,280	14,250	25,730	58,440	70,460
1924 (105)	2,610	5,150	123,770	13,780	24,820	96,220	45,620
1925 (113)	2,750	5,030	149,250	13,660	28,050	68,450	43,110
1926 (113)	2,680	5,110	115,040	13,880	26,620	84,480	44,270
57 City Companies							
1925	2,420	4,770	117,920	13,640	26,630	74,380	44,760
192	2,380	4,710	111,950	12,970	24,250	81,580	42,310
13 Interurban Companies							
1925	11,890	25,020	346,060	56,110	241,620	110,150	217,110
1926	12,100	24,850	550,480	58,610	183,490	136,400	233,530
43 Companies, Combined City and Interurban							
925	3,870	6,590	184,960	16,500	37,340	82,110	46,140
1926	3,630	6,020	167,890	15,480	32,060	88,940	45,080

BUS ACCIDENTS, BUS-MILES PER ACCIDENT AND PER PERSONAL INJURY

Year and Number of Reporting Companies	Average All Accidents	Vehicle Collisions	Injuries			
			Average All	Passenger	Employee	Other Persons
1925 (20)	4,780	10,670	10,720	38,960	91,020	17,660
1926 (20)	4,520	9,510	10,510	34,000	75,170	19,090
10 City Companies						
1925	3,660	7,730	7,400	30,180	56,870	11,840
1926	3,750	7,940	8,510	32,920	49,380	14,960
4 Interurban Companies						
1925	11,850	16,070	278,540	835,630	1,671,270	557,090
1926	14,620	22,760	179,840	359,670	899,180	599,460

congratulated. "The fine work on the part of these companies," he said, "is keeping other accidents down. But let us not stop here; it should be our aim to establish a mark of 5,000 miles per car accident, and then to strive earnestly to add at least 1,000 miles per car-mile per year thereafter."

In the discussion which followed this paper, H. R. Hodgson, East St. Louis Railway, brought up the question of uniform accident reports, declaring that many companies differ as to what constitutes chargeable accidents, and that as a result, national accident statistics are often misleading. Commenting on Mr. Hodgson's statement, E. K. Eastham, chairman of the section's committee on uniform accident statistics, announced that a resolution embodying the following recommendations had been filed with the claims section of the American Electric Railway Association: (1) that every accident, including non-chargeable cases, be recorded in the figures sent out by each company to central bodies; (2) that such uniform records shall be kept for inter-company use only and shall not be permitted to interfere with intra-company methods.

At the general round-table discussion following these talks questions regarding proper colors for cars operated at night and during heavy fogs; suitable air pressure, and the relative advantage of the one-man car were treated at length, although no general conclusions were recorded on any subject. H. K. Bennett, safety manager United Electric Railways of Providence, extolled the virtues of the white and yellow cars used on his company's lines. A. R. Bowman of the Milwaukee Electric Railway & Light Company suggested his company's combination of red and yellow as a means to greater visibility, while others suggested all white or all yellow, or the use of floodlighted dashers.

Replying to E. D. McMorrow's criticism of the one-man car on the ground that too many duties are simultaneously required of the operator, Mr. Shaw of the Akron, Ohio, property asserted that larger responsibilities have made the operators of one-man cars much more careful and efficient. In Akron and Canton, Ohio, he said, 100 per cent one-man operation has resulted in the same headway and average speed of cars being maintained as had been possible with the old two-man equipment, that there have been fewer accidents and that the men like the one-man cars better than those formerly used. Members of the Pittsburgh, Providence and Milwaukee delegations reported similarly satisfactory results from one-man operation. Mr. Fitzgerald of Pittsburgh told the meeting that it was the one-man car that had saved the insolvent Pittsburgh Railways and that while the speed of one-man cars on his property is slightly lower than that of two-man equipment, there has been a decrease in the number of accidents.

That no fixed standard should be prescribed for air-pressure condition was the opinion of the majority of those who entered into the discussion. While 60 lb. pressure may be adequate in some cities, Pittsburgh representatives felt that 90 lb. was more nearly the standard on their properties, but they admitted that the whole question depended upon local operating conditions.

Concluding the three-day meeting of the electric railway section was a talk on "Utilizing the Radio," by H. K. Bennett, safety manager United Electric Railways of Providence, R. I., and originator of the now famous "Uncle Red's A.B.C. Club of Providence." Mr. Bennett told of the idea which resulted in the formation last November of the children's radio club, now

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boasting more than 135,000 juvenile members throughout the country. Tens of thousands of letters, he said, have been received from these children in which they pledge to abide by the simple common-sense rules of the club. The influence of his radio talks has also spread to many parents and teachers with the gratifying results that the number of accidents to children in the state of Rhode Island has shown a notable decrease.

The New Officers

At the close of the session on Sept. 29, the following officers were elected for the ensuing year: Chairman, A. W. Koehler, superintendent of accident prevention Milwaukee Electric Railway & Light Company; first vice-chairman. H. K. Bennett, safety manager United Electric Railways, Providence, R. I.; second vice-chairman, E. K. Eastham, safety director United Railways of St. Louis; third vice-chairman, Melvin W. Bridges, safety engineer Chicago Rapid Transit Company; secretary, J. E. Stott, Georgia Power Company, Atlanta, Ga.

Members of the electric railway section elected to offices in the National Safety Council for the year 1928 were: George T. Hellmuth, general claims attorney North Shore Line, treasurer, and M. R. Brabson, Birmingham Electric Company, Birmingham, Ala., director.

Iowa Operators to Meet Nov. 23

OPERATING and maintenance sections of the Iowa Electric Railway Association will hold their annual meeting at the Blackhawk Hotel, Davenport, Iowa, on Wednesday and Thursday, Nov. 2 and 3. It is planned to have a number of good speakers and to make this an even better convention than was last year's.

A.E.S.C. Standards of Interest to Electric Railways

THREE important standards dealing with electric railway practices have recently been approved by the American Engineering Standards Committee. The first is a standard specification for tubular steel poles for electric line construction. The importance of this standardization work may be understood when it is considered that 1,400 combinations of tubular steel poles have been shown in a catalog of a single company, while sixteen are sufficient to meet practical commercial needs. A simple table of deflections has been prepared for use in designing the poles based on a regular theoretical point. The specifications are believed to apply to all tubular steel poles, no matter by what process manufactured.

The second standard is a group of three 7-in. plain girder rails and splice bars for use in paved streets. The rails weigh 82, 92 and 102 lb. per yard.

Approval of standard specifications for cross ties and switch ties marks the completion of an important piece of work extending over a period of years, during which time the steam railways and electric railways have co-operated on this subject of common interest. About 100,000,000 ties are produced annually in this country.

American Association News

New Executive Committee Begins Year's Work

PRESIDENT R. P. STEVENS presided at the opening meeting of the new executive committee of the American Electric Railway Association, which was held at the Cleveland Hotel, Cleveland, Ohio, on the afternoon of Oct. 6. The following were recorded as present:

R. P. Stevens, J. P. Barnes, J. H. Hanna, C. E. Morgan, Lucius S. Storrs, Barron Collier, W. H. Sawyer, Edward Dana, T. A. Kenney, M. B. Lambert, S. J. Cotsworth, Charles R. Ellicott, H. L. Brown, T. W. Casey, D. W. Snyder, J. G. Barry, J. R. Fitzpatrick and J. W. Welsh, active members; F. R. Coates, J. N. Shannahan, Robert I. Todd and A. W. Brady, past-presidents; W. W. Holden, representing the Southwestern Association; Labert St. Clair, J. W. Colton and Leslie Vickers of the association staff.

On motion of Mr. Barnes, the minutes of the last meeting were approved without reading, with the understanding that they would be mailed to members.

On motion of Mr. Barnes, seconded by Mr. Cotsworth, J. W. Welsh was elected general secretary for the ensuing year.

President Stevens introduced the new members of the executive committee who were present.

Mr. Shannahan stated that the resolutions presented at the general session of the association in the morning covered the thanks of the association to all those responsible for the convention and exhibit, except the director of exhibits, and he moved that a special vote of appreciation be extended to him on behalf of the executive committee. This was seconded by Mr. Barnes and unanimously carried.

Subjects for Coming Year

H. L. Brown, chairman of the committee on subjects and meetings, presented a progress report covering the proposed work of committees for the coming year. Under consideration are a committee on customer relations, a committee on industrial relations, a national women's committee and a traffic problem committee. The committees definitely recommended for continuance are the following: Co-operation with the motor vehicle industry; co-operation with manufacturers; co-operation with state and sectional associations; education; insurance; management and operation; rapid transit; taxation; Charles A. Coffin Award; Hoover conference; motor vehicle information; motor bus depreciation.

In certain instances last year's committees have recommended work for the coming year, while others have not. It was also definitely recommended that the new subjects and meetings committee continue at the next convention the round-table luncheon conferences. On motion of Mr. Storrs, the report of the committee was accepted with a further recommendation that it favorably consider the general plan of holding the type of convention meetings adopted this year. This was seconded by Mr. Barnes and unanimously carried.

Mr. Shannahan moved that the committee express its appreciation of the excellent work done by the meetings and subjects committee, stating that he could not recall any committee that had done better work. This was seconded by Mr. Sawyer, who stated that this committee stood out as leading in the conduct of the convention. The motion was unanimously carried, the president stating that he planned to continue the same committee for the coming year.

Committee Chairmen Announced

President Stevens announced the chairmen of the following committees for the coming year, as follows:

Advisory Council, B. C. Cobb; policy, J. P. Barnes; meetings and subjects, H. L. Brown; publicity, Paul Shoup (Barron Collier, vice-chairman); membership, C. E. Morgan; finance, T. A. Kenney; national relations, J. H. Hanna; publications, J. H. Hanna; publication of *Aera* (sub-committee), H. V. Bozell, statistics (sub-committee), F. W. Doolittle; convention location, F. R. Coates (J. G. Barry, vice-chairman); co-operation with state and sectional associations, T. A. Kenney. Additional appointments are to be made in the near future.

Resolutions on the death of Charles L. Henry were read by Mr. Welsh. After the reading, A. W. Brady, chairman of the resolutions committee, suggested changing the resolutions to indicate that they were adopted by the executive committee instead of by the association. On motion of Mr. Brady, seconded by Mr. Storrs, these motions were unanimously adopted.

Plans for 1928 Convention

There was considerable discussion as to whether an exhibit should be held in 1928, in view of the suggestion that exhibits should be held in alternate years. The possibility of holding the convention on the Pacific Coast in 1930, when it would be difficult to hold an exhibit, was considered in connection with the possibility of not holding an exhibit in 1928. The question of the expense to the manufacturers and the

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difficulty of measuring the value to the manufacturers was presented, and that this all was reflected in an increased cost to the industry. Counter arguments were presented to the effect that much of the inspiration and interest on the part of the membership was due to the exhibit, particularly among the junior officers of companies. The possibility of the new convention hall at Atlantic City being completed was presented and the desirability of having an exhibit there in 1928 was suggested. The need for canvassing the manufacturers broadly, particularly the smaller ones, was also suggested. The possibility that more numerous meetings and round-table conferences might take the place of the exhibit was suggested.

As no action had been taken on the recommendation of last year's finance committee that the dues be fixed for the coming year on the basis of the maximum prescribed in the new constitution, the report of that committee was read. There was some discussion on the basis underlying the budget for the coming year, as recommended by the finance committee in last year's report. On motion of Mr. Barnes, seconded by Mr. Casey, the report of the finance committee was approved. Mr. Barnes then moved that the dues for the coming year be fixed on the basis recommended by the finance committee. The motion was seconded and unanimously carried.

On motion of Mr. Barnes, seconded by Mr. Storrs, the price of an annual subscription to *Aera* was continued at $2.

There was some discussion as to the best date for the next meeting of the executive committee. Since some of the Western members expected to be in New York for other reasons on Nov. 12, it was agreed that the next meeting be held in New York City on Friday, Nov. 11.

There being no further business, the meeting adjourned.

Old Executive Committee Completes Work

The final meeting of the old executive committee, which was held at Cleveland on Oct. 3, to check last minute arrangements, failed to develop a single oversight which might mar the smooth functioning of the convention, it was said.

Reports on luncheon meeting ticket sales indicated that all of these affairs were sold out early, the attendance being limited to a specified number. Arrangements were made to take moving pictures of this event and to show them at the theater party Wednesday night.

Reports of all standing committees were made during the meeting. That of the membership committee, made by C. R. Ellicott, chairman, indicated a total company and manufacturer membership of 802, the largest on record for the association. Individual memberships likewise showed an increase of 144 for the year. Fifteen company members and 22 individual members were elected, as reported in more detail elsewhere in this issue.

The financial condition of the association for the fiscal year just ended is a healthy one, according to the report of the finance committee, presented by C. E. Morgan, chairman. This committee recommended that the schedule of dues, suggested by the committee on revision of constitution and by-laws, be adopted. Although this represents a substantial increase in the former regular dues of member companies, it consists merely of a consolidation of the former dues with former revenues received by special assessment, and originally underwritten by the Advisory Council upon the formation of that body.

Resolutions Adopted at Cleveland

RESOLUTIONS of appreciation in connection with the past association year and particularly regarding the annual convention were prepared by a committee appointed for the purpose, consisting of J. N. Shannahan, chairman; G. A. Richardson, W. E. Wood, J. G. Barry and T. W. Casey. These resolutions, which were adopted unanimously by the American Association, follow:

Resolved, That the American Electric Railway Association, assembled in its 46th annual convention, express its appreciation of and gratitude for the untiring, enthusiastic and inspiring co-operation of those who have had a part in making this convention so notable in the annals of the association.

Especially are we indebted to the Cleveland convention committee for the successful manner in which it carried through the difficult task assigned to it. To the chairman, Col. Joseph H. Alexander, we express our heartfelt thanks. To the people of the city of Cleveland and to the officials of Cleveland who welcomed us and made us feel that we were indeed among warm-hearted friends we offer our cordial appreciation. To the City Manager of Cleveland, in particular, to the executive officers of the Auditorium, to the hotel managements and the various contractors who supplied the convention with services we express our gratitude.

We extend our thanks to the Cleveland Railway for its wonderful assistance in making this convention such a success, not only because of the manner in which it handled the placing of cars and other details of the exhibit, but also for its contribution to the entertainment program and for the many courtesies which it and its representatives have shown us.

And to the Pittsburgh Railways is due our deep appreciation for its co-operation in sending to us the magnificent Pittsburgh Railways Employees' Band, an organization that well deserves the high place it has attained among American bands.

We thank the Cleveland newspapers for the completeness of their reports of our sessions, and especially for the accuracy and intelligent understanding of our business evidenced in the work of the reporters assigned to our convention.

We are indebted to the committee on meetings and subjects for arranging a most interesting and valuable program, and to the distinguished speakers who were our guests for their able discussion of the problems that confront us and the help they offered us in meeting them.

The exhibit committee, in preparing for us the greatest exhibit in the history of the association, and particularly for its work in bringing about the great display of street cars through the fine co-operation of manufacturers and operating companies, deserves our warmest thanks, which are hereby recorded.

We extend to the entertainment committee our thanks for the excellent program which it prepared and so carefully supervised.

To the efficient work of our executive secretary, James W. Welsh, and the association headquarters staff we give hearty recognition.

Our thanks are extended to the Electric Railway Journal for its Convention Daily.

We renew our confidence in, affection for and loyalty to our managing director, Lucius S. Storrs, and we pledge him our fullest co-operation in every way in his most important and difficult work.

To our Advisory Council and its chairman, B. C. Cobb, we express our gratitude for its counsel and advice during the year.

Our thanks and appreciation are extended to our retiring president, W. H. Sawyer, for the sacrifices he so willingly made during his term of office. He has journeyed many hundreds of miles to visit state and sectional associations and has carried to them the enthusiasm and encouragement with which he abounds. There is no man who believes more earnestly in the electric railway industry or who has striven harder for what he believes to be for its best interest.

To all others who have in any way contributed to the success of this great convention and exhibit we are sincerely grateful.

We ask that this resolution be spread upon the minutes of the association and a copy sent to the trade press and the Cleveland newspapers.

New Association Members

FIFTEEN companies and 22 individuals were elected to membership in the American Electric Railway Association at the meeting of the executive committee held on Oct. 2 in Cleveland. The company members include two operating companies, one associate and twelve manufacturers. A list of the company members elected follows:

Operating Companies

Lake Erie & Northern Railway, Galt, Ont., Canada.

London Street Railway, London, Ont., Canada.

Associate

N. D. Ballantine, consulting engineer, New York, N. Y.

Manufacturer Companies

Aqua Oil Service, Inc., New York, N. Y.

Binks Spray Equipment Company, Chicago, Ill.

Brooks Steam Motors, Ltd., Stratford, Ont., Canada.

R. W. Cramer & Company, New York, N. Y.

Crew-Levick Company, Philadelphia, Pa.

Hannum Manufacturing Company, Milwaukee, Wis.

Laconia Car Company, Laconia, N. H.

Lebanon Steel Co., Lebanon, Pa.

Shuler Axle Company, Louisville, Ky.

South Bend Lathe Works, South Bend, Ind.

United States Air Compressor Company, Cleveland, Ohio.

Wiener Body Company, Newark, N. J.

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News of the Industry

Another Franchise Draft Soon for St. Louis

Mayor Victor J. Miller of St. Louis, Mo., has stated that he hopes to be able by Nov. 15 to present to the Board of Aldermen an ordinance for enfranchisement of the United Railways under a service-at-cost plan. Mayor Miller indicated that the new measure will differ only little from his former service-at-cost plan, abandoned this summer because the city officials and the reorganization committee of the railway could not agree upon the questions of valuation and rate of return.

Alderman Samuel L. Wimer has presented to the Board of Aldermen a resolution calling for another aldermanic inquiry into the problem of transportation in St. Louis. Alderman Wimer says the purposes of his proposed inquiry are:

1. To consider "this scheme to grant a 'service-at-cost' franchise" and its effect upon the development of any system of rapid transit which later may be devised.
2. To learn what bearing a franchise of this kind would have on any future plan under which the city might desire to acquire and operate these surface lines on its own account.
3. To determine the feasibility of the city acquiring and operating the surface lines at this time.

The committee of three proposed by Mr. Wimer would include him as chairman of the board's special committee on Rapid Transit, Edward Wiehe, chairman of the board's committee on public utilities, and President Neun. The board cannot appoint to its committees non-members, but Mayor Miller, Comptroller Nolte, City Counselor Muench and E. R. Kinsey, president of the Board of Public Service, are formally invited to sit in with the committee.

San Francisco Votes to Retain Delos F. Wilcox

In the face of the assertion by Nelson A. Eckart, assistant city engineer, that the appointment was illegal, supervisors of San Francisco, Cal., by a vote of fifteen to three overrode Mayor Rolph's veto of Delos F. Wilcox's designation as an expert to make a 60-day survey of the local street railway situation.

In addressing the supervisors Mr. Eckart declared that the appointment of Mr. Wilcox is a violation of the city charter. He quoted a section of the charter which provides that work connected with the operation of any public utility owned or controlled by the city must be certified as necessary by the city engineer. Further, Mr. Eckart pointed out that the appointment of Mr. Wilcox had been opposed by City Engineer O'Shaughnessy, who had advised the Mayor to veto the measure appointing him.

Court action may follow as a result of the veto upset, but at any rate the matter will be put up to the voters on Nov. 8.

Mayor Rolph has drafted an ordinance to be voted on by the electorate proposing that the Board of Public Works shall appoint a commission of three members to study and report upon the valuation of the physical properties of the Market Street Railway and investigate the situation confronting the city at the expiration of the company's franchises. The three would be selected from a list of 24 names, six each to be submitted by the presidents of the University of California, Stanford and Santa Clara Universities and St. Mary's College. The three members finally selected would make their report in 90 days and it is stipulated that their recommendations must provide for maintenance of a 5-cent fare within the city limits of San Francisco with half fares for school children. The Mayor has power under the charter to put this ordinance on the ballot.

Committee Approves New Chicago Bills

Three of the five measures intended to help unification program are advanced by Aldermanic action—Two more measures to be considered—Full program expected to go before board at an early date

THREE of the five new bills representing the city of Chicago's views as to the kind of legislation needed to settle the local transportation problem were formally approved on Oct. 11 by a subcommittee of the City Council committee on local transportation. Modeled after the original company bills, which failed to pass at the last session of the Legislature, the new bills were drawn up several weeks ago by James W. Breen, assistant corporation counsel. The three measures which were approved are the subway bill, the bill providing for the consolidation of surface, elevated and bus lines, and one creating a local transit commission. The other bills, which amend the cities and villages act to allow franchises of more than twenty years and provide for the issuing of terminable permits, are expected to be approved in a few days.

In the new subway draft the provision of the original bill, that the cost of relocating public utility pipes and conduits in connection with subway construction should be borne by the city and charged to the cost of building the tubes, has been changed to give the city the option of standing the expense and charging it to subway cost or to put the cost of the work on the utilities themselves.

In the local transit commission bill the Aldermen stood by their original plan of almost complete home rule by recommending a transit commission of five members, four to be appointed by the Mayor of Chicago and the other to be selected by the president of the county board of commissioners. In the bill initiated by the companies last summer the Governor was to have named two, the Mayor, two and the county board president, one.

The consolidation bill, as approved by the sub-committee, is practically identical with the original company measure, providing for the formation of a single transportation company to operate elevated, surface and bus lines and the subway system, when it is built. This bill would permit the elevated lines, which are incorporated under the state railroad act, to purchase and operate the surface lines and the bus lines, but would not give the same right to the street car company.

When the last two bills are approved by the sub-committee they will be submitted to the full local transportation committee, which will consider recommending them to the City Council for adoption. When the last-named group is presented with the drafts representatives of the railways and their bankers will be called in to reject, modify or accept the bills.

Boston Elevated to Open New Dorchester Line Nov. 5

Work is so far advanced on the building of the new Dorchester rapid transit line, which will be the newest part of the Boston Elevated system, Boston, Mass., that a part of it will be opened for service on Nov. 5. The Boston Transit Department, which is building the line, announces that the section from Andrew Square to Field's Corner will be ready for service on that date and has petitioned the Public Utilities Department to authorize the New York, New Haven & Hartford Railroad to close the Savin Hill station on Nov. 1 so that the Boston Elevated Railway may turn the power into the third rail on that date and allow the Elevated officials and employees three days to try out the new line and familiarize them-

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selves with the signals, curves and station platforms before carrying any passengers. There will be an official inspection of the line on Nov. 4.

This is the section, a third-rail rapid transit line, which will take the place of the steam railroad, the right-of-way having been bought from the New York, New Haven & Hartford Railroad, which is to abandon the passenger service when the new line is built so that the Boston Elevated can take it over. In planning for this extension of the Elevated system it has been assumed that the short-haul suburban passenger traffic can be handled more economically by a railway than by the steam railroads. The railroads coming into Boston have been talking about abandoning the suburban service.

Fare Hearings on California Petitions Set for Dec. 6

The hearing before the California Railroad Commission on the application of the Pacific Gas & Electric Company for a 7-cent fare in Sacramento, Cal., was resumed on Sept. 28. Considerable data were submitted on the valuation of the system and cost of operation of cars. Resumption of the hearings has been set for Dec. 6.

This date was made to allow for time to study the exhibits filed by that company and by the Central California Traction Company, San Francisco, Cal., which also is petitioning for an increase to 7 cents. The city is fighting the proposed increase of 2 cents on the lines within the city, while the district attorney's office is interested in the increase on the railway company's lines which run outside the city limits.

Citizens Abandon One-Car Road

Three weeks of trying to run a railway and make it pay is enough for the citizens of the little town of Philley's, Ind., so they have returned the line to its original operators and are retiring to less arduous occupations.

The town of Philley's adjoins the city of Fort Wayne on the southeast and is located on the interurban line running between that city and Decatur. When the Indiana Service Corporation, which has operated the insolvent Fort Wayne & Decatur Traction Company for some time, recently decided to abandon the service to Decatur the residents of Philley's were greatly incensed. So the Indiana Service Corporation turned over to the Philley's Community Association that portion of the line between Philley's and Fort Wayne and gave them a single street car to operate. The line was leased to the community with the understanding that it would be operated and maintained by the citizens, at a rental of $1 a year.

After several weeks of operation, however, the amateur utility men discovered the receipts were insufficient to pay the lone motorman so the line was handed back to the company and will soon be abandoned.

Council Heckling Tacoma Company

The City Council of Tacoma, Wash., recently passed a resolution directing the Tacoma Railway & Power Company to pave between its tracks on McKinley Avenue from 40th to 64th Streets and to complete its double tracking between 35th and 40th Streets on McKinley Avenue. The Council was advised by Corporation Counsel E. K. Murray that it was justified legally in taking such action. The company planked between its tracks according to an agreement with the city in 1921, which permitted planking in view of double tracking, and the company was to pave when financially able to do so. The resolution was adopted after frequent complaints had been received by the city from residents on McKinley Hill over the condition of the planking.

The Council also instructed the company to pull up the remainder of its tracks on Commerce Street. This work was halted due to an altercation over whether the ties should come up too after the company had completed the distance between Seventh and Ninth Streets.

A letter from Richard T. Sullivan, manager of the company, held that the Council's interpretation of the agreement to pave between 48th and 56th Streets on Yakima Avenue was unfair, and the company withdrew its consent to pay for any portion of it.

Jitney Decision Awaited in Columbia

Columbia's railway case, more or less in the public eye since last March, when the cars operated by the Columbia Railway, Gas & Electric Company were withdrawn, is now before the State Supreme Court.

Some time after this action by the company in suspending operations the Attorney-General instituted mandamus proceedings requiring the resumption of service. Several "intervenors" added their petitions to that of the Attorney-General. Among them were the Columbia city school board, the towns of Arden and Eau Claire (suburbs of Columbia and heretofore served by the railway), Columbia College, land development companies and others. All of these contend that the discontinuance of railway service is injurious to the city's welfare, that the street car is the best and cheapest mode of transportation and that the utility is under obligation to continue service despite the fact that it makes no money.

The company's position is that it lost money steadily during the latter several months of its operations and that to force it to operate would mean still further loss.

The Supreme Court, after hearing the case, has taken the petition for a mandamus under advisement and will likely hand down a decision soon.

At present the city is served by two systems of public transportation—neither very satisfactory. Buses operate on definite routes and are supposed to run on schedule. Their fare is 10 cents and they are not heavily patronized. Ten-cent jitneys operate without any regulation. They cover no definite route and go off the streets when they are so disposed to take passengers to their doors or to their offices. These vehicles are fairly well patronized. The jitneys are privately owned, some transfer only whites and others only negroes. Practically 95 per cent of them are Fords. The licenses for the jitneys change hands often.

One-Man Operation Extended by Connecticut Company

One-man car operation has been extended by the Connecticut Company at New Haven to the Lighthouse line, the Branford and Stony Creek runs, Momauguin and to the Country Clubs. This leaves two-man car operation on the Shelton Avenue line, the Winchester-Grand Avenue, State-Congress Avenue, New Haven - Waterbury, Dixwell Avenue-Savin Rock, and the Bridgeport runs. It is expected that these lines will follow into the one-man class before many months, for it is understood to be the intention of the company to operate 100 per cent of the cars in New Haven with one man. With the operation of one-man cars on the Branford, Stony Creek, East Haven and Momauguin lines a new system for fare collection went into effect. On eastbound trips from New Haven passengers pay as they leave the car. Passengers boarding cars beyond the first fare limit receive identification checks to show the number of the fare limit in which they have boarded the car. On the westbound trips to New Haven passengers, as they enter the car pay full fare from the point they board the car to their destination, and receive identification checks showing the number of the fare limit through which they have paid. Passengers return the identification checks to the operator when they leave the car. Passengers without checks are obliged to pay full fare to the point at which they leave the car.

Co-operation Between Savannah Utility and Education Board

The Savannah Electric & Power Company, Savannah, Ga., will co-operate with the Board of Education to consider transportation problems for pupils who live outside the city limits. Out of a recent meeting came a definite proposition for the making of a school survey of Chatham County. The company agreed to submit figures for the employment of a special car to carry the children from the Fort Wentworth section into the city and carry them back after school hours. As soon as these figures are obtained the committee will hold another meeting and formulate a report to the Board of Education.

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$30,000 Toward Portland Viaduct

The Oregon Electric Railway is to pay $8,000 toward the cost of a $30,000 viaduct over its tracks at Roland Street in Portland, Ore. The agreement specifies that the amount will be paid in full by the company within ten days after notification by the city engineer that the viaduct has been completed, the company to be free of all liability of the railway toward the structure.

Oakland Hearing to Be Resumed on Nov. 2

The hearing before the Railroad Commission concerning permanent rates for the local and transbay lines of the Key System Transit Company, Oakland, Cal., will be resumed by Commissioner Clyde Seavey on Nov. 2. The arguments have been held from time to time, and at the last hearing the Key System broached a plan for a "pass" system with a 10-cent cash fare. This matter is still under consideration.

Would Dismiss Suit for 5-Cent Fare in Philadelphia

Motions were filed in U. S. District Court by the Public Service Commission and Philadelphia Rapid Transit Company, Philadelphia, Pa., for dismissal of the equity suit for restoration of the 5-cent fare. The motion is based on grounds that the federal court has no jurisdiction in the case, and for the further reason that the fare advances, approved by the Public Service Commission, were consented to by the parties to the 1907 city-P.R.T. agreement.

"Vepcovian" Will Appear in Richmond

The November issue of the magazine published for employees of the Virginia Electric & Power Company, Richmond, Va., will appear under the name *Vepcovian*, it has been announced by A. H. Herrmann, the editor. A contest was held to secure a name for the publication, and *Vepcovian* won in a field of 900 entries. J. Morris Hardy, Norfolk, an employee of the accounting department of the company, won $10 in gold for the suggestion.

Out for Prizes in Jacksonville

Employees of the Jacksonville Traction Company, Jacksonville, Fla., announced recently that they would compete for the prizes to be offered to the Stone & Webster, Inc., owned or managed property in Georgia and Florida, which shows the most efficiency in keeping cars in repair while in service. The winning company must lower the record established for the smallest number of street cars which are brought into the shops for repairs while in service. Awards will be made by Alba H. Warren, district manager in Savannah.

Kansas City "Dad" Retires

"Dad" Nelson, veteran motorman at Kansas City, Mo., recently retired after 42 years of service. Almost a half century ago he entered railway service as a gripman for the old Kansas City Cable Railways. The *Railwayan*, the official paper of the Kansas City Public Service Company, states that his leaving brought many expressions of regret. It said that twice in his street car career he was responsible for the saving of the lives of his passengers. "Dad" is 79 years old, but appears much younger.

Employees Can Tip Company Off on British Columbia Business

"How the Employee Can Help," which appeared in the July issue of the British Columbia Electric employees' magazine, has been reprinted in pamphlet form, inside of which is the new business form designed to secure new business for the company. On this form employees can give any information they want on prospective customers for chartering coaches or cars, for parcel express by rapid transit and for electric railway freight services.

Examiner Reports Against Piedmont Project

An Interstate Commerce Commission examiner has recommended in a tentative report that the commission deny the application of the Piedmont & Northern Railway for authority to construct a line of railroad from Spartanburg to Gastonia, S. C., a distance of 53 miles, and another line from Charlotte to Winston-Salem, N. C., a distance of about 75 miles. The examiner held the proposed construction would result in an unwarranted duplication of existing railways, would impair their facilities by diverting their traffic, would not open any through routes that are not now available and would perform no transportation service of importance that cannot be performed by lines that now exist.

The commission will pass upon the recommendation before making a final decision. The Southern Railway and other carriers protested that the line was unnecessary and further asserted that the Duke power interests, controlling the Piedmont company, desired to build the railroad largely for the purpose of controlling traffic.

The Piedmont company contended that it had projected its extension prior to the passage of laws under which the commission controls railroad consolidation and, further, as an electric interurban, it was not under the commission's supervision. Both of these claims were held invalid by the examiner's ruling.

Planners to Study Route in Oklahoma City

Members of the City Planning Commission of Oklahoma City, Okla., are studying the route of the proposed belt line railway for the city. The plans were recently submitted to that commission by Hubert Hudson, president of the Oklahoma Railway. Mr. Hudson said it was desirable for the city to take sufficient time to study the plans.

Chicago Utilities Operate Radio Stations

Local and interurban transportation companies and other public utilities in the Chicago, Ill., metropolitan area under the management of Samuel Insull and associates have purchased and are now operating two local radio broadcasting stations under the slogan, "The Voice of Service to the Public." The stations, which are known as "WENR and WBCN," are operated by the Great Lakes Broadcasting Company, a newly created organization, owned and controlled jointly by the Chicago, North Shore & Milwaukee and the Chicago, South Shore & South Bend Railroads, Chicago Rapid Transit Company, Commonwealth Edison Company, the Peoples Gas Light & Coke Company, Public Service Company of Northern Illinois, Middle West Utilities Company and the Northern Indiana Public Service Company.

The two stations alternate broadcasting hours, thus making it possible to furnish continuous programs throughout the day. Both have been assigned the same wave length—228 meters or 1,040 kilocycles.

Morgan Eastman, formerly director of the Commonwealth Edison studio in Chicago, has been made manager of the two stations. He has a staff of well-known artists and announcers to aid in giving some of the best programs on the air. In addition famous radio entertainers from all parts of the country will be heard from time to time.

The "News" Established in Cincinnati

In order to keep the 15,000 citizens of the Cincinnati Street Railway City, Cincinnati, Ohio, informed as to what is happening in that city, the *News* made its appearance this month, and will appear every month hereafter. According to the first issue, it fulfills the promise made by J. B. Stewart, Jr., that there should be some means for the exchange of ideas and for keeping people acquainted all over the property. The editor is Marvin S. Gilbert. On opening up the fifteen-page pamphlet one sees the picture of Walter A. Draper, president of the Cincinnati Street Railway, and reads his hopes and ideas of "our new paper." He promises that personal items as well as business items will find a place in its pages.

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Five-Cent Fares for Miami School Children

Special 5-cent fare tickets for school children of Miami, Fla., will be honored on bus and railway cars operated by the Miami Beach Railway. They are purchasable in book form, containing 40, for $2. Applications signed by school principals will be distributed at the schools and must be presented upon purchasing the tickets.

One Pittsburgh Driver Speaks to Another

In a recent advertisement in the Pittsburgh *Post-Gazette,* the Pittsburgh Railways extended its appreciation to the taxicab and truck drivers of the city for the splendid co-operation they have shown in helping to minimize accidents to pedestrians and passengers. The railway "as one driver to another" warns the drivers not to run past open trolley doors at loading points and to remember that the trolley cannot deviate its course to avoid hitting an auto.

New Toledo Ordinance Being Drafted

Progress on a new franchise ordinance for Toledo following the basis of agreement arrived at between representatives of the Henry L. Doherty & Company ownership group and the Board of Street Railway Control for the city is expected to be rapid after the election in November. Company officials and attorneys are already busy drafting in a preliminary way the new ordinance. There is some hope that it may be put through and presented to the electorate before January or early in the spring at the latest. A considerable development of new bus service depends on the new ordinance, in which it is proposed to give the railway company a virtual monopoly of all city transportation for a number of years. Closer control by the public board and commissioner would also be provided under the new plan.

Providence Men to Receive Checks

The United Electric Railways, Providence, R. I., has abandoned its trolley pay car and will mail checks hereafter to its employees. Paymaster G. B. Merchant, who knew the 2,400 employees so well, will no longer ride the cars with from $12,000 to $80,000 twice each week in his care. The ever-present bandit menace has forced a change from the 30-year old method.

Loops to Be Constructed in Buffalo

Attempts on the part of the Buffalo municipal authorities to prevent the International Railway, Buffalo, from constructing loops at the two ends of the Fillmore-Hertel line, which would enable the company to establish one-man car service on this line, the last route in the city to use two-man crews, failed when Supreme Court Justice Horton authorized the railway to construct the loops.

The permit was granted by the court by dismissing the stay granted the city some time ago pending an appeal to the higher courts. The Appellate Division dismissed the application of the city of Buffalo to enjoin the railway on the ground of legal errors. For several weeks city police have been posted at both ends of the line with orders to arrest any employee of the company who attempted to start the construction of new tracks. Henry W. Killeen, of counsel for the railway, says the conversion of the line from two-man crews to one-man cars will save the International Railway $64,000 a year.

Efforts to Collect $25,000 for Restoration of Hocker Line

Reports have it that efforts will be made in Merriam, Kan., to raise the $25,000 needed to reconstruct the Hocker Interurban Line and to re-establish electric railway service between Zarah and Kansas City, Mo., in accordance with the plan of Herman Sonken, president of the Sonken-Galamba Company, which purchased the line at sheriff's sale on Aug. 27 with the intention of junking it. Mr. Sonken said he believed the line could be operated at a profit under favorable conditions and that he was willing to wait a while before junking the line. He estimated that it would cost about $25,000 to place the line in operation again, as much repair work would be necessary. The Kansas City, Lawrence & Topeka Electric Railroad, the official name for the Hocker line, operated 21 miles.

"We Have Among Us —"

In the guard of honor to greet Colonel Lindbergh on his arrival in Los Angeles, Cal., was conductor Leonard C. Price, Division 1 of the Los Angeles Railway. He was selected because of his excellent overseas record. With nine other Legionnaires he escorted "Lindy" to the Coliseum on Sept. 20.

Eight Cents in Phillipsburg

To offset a deficit said to be increasing each year, the Phillipsburg Transit Company, Phillipsburg, N. J., has been granted permission by the Board of Public Utility Commissioners of New Jersey to charge an 8-cent fare, effective Oct. 9. The old fare was 7 cents. The schedule calls for the sale of two tokens for 15 cents, and weekly passes entitling the holders to an unlimited number of rides for a period of seven days are offered at $1.25 each. Children between five and twelve years old are carried for 5 cents, providing tickets are bought from the company in strips at the rate of twenty for $1.

Excess Fares Cannot Be Collected by Missouri

Federal Judge Faris in St. Louis on Sept. 30 denied the State of Missouri the right to sue Receiver Rolla Wells of the United Railways, St. Louis, Mo., for $85,000 excess fares which car riders paid during the period Feb. 5 to March 28, while the company was charging an 8-cent fare under the protection of a federal court restraining order. He held to the law that the state cannot sue to collect debts due individuals when those individuals fail to press their own claims, but under the escheat statute it may sue to collect claims of individuals which have been reduced to judgments. The court pointed out that during the extra-fare period the company had issued refund script to passengers. These scripts covering the excess fare were redeemable within 60 days after the return to the lower fare, and if the car riders failed to collect the excess fares due them that was their individual right, and the state could not collect the money.

Proposes Shortening Line in New York State

Following a traffic census of the bridge across the Hudson River at South Ferry Street connecting Albany and Rensselaer, N. Y., which confirmed the opinion that the bridge had reached its traffic capacity, the State Department of Public Works has requested the Eastern New York Utilities Corporation to terminate its Albany-Hudson railway lines at Rensselaer instead of at Albany. This would provide for additional space for vehicular traffic by the removal of tracks from the structure.

Officials of the company have indicated that the proposal will not meet with their approval. Use of the bridge by the cars of the United Traction Company was discontinued some time ago with the substitution of bus service for Rensselaer.

Holyoke Changes Deferred

Because of the continued objection to the proposed increase in fare rates by the Holyoke Street Railway, Holyoke, Mass., the Public Utilities Commission suspended operation of the proposed changes to Oct. 15. Previously the commission had suspended the date to Oct. 1. Inability of objectors in Holyoke and Chicopee to prepare their case was given as the reason for the delay.

Despite the postponement, as much of the business as possible was taken care of at the recent hearing. President Louis D. Pellissier and Counsel William H. Brooks presented the case for the railway.

In addition to objectors from Holyoke and Chicopee, C. W. Cavanaugh appeared for the people of South Hadley. He said it was the feeling in that section that the time was most inopportune for fare increases. He thought the people should ride as cheaply in South Hadley as in Holyoke.

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Recent Bus Developments

Buses Between Jefferson City and North Jefferson

Abandonment of a railway line operated by the Missouri Power & Light Company between Jefferson City and North Jefferson, Mo., including tracks on the Missouri River toll bridge at Jefferson City, was authorized on Sept. 29 by the Missouri Public Service Commission. The company was authorized to operate a bus service between Jefferson City and the railroad station in North Jefferson.

Buses have been in operation three or four months under a temporary order. The fare for the 2½-mile car trip across the river to North Jefferson has been 30 cents, including the bridge toll, and the same rate was authorized for the buses.

Philadelphia Rural Transit Would Extend Line

Representatives of the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, Philadelphia, Pa., appeared before James S. Benn of the Public Service Commission recently to ask approval of an agreement entered into between it and the Doylestown & Easton Motorcoach Company, providing for the operation of the latter corporation by the Philadelphia Rural Transit Company. C. C. Schaeffer, traffic engineer, explained that at the present time the applicant operates buses between Philadelphia and Doylestown, and the other company from Doylestown to Easton. The agreement provides for the operation of a line from Philadelphia to Easton, the equipment to be furnished by the Philadelphia Rural Company. The fare is to be $1.85 each way. The application was referred to the entire commission for final action.

Objection to Kansas City Buses Fails

The objection of the Warwick property owners to the operation of Warwick buses on that street in Kansas City, Mo., faded Sept. 28, when leaders in the dispute failed to organize an association for the benefit of Warwick property owners. The Warwick property owners could not agree upon the new organization, nor upon whether they wanted last year's paving tax cut or the buses of the Kansas City Public Service removed. After the failure to organize, the entire plan fell through.

Fred G. Buffe, general manager of the Kansas City Public Service Company, in a statement on Sept. 24, said that the question of continued operation of buses on Warwick Street was a matter for public and city officials to decide. The bus line was operated in compliance with the bus franchise. It never had paid operating expenses and really was operated as a convenience to the people of the district served.

Lines Planned in Utica

The Utica Railways Co-Ordinated Bus Line, Inc., applied on Sept. 27 to the Public Service Commission for a certificate for the operation of a bus line from James and Dominick Streets in Rome, over five streets, under consent given by the city. The company plans to use two twenty-passenger buses and the rate of fare will not exceed that charged on the railway lines. Application was also made to the Public Service Commission for permission to operate a bus line from Baggs Square in Utica to the Cemetery loop, and returning over the same streets. The operation is to be under a city consent, dated Sept. 23, the company stipulating not to charge fares in excess of those charged on the railway.

Bus Proposal Renewed in Miami

The Miami Beach Railway, Miami, Fla., will apply again for a bus system permit at Miami Beach, revising the schedule for which City Manager C. A. Renshaw refused a permit because the plan was considered inadequate and curtailed the service started a month ago.

The only other permit application filed, as required by the city ordinance passed a month ago, is that of the Intercity Transportation Company, composed of 29 jitney drivers. This application has not been acted upon by the city. Officials of the jitney corporation say they have leased a terminal lot at South Beach, from which they will operate the intercity lines if the city refuses a permit. Their application offers a ten-minute schedule from Miami to South Beach and twelve-minute service from Miami to North Beach.

Peru Saved from Unwarranted Competition

The death knell of intracity buses in Peru, Ind., in so far as their operation in competition with street cars is concerned, was sounded recently when the City Council voted to instruct the ordinance committee to draft a new bus ordinance under which buses will be required to operate only on streets where there are no street car lines. Previous to the vote a resolution from the Peru Chamber of Commerce recommending that such an ordinance be passed was read. Threats of the Indiana Service Company to withdraw city service is believed to have prompted the Council to rule against the buses.

Bus Line to Supply Service in Glens Falls

L. F. Loree, William H. Williams, officials of the Delaware & Hudson Railroad, and H. B. Weatherwax, Albany, N. Y., vice-president and general manager of the United Traction Company, are the incorporators of the Hudson Transportation Company, Inc., Glens Falls, chartered on Oct. 6 by the Secretary of State, with a capital of $100,000. The new company, it was stated at the offices of the United Traction Company, would operate a bus line in the city of Glens Falls, N. Y., to take the place of service formerly supplied by the Hudson Valley Railroad, the abandonment of whose railway lines was authorized by the Public Service Commission a short time ago.

Expansion in Fort Worth Planned

The Northern Texas Traction Company, Fort Worth, Tex., through its manager, A. F. Townsend, has petitioned the Texas Railroad Commission for permission to purchase the Harvey Bus Line running between Weatherford and Fort Worth. The new line will cooperate closely with the Texas Motor Coaches, a bus line running between Fort Worth and Dallas, recently purchased from the Red Ball Company by R. E. Harding and other men of Fort Worth, in which Stone & Webster is also interested.

Hearing on Purchase of Peoples Coach at Indianapolis

A hearing was held recently in Circuit Court in Indianapolis, Ind., on a petition of the Indianapolis Street Railway for approval of the purchase by that company of the Peoples Motor Coach Company for $500,000. The court's decision will be announced later.

The hearing was an appeal from a ruling of the Indiana Public Service Commission, which denied the petition last spring and is the first appeal taken under an act passed by the 1927 Legislature, which provides for procedure of this nature. The city legal department offered no opposition to the purchase, the corporation counsel claiming that city officials feel there should be only one transportation company in operation.

Attorneys for the local electric railway informed the court that the petition should be granted, as it would permit improvement in service and argued that the purchase price was not unreasonable.

Arthur L. Gilliom, Attorney-General, did not appear in court to represent the Public Service Commission. He ex-

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plained that the law under which the appeal was taken did not make the Public Service Commission a party to the petition. Should the Circuit Court judge reverse the ruling of the Public Service Commission, he would notify the commission and give the commissioners an opportunity to change the ruling. If the commission refuses to alter its ruling, the court then has power to grant the appeal and authorize the transaction.

Bus Permit Between Danville and Springfield Sought

The Illinois Power & Light Corporation has applied to the Illinois Commerce Commission for permission to operate buses between Danville and Springfield, Ill. Harry Payne, generai division superintendent of the corporation, indicated that establishment of the bus service would probably mean greater co-ordination of motor vehicles with interurban carriers.

Buses on Lakewood Line in Jamestown

A declaration of abandonment of the Lakewood line of the Jamestown Street Railway, Jamestown, N. Y., operating between Jamestown and Lakewood, N. Y., was approved by the Public Service Commission on Oct. 6. At the same time a certificate of convenience and necessity was granted for the operation of a bus line by the Jamestown Motor Bus Transportation Company, a subsidiary, to provide service in the territories to be abandoned by the railway. The abandoning of the railway will do away with a grade crossing of the Erie Railroad tracks, the bus company planning so to operate its line that the railroad will not be crossed.

Evidence presented at the hearing showed that the company would not be justified in trying to finance the work needed to be done to rehabilitate the railway. There was no opposition to the railway abandonment provided bus service was arranged.

Sea Side Bus Line Passes to Railway

After prescribing certain conditions as to the transfer of an indebtedness, the Board of Public Utility Commissioners of New Jersey on Oct. 8 approved the sale of the property, franchises and equipment of the Atlantic Coast Transportation Company to the Coast Cities Railway. The trolley line extends from North Long Branch through various municipalities to Sea Girt. The transportation company operates a bus line through the same general territory, but skirting the ocean closely, extending, however, south to Manasquan and in addition serves the outlying territory west of the general route of the main line. Both properties have been under the same financial control.

Financial and Corporate

Increase in Illinois Business

The Chicago & Joliet Electric Railway, operating cars and buses, carried 2,171,740 passengers and the Illinois Traction System 226,764 passengers through the Joliet, Ill., terminal in the summer season of June, July and August. More than half the Chicago & Joliet total represents city service traffic in Joliet, while nearly 400,000 others rode the buses. The establishment of a connecting link in Joliet between downstate centers and Chicago was responsible for the great increase in business, officials explained.

Bondholders Buy Boston & Worcester

An offer of $360,000 for all the property of the Boston & Worcester Street Railway was submitted at the foreclosure sale at Framingham, Mass., on Oct. 11 by Henry D. Rising of Boston, representing the bondholders' protective committee. The sale was conducted by Franklin P. Miller, receiver, and Mr. Rising's bid was the only one received. The sale is subject to confirmation by the Supreme Court at Boston. If it is confirmed the bondholders' committee plans to take possession of the property early in November and continue operations.

Offer Made to Winnipeg Stockholders

Stockholders of the Winnipeg Electric Company, Winnipeg, Man., will be offered rights to subscribe to 40,000 shares of additional common stock at $60 a share, on the basis of four new shares for each eleven held, on Oct. 15. Manitoba Power Company, Ltd., controlled by the Winnipeg Electric Company, is expected to double its common stock of 200,000 shares at a stockholders' meeting on Nov. 10. The company intends to issue 50,000 shares of this stock to shareholders at $60 a share in the ratio of one share for each two held.

A. W. McLimont, president of the Winnipeg Electric Company, stated that earnings of the Manitoba Power Company, Ltd., have reached the point where a dividend is warranted and it is the intention of the directors to declare it.

Sale Date Set for New Jersey Property

Charles F. Lynch, special master appointed by the United States District Court, will sell the holdings of the Morris County Traction Company at public sale on Oct. 31. The sale will be held at Morristown and is on a bill of foreclosure brought by the People's Savings & Trust Company, Pittsburgh, Pa. The sale will comprise auto buses, the franchise, real estate and interests in land held by the company in Morris County. The company has 43.60 miles of track, 47 trolley cars, nine buses, snow plows, flat cars and tools. In all there are 122 tracts of land, in Union and Morris Counties.

Abandonment on Joplin City Line Sought

The Southwest Missouri Railroad, Webb City, Mo., has applied for permission to take up its city service lines in Joplin, Mo., and discontinue service other than on the main line. Officials in seeking discontinuance state that these lines are being operated at a loss. The railroad is now under a receivership. The city of Joplin will oppose the abandonment.

Smallest New York Car Line Would Quit

The shortest car line in New York City, namely, the Van Brunt Street & Erie Basin Railway, operating about a mile of track from Hamilton Ferry to Erie Basin, Brooklyn, has asked Justice Carswell in Supreme Court, Brooklyn, to appoint a receiver so that the railway can file a petition of voluntary dissolution and go out of existence. The company is faced with financial difficulties and refers to a serious debt in the nature of a judgment of $10,040 obtained for personal injuries inflicted by one of the company's cars. Besides this, on a revenue of $140 a day, the company has been running up annual deficits for some time past.

Junior Security Holders Sue Chicago Railways Receivers

The suit of the trustees of junior securities of the Chicago Railway, Chicago, Ill., to compel receivers of the property to pay interest on the $37,866,000 of A and B consolidated mortgage and purchase money bonds was taken under advisement recently by Federal Judge James H. Wilkerson. Funds sufficient to pay the interest at 5 per cent from Feb. 1, the date the company's twenty-year franchise expired, to Aug. 1 of this year has been set aside by the receivers on the order issued by Judge Wilkerson early last summer, but no interest has yet been paid for the period.

Attorneys for the junior security holders in their petition contend that their bonds were considered in the ordinance of 1907 as special funds and as such should receive interest payments before or at the same time that interest is paid on the first mortgage bonds.

The suit of the junior security hold-

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ers is being opposed by the Harris Trust & Savings Bank, Chicago, trustee for the first mortgage bondholder, on the ground that first mortgage bonds are prior liens over all other outstanding securities of the company.

One-Mile Line in Pennsylvania Quits

The Huntington, Lewiston & Juniata Valley Traction Company, Huntington, Pa., abandoned service on Oct. 4. High cost of operation was given as the reason for the suspension. It was said that the cars were worn out and the company could not afford to replace them. The line is only 1 mile long.

A Michigan Interurban to Abandon Service

The combined efforts of the Benton Harbor & St. Joseph Railway & Light Company, Benton Harbor, Mich., the Benton Harbor Chamber of Commerce and civic organizations in communities served by the railway to revive patronage have met with little success. Officials of the railway recently announced that freight and passenger service would be abandoned on the interurban lines running between Benton Harbor and Watervliet and between Benton Harbor and Dowagiac. Approximately 40 miles of single track is affected. No definite date was given for the discontinuance of service, but the first step toward actual abandonment was taken when notices were posted of the cancellation of existing rate schedules on Oct. 30.

H. W. Wallsmith, general manager of the railway, remarked that the decision of the railway to cease operation of its interurban lines marked the end of an unsuccessful struggle against changed conditions brought about by the increasing use of trucks for short hauls and the growth of the automobile and bus as factors in passenger transportation. The company will continue to operate the local lines in Benton Harbor and St. Joseph.

8,463,338 Passengers Traveled in Westchester

Nearly 8,500,000 people traveled on the New York, Westchester & Boston Railway lines in Westchester, N. Y., during the first eight months of the current year, according to a traffic report made public recently by Leverett S. Miller, president. Daily travel on both eastern and western divisions has reached the record average of approximately 36,000 daily. The total of 7,561,310 registered during the first eight months of 1926 has been boosted during a similar period in 1927 11.94 per cent to a new record of 8,463,338. The month of August also set a new record, 1,073,347 passengers having been carried, which was a gain of 103,434 compared with August, 1926, which itself was a record-breaker. Passengers at the recently opened terminal at Harrison numbered 53,978 during August.

$581,700 Balance in Detroit

The city of Detroit, Department of Street Railways, income and statistical statements for the year ended Dec. 31, 1926, are as shown in the table below.

Approves Abandonment of Two New York Lines

A declaration of abandonment by the Hudson Valley Railway, Glens Falls, N. Y., of its Lake George-Warrensburg lines and its Greenwich-Thompson Lines received approval of the Public Service Commission on Aug. 29, following a rehearing given by the commission on its order dated March 3, 1927. At that time it denied approval of the company's petition to abandon these two lines. The amendment does not become effective until Jan. 1, 1928, and in the interim the commission will make a survey of the transportation facilities along and contiguous to the Hudson Valley Railway's entire line and then call a conference of representatives of the railway line and other public carriers, including bus lines, and representatives of municipalities to discuss and devise means of public transportation where unprofitable branches are abandoned by the railway. The order approving the proposed abandonment was based on a memorandum by Chairman Prendergast which was concurred in by Commissioners Pooley, VanNamee and Brewster. Commissioner Lunn voted against the proposal.

It was shown in the evidence that the Hudson Valley Company in 1926 sustained an operating deficit of $64,758 and, based on a complete analysis of the evidence and exhibits and actual experience, an operating loss of $5,974 was indicated for the Greenwich line and $13,492 for the Warrensburg line. These deficits take into consideration revenue from sales of power which, if excluded, would increase the deficits on the two branch lines to $11,245 and $13,618.

INCOME STATEMENT, DEPARTMENT OF STREET RAILWAYS, CITY OF DETROIT

	Year Ended Dec. 31 1926	1925
Income		
Operating Revenue:		
Railway operating revenue	$22,580,243	$22,413,689
Coach operating revenue	2,157,818	818,328
Total operating revenue	$24,738,061	$23,232,017
Non-operating income	268,528	184,273
Total revenue from all sources	$25,006,590	$23,416,291
Operating Expenses:		
Railway operating expenses	$17,055,022	$16,572,497
Coach operating expenses	2,083,942	786,557
Total operating expenses	$19,138,965	$17,359,055
Net revenue from all sources	$ 5,867,624	$6,057,235
Deduct:		
Taxes assignable to operation	$724,569	$705,615
Other deductions		935
Interest on funded debt:		
On purchase bonds	149,728	155,380
On construction bonds	785,875	785,875
On additions and betterments bonds	230,860	137,305
On purchase contract (D. U. R)	794,663	854,662
Total interest	$1,961,126	$1,933,224
Total deductions	$2,685,696	$2,639,774
Net income	$3,181,928	$3,417,461
Disposition of Net Income:		
Sinking Funds:		
For purchase bonds	$133,000	$133,000
For construction bonds	519,709	571,351
For additions and betterments bonds	160,000	358,798
For purchase contract (D. U. R.)	1,787,518	1,787,518
Total sinking funds	$2,600,227	$2,850,667
Balance for the period	$581,700	$566,793

STATISTICAL STATEMENT, DEPARTMENT OF STREET RAILWAYS, CITY OF DETROIT

	Year Ended Dec. 31 1926	1925
Railway revenue car-miles	53,109,845	52,863,111
Coach revenue coach-miles	8,977,267	3,529,795
Railway revenue car-hours	5,497,640	5,692,198
Coach revenue coach-hours	895,112	354,155
Railway revenue passengers	359,475,040	357,926,168
Railway transfer passengers	125,763,285	123,310,526
Railway total passengers	485,238,325	481,236,694
Coach revenue passengers	25,314,545	10,564,723
Coach transfer passengers	2,095,715	387,228
Coach total passengers	27,410,260	10,951,951
Total revenue and transfer passengers	512,648,585	492,188,645
Railway operating revenue per car-mile, cents	42.52	42.40
Coach operating revenue per coach-mile, cents	24.04	23.18
Railway operating expenses per car-mile, cents	32.11	31.35
Coach operating expenses per coach-mile, cents	23.21	22.28
Railway operating revenue per car-hour	$4.11	$3.94
Coach operating revenue per coach-hour	$2.41	$2.31
Railway operating expenses per car-hour	$3.10	$2.91
Coach operating expenses per coach-hour	$2.33	$2.22
Ratio of transfer passengers to revenue passengers—railway, per cent	34.99	34.45
Ratio of transfer passengers to revenue passengers—coach, per cent	8.28	3.66
Railway revenue passengers per car-mile operated	6.77	6.77
Railway transfer passengers per car-mile operated	2.37	2.53
Total railway passengers per car-mile operated	9.14	9.10
Coach revenue passengers per coach-mile operated	2.82	2.99
Coach transfer passengers per coach-mile operated	.23	.11
Total coach passengers per coach-mile operated	3.05	3.10
Ratio of railway operating expenses to railway operating revenue, per cent	75.53	73.94
Ratio of coach operating expenses to coach operating revenue, per cent	96.58	96.12

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Industries Expanding in Beaver Valley Territory

While gross receipts of the Beaver Valley Traction Lines, New Brighton, Pa., were less in 1926 than in 1925, the decrease is due principally to the loss of business incident to bridge reconstruction. However, certain charges assumed by a neighboring company brought net revenues to about the same as in the preceding year. This was the explanation contained in the annual report of the Philadelphia Company, the parent concern. The net deficit for the year was $8,044.

STATISTICS OF BEAVER VALLEY MOTOR COACH COMPANY

Routes operated	10.1
Route miles operated (single way)	16
Coaches owned	352,109
Revenue coach miles operated†	1,084,811
Passengers carried	29.28
Passenger revenue per revenue coach mile (cents)‡	9.16
Average fare per passenger (cents)	

† Includes special coach miles.
‡ Includes special coach revenue and mileage.

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE BEAVER VALLEY MOTOR COACH COMPANY FOR THE YEAR ENDED DEC. 31, 1926

Operating revenues		$108,861
Operating expenses:		
Maintenance of equipment	$12,508	
Traffic	584	
Transportation	54,354	
General administrative	5,380	
Other general	8,611	
Taxes	5,184	
Total		86,623
Net revenue from operations		$22,237
Income charge—Interest on unfunded debt		3,860
Net income before appropriation		$18,377
Appropriation for depreciation		23,031
Deficit for the year		$4,654
Deficit, Jan. 1, 1926	$7,484	
Deficit credits—Miscellaneous (net)	4,526	
Total		2,958
Deficit, Dec. 31, 1926—Per balance sheet		$7,613

The Beaver Valley is a rapidly growing industrial section, owing its advance to the development of diversified industries; and as the electric railway serves the territory for an expanse of 20 miles, the prospects appear to be improving. Established industries are expanding and the communities in the valley are growing at a rate scarcely exceeded in any other part of the Pittsburgh district. With the completion of many of the highway improvements in 1927, it is expected that restored communications will favorably affect the revenues during the year.

In November, fourteen employees had completed a 25-year record of continuous service and were awarded engraved watch charms. A twenty-year club has been organized.

The Beaver Valley Motor Coach Company's revenue of $108,861 increased 25 per cent over the previous year, due largely to the change in service at Leetsdale from street cars to coaches, and also to temporary conditions. Operating expenses, excluding depreciation, for which a relatively large sum was reserved, increased $4,102 and although there was a sharp rise in taxes, net earnings from operations amounting to $22,237 increased $17,886 over 1925.

With the completion of the rebuilding program affecting bridges and streets and the resumption of normal operating schedules, it is expected that the system of motor coach lines in the Beaver Valley will become a factor of importance in the transportation facilities of that section. The lines are primarily intended to serve as anxiliaries to the electric railway lines and the service is co-ordinate.

SUMMARY OF CONSOLIDATED INCOME AND PROFIT AND LOSS FOR YEAR ENDED DEC. 31, 1926, BEAVER VALLEY TRACTION COMPANY AND PITTSBURGH AND BEAVER STREET RAILWAY

Gross revenue from stree railway operations		$597,038
Operating Expenses:		
Maintenance of way and structures	$66,794	
Maintenance of equipment	34,330	
Traffic	8,622	
Power	70,343	
Transportation	134,206	
General administrative	57,607	
Other general	48,969	
Taxes	14,964	
Total		435,839
Net revenue from street railway operations		$161,199
Auxiliary Operations:		
Operating revenues	$5,533	
Operating expenses	6,112	
Net loss from auxiliary operations		578
Net revenue from operations		$160,621
Non-operating revenues:		
Rental of real estate and buildings	$887	
Interest from investment securities	385	
Interest from other sources	100	
Miscellaneous	4,862	
Total	$6,235	
Non-operating expenses	551	
Net revenue from other operations		5,683
Gross income		$166,305
Income charges:		
Rent of leased properties	$4,475	
Interest on funded debt	119,100	
Interest on unfunded debt	36,032	
Total		159,597
Net income before appropriations		$6,707
Appropriations:		
Depreciation	$13,448	
Amortization of debt discount and expense	1,304	
Total		14,752
Net deficit for the year		$8,044
Deficit, Jan. 1, 1926		482,298
Miscellaneous debits (net)		33,378
Deficit, Dec. 31, 1926—Per balance sheet		$523,721

STATISTICS OF THE BEAVER VALLEY TRACTION COMPANY AND PITTSBURGH & BEAVER STREET RAILWAY

Miles of road		25.30
Miles of track		42.06
Cars	Passenger	38
	Miscellaneous	7
Total cars		45
Car miles operated		1,573,527
Passengers carried	Revenue	11,429,625
	Transfer	555,371
Total passengers carried†		11,984,996
Passenger revenue per (revenue) car-mile—cents		37.53
Passenger revenue per total passenger carried—cents		4.92

† Excluding free passengers.

Lincoln Depreciation Allowance Reduced

The Nebraska Railway Commission has reduced the amount of maintenance and depreciation which the Lincoln Traction Company, Lincoln, has been compelled to set up on its books, in recognition of the fact that abandonment of car lines has greatly reduced the investment in physical property and the cost of repair and replacement. Buses have been substituted in each case where a car line has been eliminated and the set-up required for them is much less. The company is still suffering a loss of about $1,000 a month in revenues compared with a year ago, but the increase in the number of buses has been materially reducing the figure. Managing officials say that the smaller set-up for depreciation will enable the company to add enough to its net revenues to take care of its bond interest this year.

Colorado Property Valued

The Grand River Valley Railroad, electric line, operating between Grand Junction and Fruita, Col., was given a tentative value on Sept. 12 of $260,250 by the Interstate Commerce Commission. This figure is of June 30, 1919.

Car Line Bought by San Francisco Business Men

Merchants of Montgomery Street sent a check for $18,000 to the Market Street Railway, San Francisco, Cal., for the car line on that street. It was the final gesture in the long campaign to remove the car tracks from Montgomery Street so as to make way for the needs of modern traffic. This is in line with the purpose of the organization to make Montgomery Street a financial stronghold of the Pacific Coast.

Claims Hold Up Ratification of Binghamton Sale

Claims of the city of Binghamton, N. Y., against the Binghamton Railway for more than $200,000 for paving work will have to be settled before the sale of the company is ratified by the court. This was the advice given Corporation Counsel John J. Irving by the United States Court in Albany.

Assistant Corporation Counsel Ray represented the city in the court fight to have these claims made a prior lien over the first mortgages, and claims amounting to $182.599 were included in the report of Special Master George F. Lyon. There is now included in this preferred list an estimate of $43.000 for paving. The railway claims an offset to a part of these charges on account of expense in connection with change in track to accommodate sewer laying. The court holds the claims must either be paid by the railway before the property is sold or else the property must be sold subject to these claims, which precede mortgages or other liens.

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Readjustment Plan for West Chester Property

A plan and agreement for the readjustment of securities of the West Chester Street Railway, West Chester, Pa., and which provides for the exchange of new securities for old securities without the payment of any cash on the part of the security holders has been adopted by a committee. The plan involves the company's first mortgage 5 per cent gold bonds, due Aug. 1, 1932; first lien and collateral trust sinking fund gold bonds, series A, 6 per cent, due Oct. 1, 1939; 7 per cent participating cumulative preferred capital stock, common capital stock and secured promissory notes.

An invitation has been extended by the committee to all holders to deposit their securities at an early date. O. Howard Wolfe, cashier Philadelphia-Girard National Bank, is chairman of the committee. The company has total assets of approximately $3,000,000.

Payment Period Extension in Seattle in Hands of Committee

By a vote of five to four, the City Council of Seattle, Wash., recently adopted Councilman A. Lou Cohen's resolution for appointment of a committee of three to negotiate with representatives of the Puget Sound Power & Light Company, the Old Colony Trust Company of Boston and the Boston Safe Deposit Company with the intention of taking a hand in the negotiations with Stone & Webster interests for an extension in the payment period for the remaining $10,000,000 of the $15,000,000 purchase price of the Seattle Municipal Railway. The committee appointed by Council President John E. Carroll are A. Lou Cohen, Oliver T. Erickson and E. L. Blaine. This committee will act in conjunction with Mayor Bertha K. Landes, who has been conferring with A. W. Leonard, president of the Puget Sound company.

Electric Bond & Share Acquires South American Properties

The acquisition of utilities in Brazil, Colombia, France, Japan and other foreign countries by the Electric Bond & Share Company, New York, N. Y., costing $36,417,597, was announced on Oct. 3, and a proposal of their transfer to the American and Foreign Power Company, Inc., a subsidiary. The cost includes annual interest at 6 per cent from date of expenditure to Oct. 1 and $350,000 in overhead expenses. Shareholders of the subsidiary will vote on the proposed transfer at their annual meeting in Augusta, Me., on Oct. 18.

Brazilian acquisitions of the Electric Bond & Share include railway companies in Petropolis, Bahia and Victoria. The new acquisitions of the Electric Bond & Share Company have been vested with the South American Power Company, a Florida corporation.

Book Reviews

Your Money's Worth

By Stuart Chase and F. J. Schlink. New York, N. Y.: Macmillan Company. 286 pages. Price, $2.

"What fools these mortals be" can be applied to the majority of consumers who spend a dollar and receive 25 cents worth. The American's gullibility for advertising misrepresentation, label mysteries, short weights and measures and his complacency and lethargy in wiping out quackery in general have been made the subject of serious study by these two explorers of hokum. Their findings are offered very frankly in "Your Money's Worth." Many things have been debunked within the past few years, but the reader in this instance will be more amenable to the indictments as he will not feel that the authors have an axe to grind or a product to sell. Rather do the authors point the way out of this wonderland of advertising mystery and illusory products to a terra firma of frank if less colorful sales propaganda where the trial and error method, so futile and so costly, is unknown.

Against this widespreading adulteration and fraud there is little in the way of protection for products other than food and drugs. In cement and certain electrical equipment voluntary standards have been nationally accepted. Certain transportation equipment, especially in motor car parts and materials, must conform to standards, including those of safety. Simplification has been a first aid in the buyer's buying.

In paving brick alone, a commodity used very generally in the railway business, the variety has been reduced from 66 to four, with an annual estimated saving of $1,000,000.

Buying from specification, however, to aid the consumer needs more coordination and more direct release of information. There are governmental outposts, such as the Federal Trade Commission, Bureau of Standards and the United States Navy, where laboratories are in operation as well as private outposts such as the General Electric, the Westinghouse and the United States Steel, which operate with splendidly equipped research facilities, but it is the intermediate consumer who is benefiting and not the ultimate consumer to any great degree.

A cure for this unhealthy economic condition can be found, according to Messrs. Chase and Schlink, in a definite interest on the part of the community toward organized pressure to get money's worth. Besides asking advertisers to produce scientific facts upon which their claims are based, they offer about 50 suggestions to the man about to buy. If only science could displace magic in salesmanship the authors believe that the whole curve of consumption would change.

This book is a "plea for a genuine science of buying and consuming." Against H. L. Mencken's theory that the average citizen is desolute without his daily dose of bunkum, the authors say that a greater man than he "founded his life on the principle that you 'cannot fool all the people all of the time.' "

Business Without a Buyer—

By William Trufant Foster and Waddill Catchings, Pollak Foundation for Economic Research. New York, N. Y.: Houghton Mifflin Company. 205 pages. Price, $2.

A pleasant and profitable evening is offered the American business and industrial man through "Business Without a Buyer," a theory for the smoothing out of the business cycle expressed in the language of the layman. Why, with all this progress of increased wages, high technical attainments and better living conditions, has this "cycle of business" not been smoothed out and "depression" and "prosperity" softened into "good times" and "better times"?

The authors answer this question with a theory based upon five facts: First, our vast production resources are not used at any approach to capacity; second, we do not produce at capacity because we fear we cannot sell the goods at prices which will make continued production possible; third, we cannot sell the goods because the consumer does not have a sufficient income; fourth, the consumer does not have sufficent income to buy because the manufacturing processes do not allow a money profit sufficient for the consumer to buy the goods, and the people, under the impelling necessity of saving, cannot spend even as much money as they receive, and, fifth, since business can be prosperous only when there are buyers, and since our present system limits both the number of buyers and their capacity to purchase goods, then the solution of the problem lies in an adequate income to the consumer, which in addition to what he may save will allow him to buy all the finished products as rapidly as they are put on sale. Here are points on the possible solution of America's economic problems.

Electrification of Sydney and Suburban Railways

Reprint of the Institution of Engineers, Australia, Transactions, Vol. VII, 1926. 382 pages.

This is a series of papers presented before the Institution of Engineers, Australia, at Sydney, August to December, 1926, with maps, illustrations, drawings and index. Among the subjects discussed are signaling system, power supply and distribution and track and construction work.

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Personal Items

F. A. Klock Controls Coach Operation

Fred A. Klock, formerly superintendent of motor coach operations of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has been appointed general manager of the North Shore Line's motor coach division. Reorganization of the motor coach department as a division attended the promotion. Simultaneously, Mr. Klock was also appointed general manager of the following associated motor coach companies under the management of Samuel Insull and associates: Metropolitan Motor Coach Company, Chicago-Milwaukee; Western Motor Coach Company, Chicago-Rockford, Ill.; Northwestern Transit Company, local service in Oak Park, Ill., and vicinity, and Northern Illinois Service Company, Chicago - Dixon, Ill. - Clinton, Iowa - Davenport, Iowa. Mr. Klock now has charge of the operation and maintenance of the entire group of motor coach companies. His office is located in the Commonwealth Edison Building, Chicago.

M. M. Herrell Traffic Agent at Logansport

The Indiana Service Corporation has announced the appointment of M. M. Herrell as traffic agent with headquarters at Logansport, Ind. Mr. Herrell will represent the traffic department in the freight and passenger business in Peru, Logansport, Delphi, Lafayette and intermediate points.

C. C. Gillette Resigns at Wheeling

C. C. Gillette, general manager of the Wheeling Public Service Company, Wheeling, W. Va., since June, 1926, has resigned. No announcement has been made on any new assignment Mr. Gillette will pursue. Rumor has it that his successor will be H. H. Patterson of Philadelphia.

During Mr. Gillette's two years administration in Wheeling many improvements have been made. New cars were put in operation during the period and considerable paving work accomplished or under way. As general manager in Wheeling he succeeded J. K. Buchanan.

Prior to his affiliation at Wheeling Mr. Gillette served as special investigator and then as traffic agent of the Pittsburgh Railways, Pittsburgh, Pa. On Oct. 1, 1925, he became research manager, succeeding A. C. Spurr. In the course of his five years with the Pittsburgh property he held a number of other executive positions, these embracing practically every phase of railway endeavor. The research department especially entered the entire field of electric transportation dealing with the quantity and quality of railway service and especially public relations.

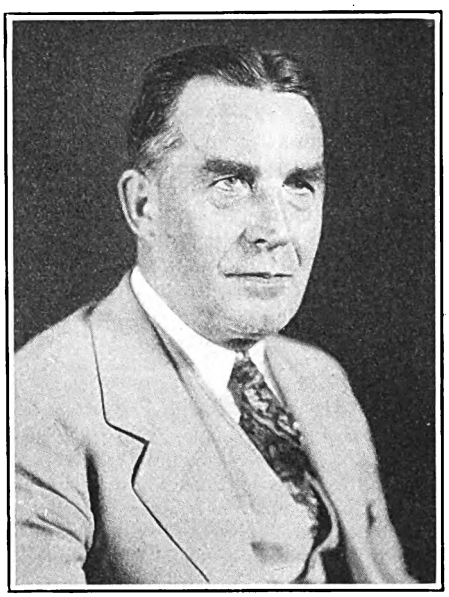
Mr. Gillette gained his first engineering experience with the American Expeditionary Forces in France. After he was graduated from Bucknell University with the degree of electrical engineer he joined the service and came out of the Meuse-Argonne offensive a captain. Immediately after the war he joined the engineering staff of the Westinghouse Electric & Manufacturing Company, engaging entirely in the railways project section. He was there two years and from there went to the Pittsburgh Railways.

Mr. Gillette was born in Rochester, N. Y., in 1895. He is a member of the American Legion and the Veterans of Foreign wars.

W. H. Sawyer Heads Stevens & Wood

Former East St. Louis executive and past-president of A.E.R.A. joins engineering firm as president with jurisdiction over its engineering, appraisal and report work

W. H. SAWYER has purchased a financial interest in Stevens & Wood, Inc., New York, and has joined that organization as president, succeeding in that position R. P. Stevens, who



W. H. Sawyer

as chairman of the board and executive committee will be enabled to concentrate on the financial and public utility phases of the business. He will assume his new duties in the near future and will devote his time principally to the business-engineering management of the Stevens & Wood organization and the properties they control.

It is a post of much magnitude that Mr. Sawyer is assuming. Stevens & Wood, Inc., are identified with the operation of public utilities in eight states, with a combined value of more than $150,000,000. These properties include the American Electric Power and the Penn-Ohio systems. The engineering and construction business of the firm now in progress includes work throughout most of the Eastern states and the territory of Alaska. A considerable part of this work, including, as it does appraisals and reports, is for outside interests with which Stevens & Wood have no financial connection. Particularly in this field is Mr. Sawyer's long service as an engineer, operator and executive of wide experience expected to add materially to the effectiveness of the Stevens & Wood organization.

As president of the American Electric Railway Association during the past year Mr. Sawyer has given unselfishly of his time toward promoting the interests and the development of the industry. He has traveled extensively, has visited many properties and has appeared on the program of various sectional associations in his effort to impress upon the industry a clear conception of the requirements for meeting present-day transportation demand. He is a firm believer in the possibilities of the bus in the development of public transportation service, but insists that destructive competition and exaggerated claims for the advantages of the bus handicap rather than further its development. He has been an ardent advocate of the need for improving the street car to meet present-day conditions, and devoted himself tirelessly to the task of insuring an adequate car exhibit at the recent convention in Cleveland.

After his graduation from the University of Nebraska the new president of Stevens & Wood, Inc., had a diversified and an important nine years experience with the General Electric Company. He then became engineer in charge of the New York office of Ford, Bacon & Davis, where he served for another nine years.

In 1914 Mr. Sawyer was elected vice-president of the E. W. Clark & Company Management Corporation, where he had further management, engineering and construction experience. This experience was further widened by his connection with the North American Company, as president of the East St. Louis & Suburban Railway and affiliated properties, which connection Mr. Sawyer leaves to join Stevens & Wood.

A great compliment was paid to his

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business and engineering ability when in 1925 Mr. Sawyer was retained by the Victorian Government of Australia and appointed a Royal Commissioner to inquire into and report upon the status and affairs of the Electricity Commission of Victoria, and especially as to its power generation and distribution. He obtained a leave of absence from the North American Company to undertake this work, which was accomplished with great success.

The business of Stevens & Wood, Inc., is increasing rapidly. Moreover, plans are underway by them for further expansion of their public utility interests, especially their consulting engineering, construction, appraisal and report business. This program has necessitated a material enlargement of their organization. The accession of Mr. Sawyer to the organization in connection with the corporation's expansion policy, bringing to bear as it will his keen mind, broad knowledge and experience, delightful personality and broad acquaintance in the public utility industry, should be of great value to that organization, particularly as he is a builder—a man careful in making decisions and fearless in carrying them out. He is an engineer-executive with a keen appreciation of the value of good public relations. He has an enviable record in his management of men. He knows the utility industry and he knows the public.

A. G. MacKenzie Directs Pennsylvania Committee

A. G. MacKenzie has been appointed director of the Pennsylvania Public Service Information Committee, according to an announcement made recently by P. H. Gadsden, vice-president of the United Gas Improvement Company, who is chairman of the committee. Mr. MacKenzie succeeds Major J. S. S. Richardson, who has become director of information for the Joint Committee of National Utility Associations.

Mr. MacKenzie has been associated with the Pennsylvania committee since October, 1925. He was formerly associated with Philadelphia newspapers in editorial and reportorial capacities. He has been acting director of the committee for the last five months.

H. W. Eales with Byllesby Engineering Corporation

H. W. Eales has been appointed head of the electrical engineering division, engineering department, of Byllesby Engineering & Management Corporation, New York. As a prominent engineer he accompanied W. H. Sawyer early in 1926 to Australia to assist in an investigation for the Victorian state government of the status and affairs of its State Electricity Commission.

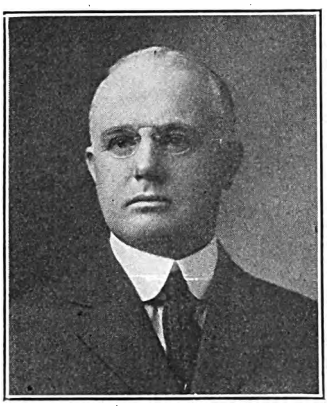
He entered the General Electric Company test course at the West Lynn works in 1907, and in 1909 was transferred to its St. Louis office. In 1913 he became chief electrical engineer of the Union Electric Light & Power Company, St. Louis. This position he held until joining the Byllesby Engineering & Management Corporation.

Mr. Eales was born in Coventry, England. He came to the United States at an early age and received his education in this country, graduating with honors from Yale University in 1904.

E. J. Dickson Leaves Providence

Edgar J. Dickson, vice-president of the United Electric Railways, Providence, R. I., has resigned because of ill health.

Mr. Dickson went to Providence to assume the duties of vice-president on July 1, 1923, severing connection with the International Railway, Buffalo, after a service record of ten years as vice-president in charge of operation. He went with the Buffalo property in 1913, and when the Mitten Management took



E. J. Dickson

control in 1920 he was one of the few officials connected with the former administration who remained with the property.

As mentioned in the ELECTRIC RAILWAY JOURNAL, issue of April 7, 1923, he served through the most trying period in the company's history, aggravated by a strike of the trainmen in July, 1922. He stuck to his post until the emergency had passed, an act which was greatly appreciated by the company and which was commented upon at the time of his resignation when the management accepted it with reluctance and regret. The management was not alone in expressing such sentiments on his leaving the city of Buffalo. In the public press of the territory in which the International Railway operates, his standing in the community and his notable services in the industry were fulsomely praised.

Mr. Dickson started in the transportation industry in 1887 with the Chicago, Burlington & Quincy Railway at Galesburg, Ill. Later he served with the Northern Pacific Railway at St. Paul, Minn., and still later with the Lehigh Valley Railway at South Bethlehem, Pa. Steadily advancing, he next became affiliated with the New England Investment & Security Company and then general manager of a group of four electric railways at Attleboro, Mass. Just prior to his connection with the International Railway he was general manager of the Springfield Street Railway, Springfield, Mass., one of the most important properties in the New England States.

Mr. Dickson was born at Joliet, Ill., in 1872.

As yet no successor has been named to Mr. Dickson. Temporarily, the transportation and traffic department of the United Electric Railways at Providence is being filled by Herbert B. Shaftoe, who is in charge of the financial and construction departments.

OBITUARY

H. R. Culley

Harry Randolph Culley, head of the freight department of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., died recently in Augusta. Mr. Culley went with the company in 1920, when Mr. Banghart was general manager. With him he brought a record of service in the transportation field, both in the navigation and steam railway fields. On account of his familiarity with the details of steam freight service, Mr. Banghart placed him in charge of that branch, which had been operating at a loss. To his efforts the revival of the freight business in that locality has been attributed.

Mr. Culley was born in Suffolk, Va., in 1859. He was educated in the public schools of that city and at the Boys Military Academy, Nansemond County, Va. His son, F. B. Culley, is general manager of the company at Augusta.

RALPH A. GILL former superintendent of railways for the Eastern Texas Electric Company, Beaumont, Tex., died recently at Holredge, Neb., where he was transferred about two years ago. He went to Beaumont from El Paso, where he was assistant to the superintendent of the El Paso Electric Company.

A. K. PLUMMER, long affiliated with the Los Angeles Railway, Los Angeles, Cal., died recently. He entered the service as a motorman on Aug. 27, 1903, and continued in that capacity until Nov. 1, 1906, when he was appointed extra inspector and regular inspector a year or two later. He was transferred to the instruction department on Sept. 8, 1917. A few years later he was appointed director of traffic. When failing health compelled his transfer to less arduous duties on Oct. 1, 1923, he was placed in charge of the signing up and dispatching of cars from the various divisions and succeeded in improving conditions materially.

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Manufactures *and the* Markets

Work on Twelve Macon Cars Progresses

The twelve new cars being built by the Perley A. Thomas Car Company for the Macon Light & Railway Company are scheduled for delivery in November. The cars, which are of the one-man, double-end, double-truck type, have an over-all length of 41 ft. 8 in. and a seating capacity of 40. The exterior color scheme is of green and cream, while the interior trim is of cherry.

Specifications covering the cars are appended here:

Number of units	12
Type of unit	One-man, motor, passenger, city, double end, double truck
Number of seats	40
Builder of car body	Perley A. Thomas Car Co., High Point, N. C.
Date of order	June, 1927
Date of delivery	November
Length over all	41 ft. 8 in.
Length over body posts	28 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4½ in.
Height, rail to trolley base	11 ft. 3 in.
Window post spacing	29½ in.
Body	All steel
Roof	Arch
Doors	End
Air brakes	Safety Car Devices
Armature bearings	Plain
Axles	A.E.R.A. E-2 Phys.prop. E-5-24
Car signal system	Faraday
Compressors	Westinghouse DH-16
Conduit	Flexible
Control	K-35-KK
Curtain fixtures	Curtain Supply Co., Rex roller No. 90 fixtures
Curtain material	Pantasote, double grain color 86
Destination signs	Keystone ILR and RLR
Door mechanism	National 1 neumatic or Consolidated
Doors	Sliding
Floor covering	Rubber tile
Gears and pinions	G.E., long and short addendum
Glass	Plate and D.S.A.
Hand brakes	Peacock staffless
Hand straps	Rico retrieving
Heaters	C.C.H. Co. with G.E. helicoil elements
Headlights	G.E. J-34
Headlining	⅛ Haskelite
Interior trim	Natural cherry
Journal bearings	Plain
Journal boxes	Taylor
Lamp fixtures	Keystone center dome
Motors	Four G.E.-264, inside hung
Painting scheme	Green and cream
Registers	Ohmer
Roof material	⅛-in. poplar
Safety car devices	Standard
Sash fixtures	Curtain Supply Co., brass sash
Seats	Hale & Kilburn AWO 400 walkover
Seat spacing	29½-in.
Seating material	Canvas lined cane inerts
Slack adjusters	American, Form E-1
Steps	Stationary
Step treads	Kass
Trolley catchers	Ohio Brass No. 13141
Trolley base	Ohio Brass Form 4, Timken bearing
Trolley wheels	Nuttall 4-in.
Trucks	Taylor, type M
Ventilators	Nichols-Lintern, type C
Wheels	26-in. cast chilled
Wheelguards	HB type
Special devices	Treadle doors with power and brake interlock and signal lights

Ten Units Ordered for Milwaukee

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has ordered ten one-man cars at a cost of $14,000 each. Delivery is expected from the St. Louis Car Company, builders, on Dec. 1 this year. Except for several minor improvements, the new units will be identical with the 50 new one-man safety cars purchased last winter. The contemplated changes include improved design of the movable platform seats, further improvement in location of compressed air pipes and probably the installation of a permanent operator's seat on each platform.

Patent is a Monopoly, Says Report of N.E.M.A. Committee

Although asking for more time in which to continue further study, the committee on cross-licensing of patents, National Electric Manufacturers' Association, has agreed on the following principles which were presented to the policies division of the association at its meeting during the first week of September:

A patent is a monopoly granted to an inventor or his assignee for a term of seventeen years. It is designed and intended to be a monopoly, the important objects of which are to stimulate the making of inventions and to justify the expenditure of money in the development and working out of inventions after they are made.

Any policy of cross-licensing must, in our opinion, be based upon the fundamental consideration that a patent is, and fundamentally should be, a monopoly, and that the holder of any lawful monopoly is entitled to decide for himself the manner in which he will use it.

Any licensing plan must, therefore, be acceptable not only to those parties who have no patents (or no important patents), but also to whatever parties may happen to have patents regarded by them as important.

We all recognize that in the case of an individual grant of a license under a patent, if the royalty is too high the return from the royalty will be likely to be small, whereas, on the other hand, if the royalty is too low the return will necessarily be unduly small.

Your committee also recognizes that it is often undesirable and unwise to grant too many licenses under any particular patent or group of patents, since it often happens that it is only by limiting the number of licensees that it is possible to obtain sufficient interest on the part of a group of manufacturers properly organized and equipped to undertake the manufacturing and distribution of the patented device. Such restriction of the number of licensees often aids, both directly or indirectly, in maintaining the quality of the article and the service to the public.

Your committee believes it advisable also to make it clear that no cross-licensing arrangement involving all the patents of the electrical industry has been, or should be, considered practicable. The extreme diversity of the electrical industry makes it fall naturally in certain groups. In some of these groups the bulk of the valuable patents is held by a relatively small number of concerns. In other groups the distribution of valuable patents is more general. There are a number of group licensing arrangements in force at the present time, in different branches of the industry, and most of these seem to work very well. There is no justification whatever for disturbing such arrangements; there is, on the other hand, every reason why they should be studied with a view to determining whether similar arrangements, duly modified to take care of the exigencies encountered, might not be useful in other branches of the industry.

Considering this whole question, it should be remembered that the cost of patent litigation is often high, so high that there are unquestionably a number of valuable patents in the industry which are not being enforced because of fear on the part of the owners of being involved in unduly high legal expense. On the other hand, it will doubtless be found that certain manufacturers are handicapped in their enterprises by their fear of these patents, or by their unwillingness to infringe them, even though they are not being aggressively enforced.

Your committee is satisfied that no general formula can be devised; that each case must be studied on its merits.

New Orleans Cars to Be Delivered in November

Details for the twenty new cars ordered by the New Orleans Public Service, Inc., on Aug. 22, 1927, have been released. The cars are being built by the St. Louis Car Company and the Perley A. Thomas Car Company and will be delivered near the end of November. They are all-steel, double-truck, double-end cars designed for one-man or two man operation. The seating capacity is 52 and the total weight 40,000 lb. Previous mention of the order appeared in the JOURNAL of Aug. 20.

The specifications as given by the New Orleans Public Service are as shown below:

Number of cars	20
Date order was placed	Aug. 22, 1927
Date of delivery	90 days
Builder of car body	Ten, St. Louis Car Company; ten, Perley A. Thomas Car Company
Type of car	Double-truck, double-end, one-man, two-man safety car
Seating capacity	52
Weight	Total, 40,000 lb.
Length over bumpers	48 ft. 2 in.
Length of body	34 ft. 2 in.
Width over all	8 ft. 7 in.
Height, rail to trolley base	11 ft. 1¼ in.
Body, type	Steel, arched roof
Interior trim	Cherry
Roof	Poplar and No. 8 duck
Air brakes	Westinghouse air brake and General Electric
Axles	Standard Forging Company
Bumpers	Hedley anti-climber
Buzzers	Faraday
Car trimmings	Bronze
Conduits and junction boxes	Steel
Control	K-35-JJ
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Keystone
Door-operating mechanism	National Pneumatic
Gears and pinions	General Electric and Westinghouse
Hand brakes	Peacock staffless
Headlights	Ohio Brass, type ZP
Headlining	Agasote
Journal boxes	Brill M.C.B.
Lightning arresters	Aluminum cell
Motors	Four G.E. 265-G and Westinghouse 510-E
Paint	Murphy Varnish Co.
Registers	International R-11
Sanders	Nichols-Lintern
Sash fixtures	Curtain Supply Co., brass sash
Seats	Hale & Kilburn
Seating material	Wood slat
Side and center bearings	Brill
Slack adjusters	American Brake Co., type "X"
Springs	Brill
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass No. 11398
Trucks	Brill 76-E-1
Ventilators	Railways Utilities Co.
Wheels	Southern Car Wheel Co.
Wheel Guards	H-B life guard Consolidated Car Fender Company
Miscellaneous	Ellcon 1-in. white enamel stanchions

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Trial Trolley Buses for Penang Completed

Last year the municipality of Georgetown, Penang, Malaya, decided to start trackless trolley service and an order was placed in England for three vehicles for trial. These vehicles have now been completed and are about to be shipped.

Apart from the fact that they have the driving motor in an extreme forward position in order to obtain the lowest possible loading line, the chassis is in all respects built on the same principles as the improved type of trolley bus fitted with pneumatic tires, concerning which an article was published in this paper.

The body is of a type suitable for the use of natives and is provided with wooden slatted seats in place of upholstered seats. The whole of the framework is of teak instead of European woods. The body has a seating capacity of 35. The windows are made to drop and are fitted with sun blinds. The entrance is at the rear, with a low loading platform. Doors are provided on both sides of the driver's compartment, one being for the use of the driver and the other for staff use.

Ten One-Man, Two-Man Cars for North Shore & Milwaukee

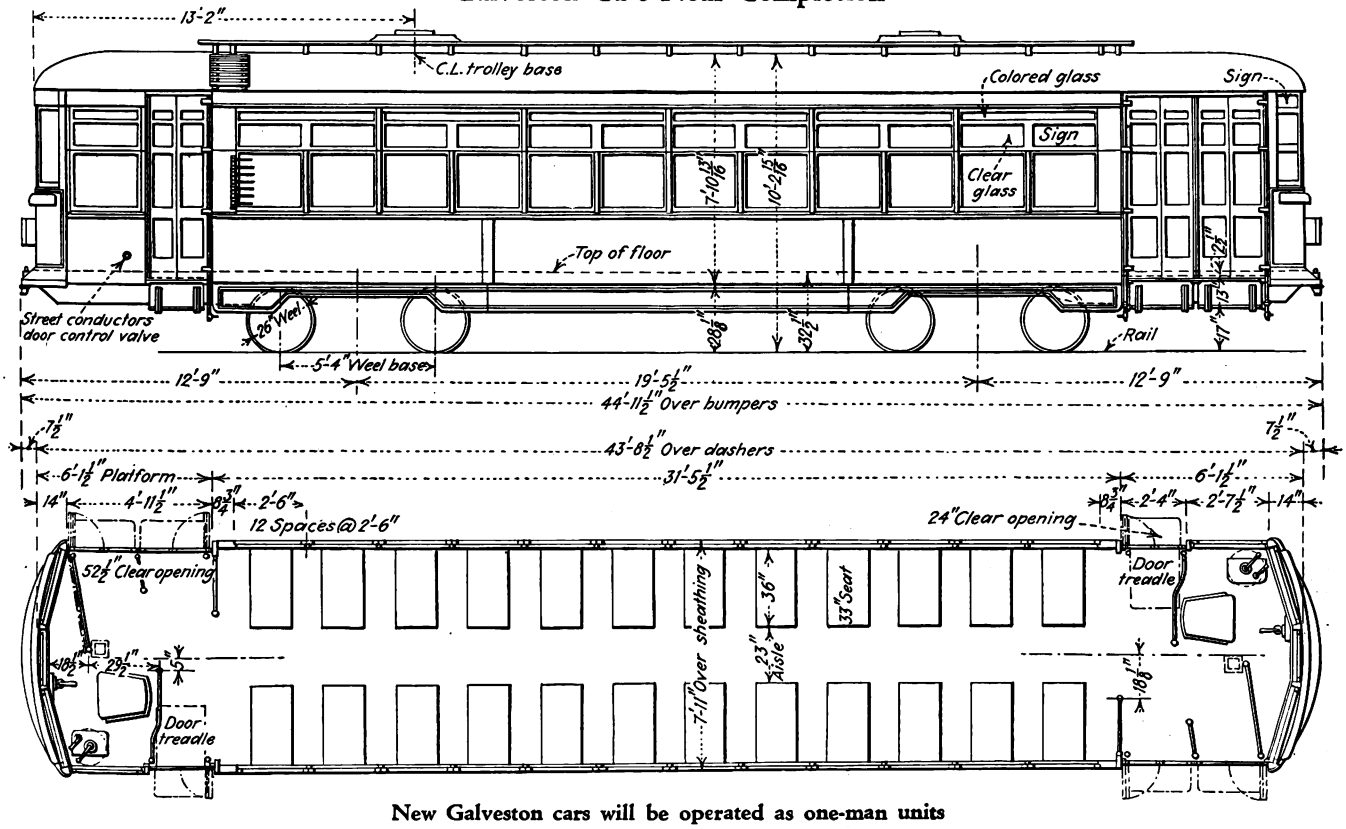
Ten new double-truck, one-man, two-man city type cars of modern design have been ordered by the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., from the St. Louis Car Company. The units will be 50 ft. long and they will be equipped throughout with the latest safety controls and devices. They will replace the present single-truck, one-man, safety units now in service on the Milwaukee city division of the road. A color scheme of orange and maroon has been specified for the exterior.

Metal Markets Mark Time

Developments in the non-ferrous metal markets during the week ended Oct. 11 have been unimportant. Zinc prices are a little higher and tin is a little easier. Lead and copper are virtually unchanged. Copper and zinc have been very quiet, this being attributable in the case of zinc to a very active week just preceding. As for copper, this is the third successive dull week. Lead has been bought in good volume and consumers likewise have been in the tin market for fair amounts of metal.

Copper buying in large volume that producers have been expecting to develop has not begun yet, the past week being the smallest in point of tonnage sold for two months at least. Only two sellers did business under 13.25 cents delivered in Connecticut, but the tonnage at lower figures exceeded that at the even quarter by a good margin. On Oct. 6 several good sales were made at

Galveston Cars Near Completion



New Galveston cars will be operated as one-man units

Galveston Electric Company, Galveston, Tex., is expecting delivery in the near future of four double-end, double-truck cars from the American Car Company, St. Louis, Mo. The order was placed on Feb. 24, as noted in a recent issue of the ELECTRIC RAILWAY JOURNAL.

The cars, which will be of semi-steel construction, will have a length over all of 44 ft. 11½ in. and will have 24 double seats upholstered in genuine hand-buffed leather. General Electric No. 510-A motors have been specified.

The principal specifications of the new units are appended here:

Number of cars ordered	4
Builder of car body	American Car Company, St. Louis, Mo.
Bolster centers	19 ft. 5½ in.
Length over all	44 ft. 11½ in.
Length over body posts	31 ft. 5½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 2 in.
Height, rail to trolley base	132 in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse
Axles	A.E.R.A.
Car signal system	Faraday
Compressors	DH-16
Control	K-75
Couplers	American Car Company
Curtain fixtures	National Lock Washer Company
Curtain material	Double-faced Pantasote
Destination signs	Hunter
Door mechanism	American Car Company
Doors	Folding
Fare boxes	Johnson DM-3
Floor covering	Rubber tiling
Headlights	Golden Glow SM-95
Headlining	Haskelite
Interior trim	Mahogany, bronze nickel-plated
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Dome type
Motors	Four General Electric 510A, inside hung
Roof material	Canvas
Sash fixtures	Schechter post casing
Seats	Brill 201-D
Seat spacing	30-in.
Seating material	Genuine hand-buffed leather
Slack adjusters	Westinghouse type E
Steps	Folding
Step treads	Feralun
Trolley catchers	Keystone
Trolley base	Ohio Brass Company
Trolley wheels	Holland
Trucks	Brill 177-E-1-X
Wheels	26-in. Davis cast steel
Wheelguards	HB, six-bar type
Special devices	Economy meters

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13.125 cents, but 13.15 and 13.175 cents was the ruling figure Oct. 11. At the same time sales have been made each day during the week at 13.25 cents, particularly on the last few days. Business in Europe has been quite satisfactory at the exporter's price of 13.50.

The buying of zinc that materialized in such large volume when the price sagged to 6 cents last week subsided as prices were advanced. Nevertheless a fair business was done and prices seemed firm at 6.075 cents Oct. 12, with still more being realized on occasional lots. Joplin concentrate sales were up last week, but production continues well above 15,000 tons per week. The principal buyers of slab zinc during the week have been brass melters, the galvanizers apparently having supplied themselves for the time being.

Most sellers sold satisfactory tonnages of lead during the last week, that metal being in considerably better demand than copper. Prices were unchanged, practically all sales being made on the basis of 6 cents St. Louis or 6.25 cents New York, the last named quotation also continuing as the contract price of the American Smelting & Refining Company. Desilverized lead in the Middle West, however, has sold nearer to a 6.05 cents St. Louis basis. Though the London price on prompt lead in London declined to a new low of £20 1s. 3d. Oct. 7, the market since then has turned stronger, so that Oct. 12 price was somewhat above that of Oct. 5.

Corroders continue to take good tonnages of lead, and a fair amount has been sold to ammunition makers in the last week.

The tin market was largely a routine affair until Oct. 11, when lower prices in London brought offerings here as low as 57.75 cents for prompt Straits tin. Consumers then entered the market and quickly pushed the price up to 58 cents, at which level an appreciable tonnage was sold. Tin for shipment from the Straits has averaged about a half-cent less than prompt, and 99 per cent has been available for from ¾ to 1 cent below the Straits quotation.

Soft Seats Popular in London

So popular has been the introduction of spring cushioned seats in the lower decks of the London tramway cars that the County Council has now decided to provide similar seats on the upper decks. The cost is estimated at £37 per car.

SHOPS AND BUILDINGS

BOSTON ELEVATED RAILWAY, Boston, Mass., is making some changes at the Everett terminal station, where it is enlarging platforms and building new tracks. The purpose is to provide for more traffic, give station accommodations to local passengers so that they can take cars inside the station, and also to provide storage space for cars which now have to lay over at Malden Square. This will relieve Malden Square of congestion and afford a better schedule out of the Everett terminal station.

INTERNATIONAL BUS CORPORATION, a subsidiary of the International Railway Buffalo, N. Y., announces plans for the construction of a 91-ft. x 150-ft. steel and brick addition to its bus garage at Walden Avenue and Lathrop Street.

TRADE NOTES

CUTLER-HAMMER MANUFACTURING COMPANY, Milwaukee, Wis., announces the removal of its Cleveland office from the Guardian Trust Building to the Guaranty Title Building.

LARS G. NILSON has resigned as chief engineer of the Nilson-Miller Corporation, Hoboken, N. J., to enter consulting engineering practice. Mr. Nilson has been connected with the Nilson-Miller firm for eighteen years. He will continue to serve the corporation as consultant.

KEYSTONE CARBON COMPANY, Emporium, Pa., has placed on the market what it considers an entirely new material for metal and semi-metal brush application. Factors taken into consideration in the manufacture and development of this new material were increase in friction-resisting properties and very low electrical resistance.

TRICO FUSE MANUFACTURING COMPANY, Milwaukee, Wis., announces an improvement in its ferrule type renewable fuses. The improvement is said to reduce the time spent in renewing fuses and eliminates all small loose parts. This is accomplished by a method of using spring retainers on the end caps to hold the end screws. There are now only two parts and the renewal element. The general design of the fuse requires the removal of only one cap when renewing. This improvement has been made in additon to the recent one on the knife-blade type fuse. Samples and literature are available by writing the manufacturer.

ELECTRIC RAILWAY MATERIAL PRICES—OCT. 11, 1927

Metals—New York

Copper, electrolytic, cents per lb	13.0
Lead, cents per lb	6.25
Nickel, cents per lb	35.00
Zinc, cents per lb	6.075
Tin, Straits, cents per lb	58.0
Aluminum, 98 or 99 per cent, cents per lb	26.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.175
Somerset mine run, Boston	1.80
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	1.775
Central, Ill., screenings, Chicago	1.625
Kansas screenings, Kansas City	2.675

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.85
Tie plates (flat type), cents per lb	2.25
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	2.15
Ties, white oak, Chicago, 6 in.x8 in.x8 ft	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb	3.00
Sheet iron, galvanized (24 gage), cents per lb.	3.85
Galvanized barbed wire, cents per lb	3.25
Galvanized wire, ordinary, cents per lb	2.40

Waste—New York

Waste, wool, cents per lb	14–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	14–19.50
Colored	9-16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.5
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal	$0.56
Putty, 100 lb. tins, cents per lb	5.25–5.50

Wire—New York

Copper wire, cents per lb	15.25
Rubber-covered wire, No. 14, per 1,000 ft.	5.50
Weatherproof wire base, cents per lb	15.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.85
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y	1.75
Sand, cu.yd., f.o.b. N. Y	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb	10.50
Light copper, cents per lb	9.25
Heavy yellow brass, cents per lb	7.00
Zinc, old scrap, cents per lb	3.875
Lead, cents per lb. (heavy)	5.25
Steel car axles, Chicago, net ton	$17.00
Cast iron car wheels, Chicago, gross ton	13 75
Rails (short), Chicago, gross ton	15.25
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.25

ADVERTISING LITERATURE

J. G. BRILL COMPANY, Philadelphia, Pa., is issuing loose-leaf fillers for its seat catalog No. 284, which deals with car and bus seats. The sheets under review feature the Brill No. 202-B-1 car type seat, with dimensions; a diagram of the Brill No. 301 and 130 car and bus type seat, with standard dimensions, and the Brill No. 201-D car type seat with dimensions and diagram.

IRVING IRON WORKS COMPANY, Long Island City, is mailing an illustrated postcard describing Irving "subway" flooring.

BEARDSLEY & PIPER COMPANY, manufacturer of sand conditioning and conveying equipment and "Sandslingers," has mailed 4,500 copies of its house organ, *Better Methods*, to the trade by air mail. This is the first publication of any kind, so far as is known, that has used air mail as a means of distributing a complete issue. The stunt was a tribute to Col. Charles Lindbergh.

TIMKEN-DETROIT AXLE COMPANY, Detroit, Mich., has issued a folder entitled "The Theory of the Differential and How It Is Applied to Timken Axle-Worm Drive."

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, October 22, 1927 *Number 17*

Occasion for Justifiable Pride

SOME of the practices and the results accomplished by the track and electrical departments of the Chicago Surface Lines, as presented by that company in its brief for the 1927 Coffin Award, are outlined in an article in this issue. Other phases of the property's accomplishments will be published in subsequent issues. These records speak for themselves. But in interpreting the performance of this largest street railway in the world several pertinent factors should be borne in mind.

First of all, labor rates in Chicago are as high as in any city in the country. That condition is not peculiar to transportation labor, but is attributable, at least in large part, to the generally high level of rates paid by various industries in the city. Consequently, the management was faced not with a theory but with a condition over which it had little control; that is, it had little opportunity for initiative in determining the prevailing level of labor rates. It did, however, have control over the facilities which directly affect the productivity of labor. The cost per man-hour was fixed by conditions in the community, but the number of man-hours per job was partly in the hands of the management.

So it is to the record of unit costs that we must look for a measure of efficiency. There will be found figures that show up very favorably with comparable properties in other cities. Not only is this important fact made clear in the company's presentation, but the reason is quickly evident. In Chicago machines are cheaper than men, and so on every hand is found the substitution of machine for hand labor.

There is a deeper significance in all this. Even nominal foresight on the part of the management would dictate adoption of machinery by an enterprise whose future was clearly mapped. Such, however, was not the situation of the Chicago Surface Lines. The franchises expired in February, 1927. Since that date the property has been operated under temporary grants, and one of the constituent companies is in technical receivership.

Not only in the figures themselves, but in the conditions under which they were recorded, lies the true measure of Chicago's accomplishments. Machinery calls for capital and to get capital requires credit. It is one thing to put money into an enterprise which is promising, but it requires an entirely different quality of foresight and courage when no bridge is visible over troubled waters.

Chicago turned hard cash into more cars, new and rebuilt track, more efficient substations and maintenance machinery to keep these facilities at the highest possible standard of efficiency, despite costly labor and an uncertain future. In no city of the country has there ever been a like demonstration, on such a scale, of faith in the fundamental need for street railway transportation, in the ultimate judgment of the American people toward a transportation management or in the power of demonstrated efficiency to win a square deal for invested capital. In most cities the approach of such a franchise condition as now exists in Chicago has been accompanied by physical deterioration and operating lassitude.

There is strong evidence that the full significance of the Surface Lines management's performance during the past several years is gradually penetrating the public consciousness in that city. When an equitable franchise settlement is reached—such a result seems inevitable if the present policy is continued—there will have been written what is perhaps the most glorious chapter in all recent local transportation history.

What the Maintenance Contest Teaches

GOING over the many items submitted in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest one is impressed particularly by the large variety of problems with which electric railway maintenance departments are confronted. The articles show an earnest desire on the part of the men who submitted them to lower maintenance costs, to provide more efficient and better methods, to eliminate fatiguing operations and manual labor, to overcome troubles experienced in the various operations and to provide improved equipment to do the work.

Sometimes shop-constructed equipment is employed which might be considered crude, but time and labor are saved by using it and the need for improved equipment of this character is demonstrated. There are two reasons why this equipment is built in electric railway shops. First, few devices such as are needed for these special operations are available ready built by the manufacturers. Secondly, the railway has the material and labor necessary for making these, and managers frown on authorizing necessary appropriations for new and untried equipment while the shop forces can build such devices as will satisfy them and charge the cost to maintenance.

Frequently, after apparatus designed and built in the shop to serve a specific purpose has been given a tryout and changes that experience shows are necessary have been made, the improved device may be put on the market in commercial form by a manufacturer.

Another lesson learned from a study of the material submitted in this contest is that there is particular need for the interchange of ideas among maintenance men and the adoption on each property of the more progressive methods and equipment that are found of value on other railways. There seems to be a hesitancy on the part of some to use a method because it originated elsewhere, or, on the other hand, to broadcast their own methods that have been found of particular value. Much good will result from a free interchange of ideas.

This is the issue in October that is devoted essentially to maintenance and construction subjects

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Good Cars Deserve Good Track

WITH the trend toward better accomplishment in railroad operation one item is receiving too little consideration—the track. Strenuous effort is being made to improve public relations through the use of better appearing and riding cars and other means of sales appeal. But, alas, the track is down in the dirt and in a fair way to be overlooked or given scant attention. It requires no detailed analysis or proof to show that this is short-sighted, and particularly so for the interurban railway. A rough track shakes a good car to pieces and even a good car makes the bad track still worse.

Aside from the mechanics of the problem, which determines cost, rough track drives away the passenger. Instances can be cited without number to prove this, but the following is typical. An executive of a large city system has occasion to use an interurban road to another large city and the necessary pass to permit his free use of the electric line. This system is well equipped with the most modern of cars, which would furnish a most enjoyable ride were it not for a rough track. This executive, rather than submit to the rough-riding track, takes the steam train and pays his fare. If the electric railways cannot sell their wares to members of their own fraternity, how can they hope to stimulate public patronage? There is nothing more terrifying than a high-speed interurban car lurching from side to side.

An Engineering Accomplishment in Tongue Switch Design

EMPHATIC approval of the recommended design for a standard solid manganese steel tongue switch registered by way engineers at the round-table luncheon held in Cleveland during the convention serves particularly well to illustrate the successful working of the new method of conducting Engineering Association studies through special committees, which was commented on in an editorial last week.

To those versed in Engineering Association affairs a near-miracle has come to pass. Five years ago no way engineer would have ventured to hope that such a standard could be adopted, but the special committee, in securing agreement among both manufacturers and users on the details of such an important piece of track mechanism, has accomplished just that object after only three years.

It is doubtful if a large committee constituted as the way committee was formerly, with nearly 30 members, could have done this in so short a time, and the immediate approval of the new design gives good evidence of the value of the special committee method for the study of highly specialized subjects and emphasizes the merit of the important change in conduct of Engineering Association committee work begun during the year 1925-26.

What a standard tongue switch design means to the industry is readily apparent to executives as well as engineers, and the display at the convention of an actual switch made to the new design was a stroke of good business. Every one could see what was being talked about. The luncheon discussion of the switch was another piece of good management. It seemed to interest the engineers who should use the switch in the need for actual purchase and use under traffic tests which are necessary to develop the value of the several novel features found in the new design.

The special committee responsible for the design deserves great credit for its work. It remains for executives and way engineers generally to do their part in making test installations, thus assisting the committee and showing appreciation of its efforts to aid in securing further economy in operation which should result from this important piece of standardization work.

Time Saving Important Factor in Reducing Maintenance Costs

LONG hours of labor were the rule in repair shops of yesterday, the wages paid workmen were small and raw material was low in price. These economic factors permitted the use of cut-and-try methods of repair, which did not serve to awaken the human consciousness to the great importance and value of time.

Much old equipment is still in use today. Work done by it may be quite well finished, but when checked with the economical production resulting from use of up-to-date equipment, the time taken is astonishing. In these prehistoric shops it is quite usual to find an obsolete motor running the entire system of shafting. If it is necessary to drill only a $\frac{1}{4}$-in. hole, the whole plant must be set in motion so that the drill press may run. Compare this arrangement with some of the modern shops, where each tool is driven individually and where no energy is wasted to drive machines not in actual use.

Time saving of today does not include alone machine tool design or methods of installation and drive. In modern shops much is being done to promote the required efficiency through the use of special appliances, jigs and fixtures. The parts when completed or repaired with the assistance of these devices have longer life because of greater accuracy and precision in manufacture. Such fixtures also make possible interchangeability of machined parts, with resultant saving in installation.

Jigs and special fixtures frequently reduce the time and energy required for repairing car parts by more than 75 per cent of that used but a short period ago. The use of this improved equipment has made possible the carrying out of many repairs to parts where previously they were replaced by new ones. The worn parts were scrapped indiscriminately, and the new ones were put in without particular thought of the cost of the material or the wastefulness of such a procedure. Now many railways have reclamation departments, so that the parts removed are sent to these and they are so reconditioned as to again be able to serve as well as the new parts.

The effect of the maintenance department's performance on reliability of service and upon the condition in which the passenger finds equipment is most marked. The very life of electric railway service depends on its reliability. Interruptions of service due to failures of equipment, track or line are a serious detriment to the reputation of any company and to any railway organization. It takes but few such interruptions to put the company in a bad light in the eyes of the public and its patrons. In addition, maintenance forces play an important part in fixing the expenses of operation. In proportion as the performance of maintenance forces increases or decreases, operating expenses increase and decrease, and these have a marked effect on the margin of resources that the management has available for the improvement of service to the public. Officials must give increased attention to maintenance methods. One of the least expensive improvements that can be made is to provide special tools and fixtures for doing the work so that it can be carried out more efficiently and so that the parts, when repaired, will be of the highest type.

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Absentees from Formal Discussion Detract from Value of Meetings

EFFORTS made by the program committees of the various associations to arrange well-balanced meetings are defeated if men who promise to participate in the discussion fail to appear. This year a special endeavor was made to liven up the proceedings by reducing to a minimum the time spent reading formal reports. It was thought that this time could be spent more profitably in numerous short discussions in which transportation men from all over the country could give their views.

That this plan is a good one was clearly shown by the lively interest evinced by the delegates in the discussion. But there was not enough of it. The chairmen called on man after man listed on the program without response. Of 40 men scheduled to discuss various topics at the sessions of one of the affiliated associations only fifteen appeared. Eight were represented by substitutes and seventeen failed to participate in any way. From this sorry showing it is evident that those who have promised to discuss committee reports need to be aroused to a keener appreciation of their responsibilities. It might be well for next year's program committees to make note of this while the recollection of it is fresh, in order that it shall not be repeated at the 1928 convention.

Putting Line Maintenance on a Business Basis

DISCUSSION of trolley wire failures has been avoided in some quarters, like a plague or a hidden sin, although the resulting delay is very evident and can only give the public a more unfavorable impression of street car service. Each break is spectacular to a degree, and stands out to patrons of the road like an advertisement of non-reliability. From an economic standpoint, each break is extremely costly in car delay, loss of revenue and accident contingency.

However, despite the lack of publicity, overhead maintenance on many properties has advanced to such a point that the familiar cry of "trolley down" and the thrilling dash of the emergency crew to the scene is now a rare occurrence. On these roads preventable wire breaks do not exist, because the wire is repaired before the breaking point is reached.

To the mind of the operator of each road, the overhead plant resolves itself into the contact wire alone. Some managements judge efficiency of the line department only by the rapidity with which breaks can be repaired. Little or no cognizance is taken by them of the number of failures, their causes and the car mileage operated. A better way of judging efficiency in respect to trolley wire breaks should be by the number of preventable breaks in direct ratio to the number of car-miles traveled. Certain data make it seem that this figure should be in the neighborhood of one failure for every 1,000,000 car-miles traveled. With this figure or the A.E.R.E.A. suggested average of 0.5 break per single-track mile as a basis of comparison operators can readily compare the efficiency of their overhead plant.

Many properties are now establishing records for uninterrupted service which were thought impossible a few years ago. These roads have lowered their trolley breaks to such a point that practically all that occur are due to agencies beyond the control of the overhead department. It is suprising to note that these results are being obtained at less total cost than with the "rush out and pick up" method.

What is possible on these properties is possible on all. The speed of the emergency crew must surrender to the accuracy of frequent inspection and adequate renewals, and thus lay the bogey of the trolley down to rest with the other "it can't be done's."

Raising Safety to a Major Factor in Industry

HIGH production and most efficient operation can be secured only through the elimination of accidents and their resulting costs, says a committee of the American Engineering Council, which for more than a year has been making an exhaustive study of nation-wide safety and production. As the result of representation by the National Bureau of Casualty and Surety Underwriters, by which it was financed, a study was made of twenty industries and 60 productive groups, based upon an experience of over 50,000,000,000 man-hours. Thirty-six local committees comprising 230 engineers in all parts of the country participated. Out of their investigation came the undeniable slogan, "The safe factory is the efficient factory, and the efficient factory is the safe factory."

The report contains thirteen detailed findings built up from data covering 13,898 companies, 122,028 company-years, 2,454,413 employees, 13,143,569 man-years, and 54,430,707,000 man-hours.

From these data there have been deduced several axioms, among them: (1) Maximum productivity is dependent on the reduction of accidents to an irreducible minimum; (2) there is such a close relationship between safety and production that it is impossible for a plant to have continued increase in productivity unless at the same time it reduces its accident rate; (3) individual companies report that material reduction in accident rates can be obtained simultaneously with increase in production rates; (4) the rate of production per man-hour for the industrial groups studied was 13.4 per cent higher in 1925 than in 1922; (5) prior to this the rate of accident frequency per man-hour was 10.4 per cent lower in 1925 than in 1922; (6) accident prevention and performance in the past in each industry shows tremendous improvement, and similar results can be achieved by the remaining plants in each industry. Also, a great many do not analyze or even keep proper records.

Perhaps the most significant statement in the entire report is as follows: "The dynamic force which can obtain this highly desired objective has but one source: it resides in the management. Therefore, a responsibility that cannot be evaded rests on the managers and executives of industry to make safety a major interest and a controlling care. Here is the crux of the entire safety movement and one that has been lost sight of due to faulty methods of applying the safety program. The JOURNAL has stressed this point and would stress it again: No employee is going to respect the safety program when he is conscious that his employer does not. Safety cannot be assimilated in piecemeal. It must be a steady and consistent diet strictly adhered to by everyone, from the president to the office boy.

In fixing the responsibility for higher production and more efficient operation the American Engineering Council committee has called a spade a spade, something which should have been done in the safety field of engineering industries long ago. By its recommendations and its findings this committee has raised safety to a major factor in American industry.

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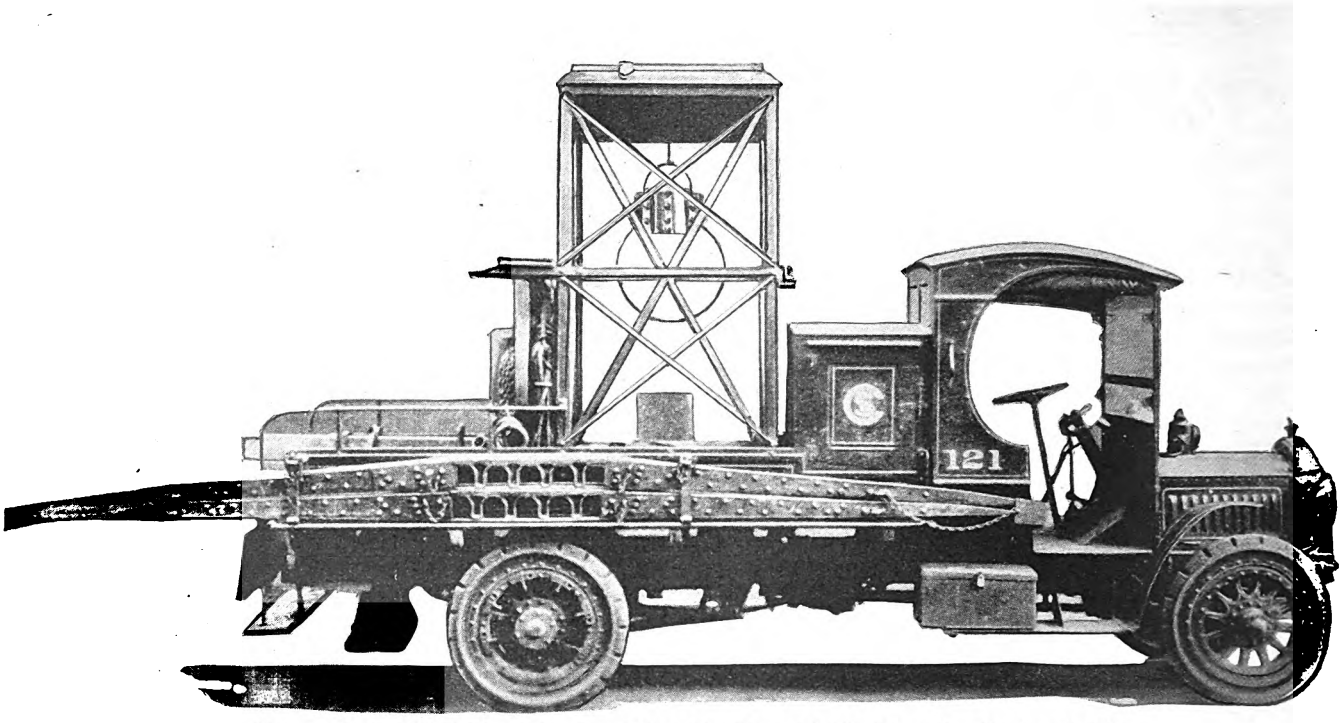

Wrecking truck used by Chicago Surface Lines, showing method of carrying fire hose bridges. These trucks are of 3 to 3½ tons capacity

Track and Power Efficiency

Increased in Chicago

Chicago Surface Lines reveals in its brief filed in the Charles A. Coffin contest some of the methods and practices that have enabled the track and electrical departments of the company to hold down costs in the face of high labor and material prices

BOTH the track and electrical departments of the Chicago Surface Lines have been called upon to show a constantly increasing efficiency in order to meet that company's program of improved service and reduced costs while at the same time paying the highest wages, both for skilled and unskilled labor, of any property in the industry. The record of how this result has been accomplished, as revealed in the company's brief filed in the 1927 Coffin Award contest, is one of systematically reducing expensive hand labor to a minimum. At the same time, the company's policy of increasing and improving service in the face of expiring franchises that prevented the acquirement of new capital has taxed the ingenuity of both track and electrical forces to keep up with the constant demand for greater utilization of existing facilities.

The substitution of machine for hand labor has played an important part in increasing the efficiency of the track forces of the Chicago Surface Lines. Equipment of this department includes two sizes of air compressors, the larger unit with a capacity of 360 cu.ft. operating four concrete breakers or eight tie tampers, and the smaller machine capable of operating four tie tampers or two concrete breakers. Drake continuous mixers and those of the Chicago type, both mounted on trucks, are used for large concrete jobs. For smaller projects mixer-mobiles propelled by the engine of a 1-ton truck are used. Concrete materials are handled by bucket loaders. Rotary grinders of the Atlas type, rated at 7 hp., take care of electric seam-welded joints and electric welds on special trackwork, both manganese and high carbon. Vulcan type reciprocating grinders are used for thermit welds, and electric hand grinders for the throat ways of manganese mates and frogs where one run is used more than another. The hand grinders are particularly valuable for use on emergency curves in the downtown district. Rail corrugations are removed with six Kerwin grinder cars. For straight trackwork, electric boring and spike-driving machines are employed. Duntley track drills are used for tie-rod and fish-plate holes.

For maintenance work, an asphalt road repair outfit has been found to be of great assistance, not only for the specific duty for which it is designed but for heating concrete materials during winter work. The company also has a number of Differential dump cars and flat cars, the latter equipped for unloading ballast with air-operated sliding trapdoors.

Special attention has been given by the track department to switch protection. There are on the system 2,074 trailing switches, of which 179 are protected. Protection is divided into four styles: Electric, lever (a Chicago Surface Lines product), spring and tongue-holding devices for paved streets, and the standard ground throw and high stand type for open track. In 1924 only 7.08 per cent

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of derailments were due to track imperfections. In 1925 and 1926 there was a further reduction of 6.05 and 5.83 per cent respectively.

In the matter of welding thermit joints, the Chicago Surface Lines has some interesting figures to show. It has been possible to weld approximately 2,200 joints without a single runout, more than 400 per cent more joints than experts declare can be expected. Competent supervision before the process starts has resulted in obtaining 190 joints to each crucible lining. Electric seam welds with the carbon arc process, used to salvage broken electric or cast welds, have been employed with great success and without interfering with operation.

Due to the use of power machinery in maintenance of way, the labor cost and productivity show relative reductions and increases. On the basis of wages in 1921 being nearly 346 per cent over the 1913 scale and labor cost 330 per cent increased over 1913, the company found in 1926 by the introduction of power machinery that while labor rates had only decreased to 325 per cent over the 1913 scale unit labor costs had dropped to 238 per cent of the 1913 figures.

Eighty-six per cent of the track paving in Chicago is of 5-in. granite blocks from 7½ to 15 in., depending upon rail heights. In addition, 18 miles of 19-in. concrete paving has been laid, the rails being flanked by granite blocks.

Power for the 1,080 miles of track in Chicago is supplied through seventeen modern substations. Some idea of the power problem may be gained from the fact that the maximum hourly system loads show an increase from 124,400 kw. in 1920 to 151,800 kw. in 1926. Although this is an increase of 22 per cent it has only necessitated increasing the substation capacity by 3 1/10 per cent. Recent figures compiled during the Christmas peak of last year revealed that the maximum hourly load on the system was 3.5 per cent above its rated capacity. During this period one substation carried an hourly overload of 40.3 per cent.

Many factors enter into this record of the electrical department. To begin with, the thermal capacity of the machines has been increased by replacing with mica tape the old-style fabric armature insulation on the synchronous converters. Perfect commutation has been secured by undercutting the commutators, and the air-blast transformers have been rebuilt to increase the amount of air circulation.

Modern type of concrete paving on Michigan Avenue at 126th Street in Chicago. The rail was installed in 1912 and 1913. Paving was placed in 1924

In line with its determination to insure a reliable power supply at minimum cost the management installed an automatic railway substation in October, 1926. This station, located in the northwest part of Chicago, is equipped with two 2,000-kw., 600-volt, 60-cycle, six-phase, compound-wound commutating pole synchronous converters that are supplied by outdoor power transformers. There is supervisory control equipment in the station that enables the operator in the nearest manually operated station to control both units and all direct-current feeders.

Experience has shown a 20 per cent reduction in the cost of maintenance and operation per kilowatt-hour converted in this type of station as compared with a manual substation of like capacity. Among other things the station includes a natural ventilating system developed by the company's men. While on this subject it is interest-

Precautions taken by Chicago Surface Lines to protect track workmen in the streets. The simple safety gate blocks the work area effectively

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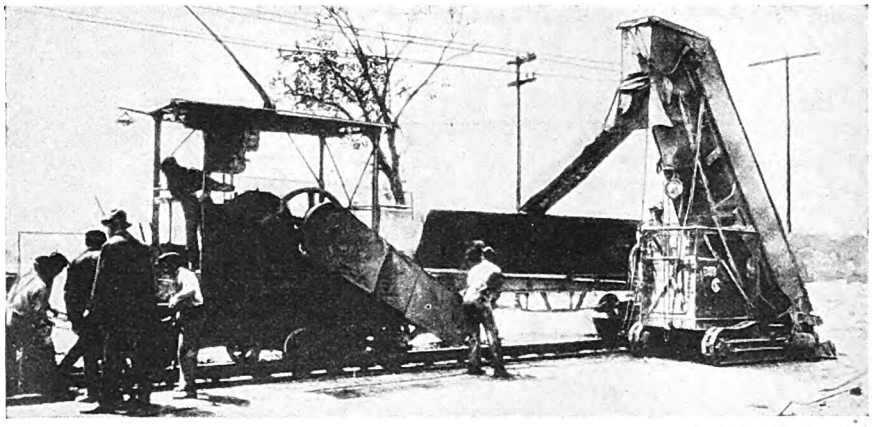


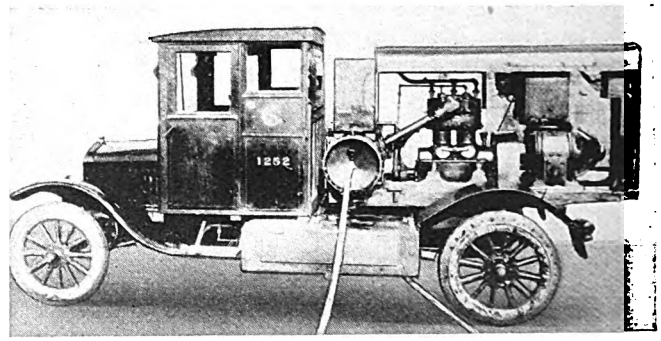
Barber-Greene bucket loader, in combination with a Drake continuous mixer, speeds concrete work in the Chicago track department

ing to note that there has been a decrease of 11.4 per cent in the cost per kilowatt-hour for substation employees during the past five years, this in face of an increase in the wage scale. Cost data on materials and supplies indicate a decrease of 23.1 per cent between 1920 and 1926.

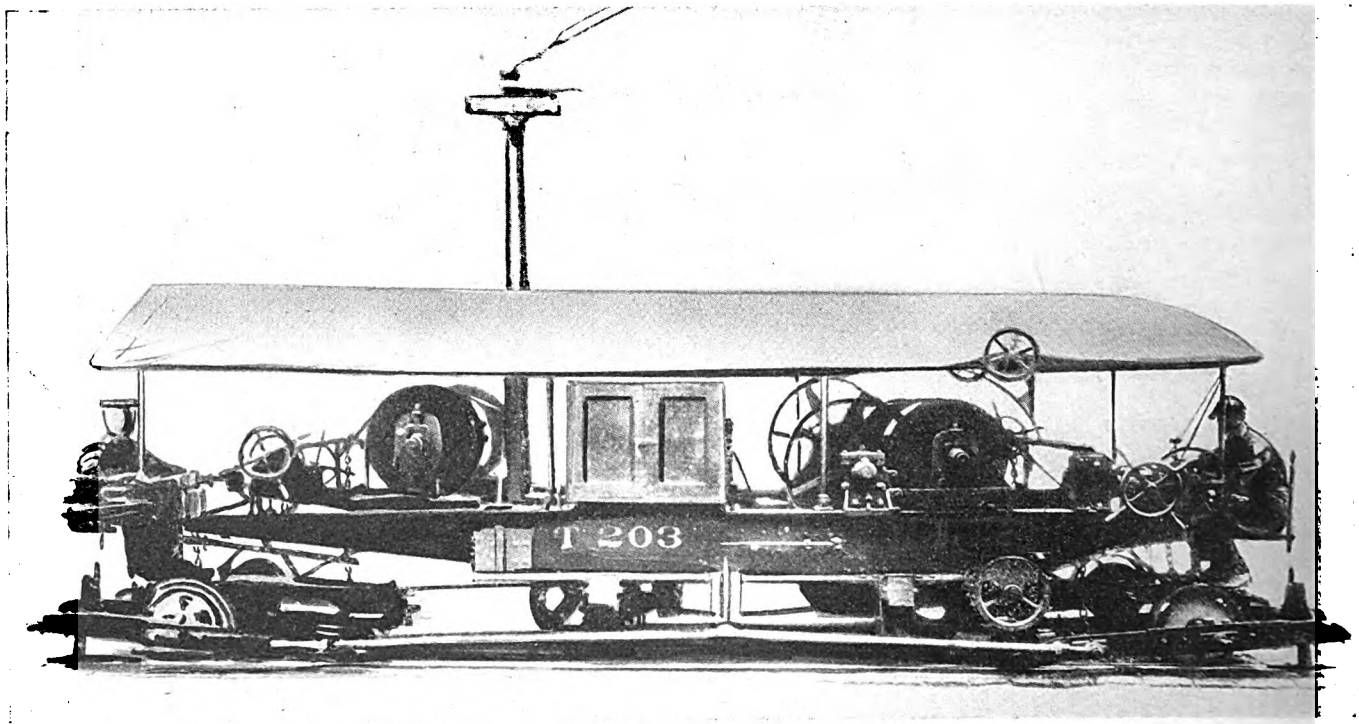
The installation of Economy meters on passenger equipment and the creation of a car meter division, which were decided upon in 1924, have brought about a marked saving in energy, represented by a 7.6 per cent gross decrease in energy consumption per car-mile measured at the car. The company points out that there is an additional saving which is not shown by this figure, due to the operation of more cars at a greater speed and that they carry more passengers than in 1924. Included in the organization of the car meter division are twelve supervising motormen who act as energy-saving instructors for the system's twelve transportation districts. These men, through the medium of accurate records of the meter readings for all motormen, are able to segregate the inefficient operators for the purpose of giving them special instruction. As an incentive toward power conservation, contests are conducted among the twelve divisions, the one making the best record receiving a flag trophy.

In order to maintain the 3,500 meters in use by 7,000 motormen there has been developed and turned out from the company's shops a meter test car—which is an electrical testing laboratory on wheels. This unit is equipped with standard trucks, four motors, control apparatus and air brakes. One-half of the car contains power generating and distributing apparatus, small tools, storage batteries, etc. The other end contains facilities for cleaning, repairing and calibrating.

To prevent mercurial poisoning special equipment was designed by the company's engineers to take care of cleaning the meter mercury. For the past three years the maintenance cost per meter per year (exclusive of overhead) was: 1924, $1.81; 1925, $1.64, and 1926,



An Ingersoll-Rand Model 20 air compressor of 20 cu.ft. displacement, mounted on a Ford chassis, provides a flexible and efficient compressed-air unit for trackwork



Rail corrugations in Chicago are removed with a Kerwin double ended grinder that speeds the work and reduces cost in comparison with a single machine

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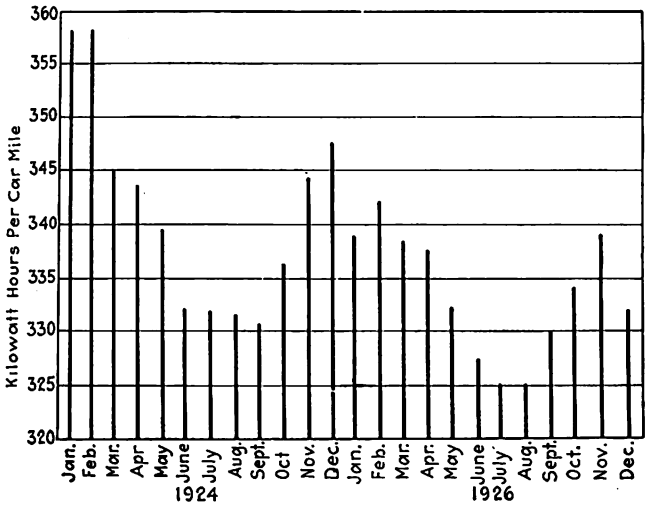


The Chicago Surface Lines energy economy story at a glance. The saving during the winter months is particularly important, since that is the period of peak demand

$1.59. The energy saving resulting from the use of meters has permitted car-miles operated since January, 1923, to be increased 8.4 per cent with little attention given to increasing distribution copper.

By the use of outdoor-type automatic reclosing circuit breakers for equalizing positive feeders, there has been a marked increase in trolley voltage that has obviated the necessity for adding positive feeders. This device is used to adjust the load between heavily and lightly loaded districts. A large investment for additional copper also has been avoided because the primary distribution system was originally designed on such a liberal basis as to permit of increasing loads.

From the standpoint of maintaining a constant flow of power in any eventuality, the Chicago Surface Lines employ most of advanced ideas and equipment known to the industry. Through the medium of a well-organized welding force, both on the line and in the shops, poles are kept in constant repair. In the street, where poles have failed at the joint and ground line, it is the practice to weld sleeves around these breaks. Experience in this class of reclamation work shows that the cost of welding is about 30 per cent that of a new pole. In the case of roadways that are being widened, where a 32-ft. pole is needed instead of one 30 ft. in length, the 2-ft. welded extension is made at about 10 per cent of what a new installation would cost. Welding is also being effectively used to reclaim broken poles, truck frames, gear cases, broken air compressor frames, broken brake-beam and truck castings, and a thousand and one auxiliary parts used on the property.

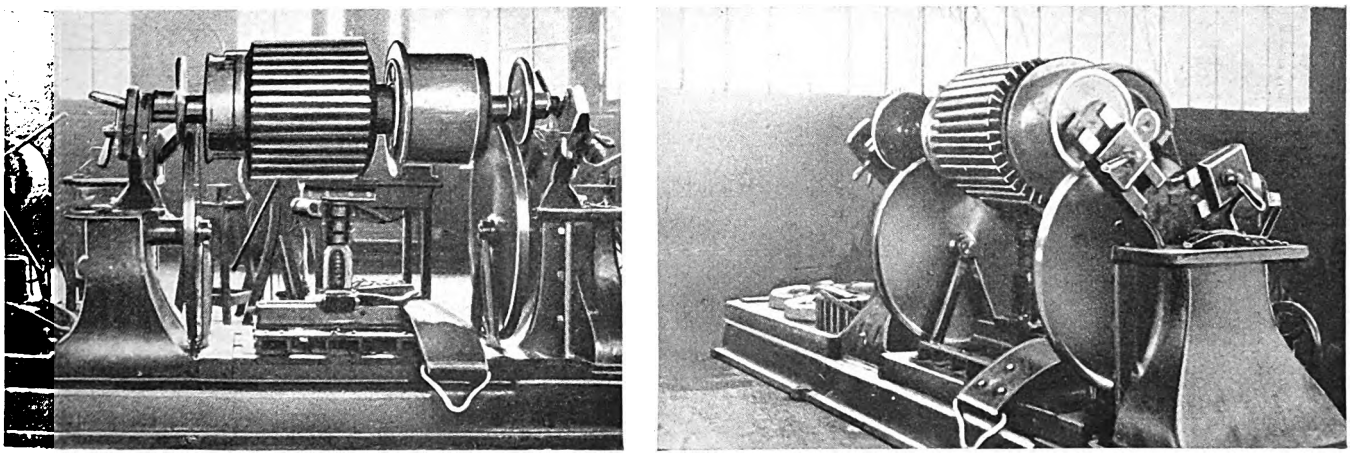
As the line of defense to insure an uninterrupted power supply, there is maintained a motorized department for maintenance and construction. Of the ten tower trucks owned, three are assigned to emergency patrol and are fully equipped to meet any trolley situation. There is one truck for each emergency district. Five of the tower trucks are of 3½ tons capacity, these having been bought in 1926 to replace obsolete equipment. Some idea of the economy effected by motorization is gained by the following comparison of former and present unit equipment. In place of four tower wagons, two reel wagons, fourteen horses, six teamsters and 22 men formerly required, there are now two tower trucks, one express truck with a reel rack, three chauffeurs and nine men. Recently a combination cable puller winch and pump for pulling lead-covered cable was acquired. This is mounted on a truck that is of sufficient dimensions to carry the equipment necessary for complete cable installations, including two large reels.

Balancing Armature Cores in Paris

SO MANY opportunities exist for an armature spider, core and commutator assembly to get out of true it is not surprising that many of them are out of balance when they are received in the electrical shop for rewinding. The effect of any considerable unbalanced weight in a rapidly moving armature necessarily is added wear on the bearings and strain on the housings. Recognizing this, the Metropolitain Railway of Paris, France, tests all armatures on a balancing machine before they are rewound. Two views of this machine, which is known as an "equilibreuse" and is manufactured by Jost & Company of Paris, are shown herewith.

The machine has two large disk wheels, one at each end, on which the armature is placed. These wheels are mounted with ball bearings so that they will allow the armature to turn freely. There is a pair of smaller ball bearing disks at each end, placed so that they will restrain the armature shaft and keep it from riding over the large wheels, thus preventing the armature from rolling off the machine.

The armature is delivered to the balancing machine



Two views of the armature balancing machine used in the shops of the Metropolitain Railway of Paris. The cores are equalized on this machine before being wound

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by a travelinig crane. It is carried in a leather sling, of a type used to some extent in American shops. In order to prevent the possibility of damage to the delicate portion of the mechanism the armature is lowered onto a screw jack. shown in the center between the main bearings. The weight is then transferred to the balancing wheels without shock. After being set in place the armature is leveled up with a spirit level, then turned slowly two or three revolutions and allowed to come to rest. If it is heavier on one side, it will oscillate back and forth, finally coming to rest with the heavy side downward. It is then possible for a workman to add sufficient weight to the lighter side so that the core is completely balanced, which is indicated by lack of oscillation, the armature slowly coming to rest. The weight is usually placed on the pinion end. Sometimes as much as 10 lb. is required, while for other armatures ¾ lb. or less will suffice.

Incidentally, all of the armatures used on the Metropolitan are wound with copper strap instead of wire. Each slot holds five of these straps formed to shape, taped individually, then placed together and taped again. The conductors are placed in the slots in mica troughs covered first with insulating paper, then with two sheets of oiled linen, then with another sheet of insulating paper. The upper coil is held down with a wooden wedge extending the entire length of the slot, being dovetailed into its sides. The wood used for the purpose is hornbeam, which is quite similar to the American water beach, from which the elastic tips for fishing rods are usually made.

Rehabilitated Cars Secure Patrons for Railway

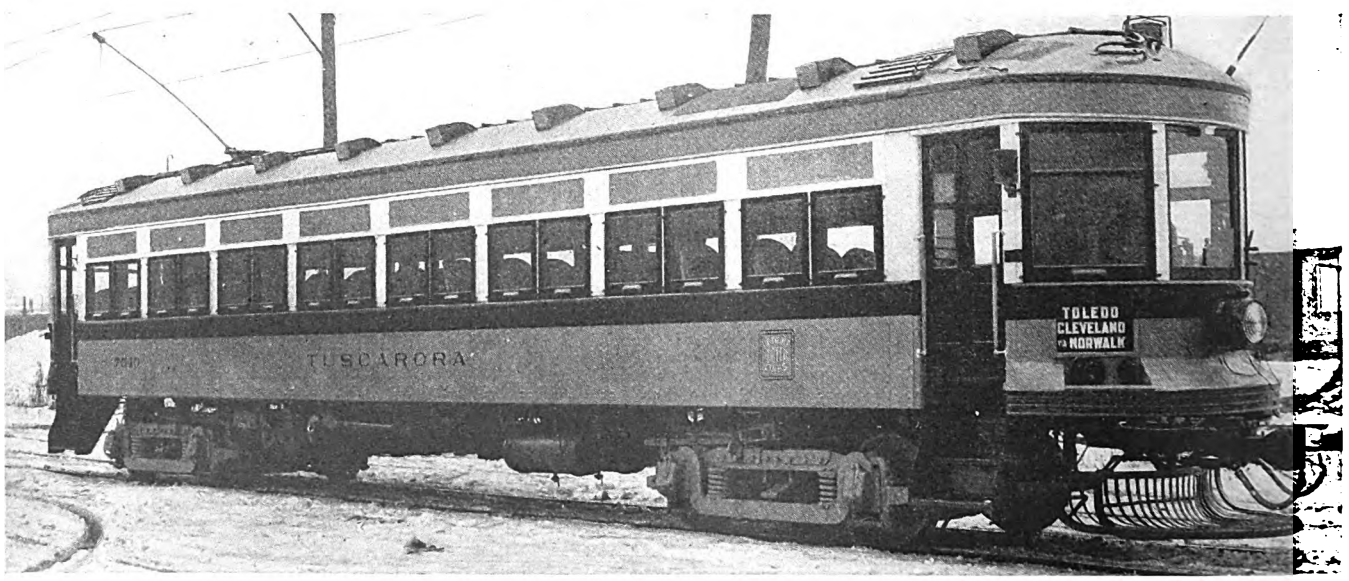
"TUSCARORA" is the name for one of two rehabilitated cars recently put in service between Detroit and Toledo by the Detroit, Monroe & Toledo Short Line Railway, Detroit, Mich. Plans for their rehabilitation included the placing of individual, fully cushioned seats of the bucket type commonly used by de luxe motor coaches. The cars are also equipped with a baggage rack

What the Detroit, Monroe & Toledo Short Line Railway has done in the way of rehabilitating some of its rolling stock. A baggage rack is located at the end of each car, where free checking obtains

on the rear platform for the free checking of passenger hand baggage by the conductor. The seats are individual chair type, leather upholstered.

"We have had," writes Mr. Roger, "a great many favorable comments from our patrons on this type of seat and they are attracting some business to the rail line from the coach line. The equipping of the two cars now in operation was accomplished by removing the old type seats from two of our all steel cars, repainting the exterior and interior and giving each car an individual name. Our intention is to equip other cars in a like manner as conditions will warrant and operate them in limited service on our principal lines, including the line between Detroit and Cleveland."

Commenting further on the construction of the cars, Mr. Roger continues: "The idea of the baggage compartment on the rear platform has been received favorably by our patrons. This was installed to avoid the unsightly overhead baggage rack and to avoid the necessity of having to bring baggage into the main section of the car, where it is more or less in the way of the passenger.



The "Tuscarora," an old car in new dress which is attracting patronage for the Toledo Short Line Railway

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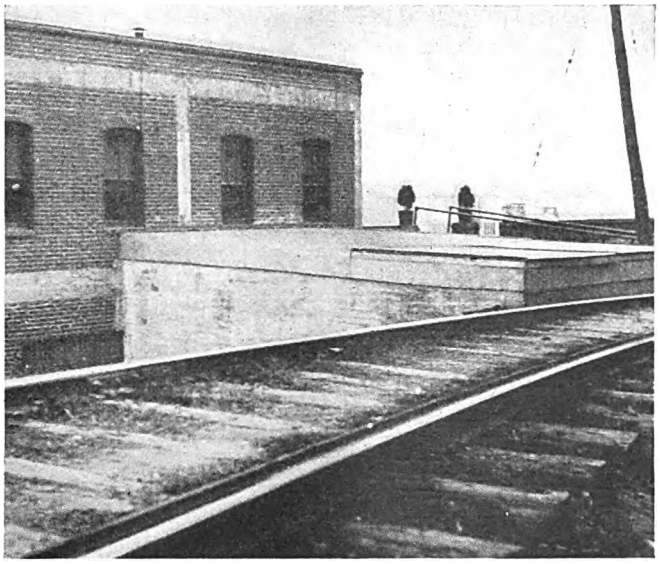
Home for Way Department Made from Carhouse

Shop, storage and sand-drying plant made from abandoned building in Richmond, Va. All maintenance of way and construction forces concentrated at this point

Plenty of room is provided for the storage of maintenance of way materials in this converted carhouse

SEEKING a suitable headquarters for the maintenance of way forces, a substantial brick and concrete building approximately 280 ft. x 75 ft. has been remodeled at small expense by the Virginia Electric & Power Company, Richmond, Va. A 12-in. brick wall extending across the entire width of the building divides it into sections 212 ft. long and 67 ft. long respectively. The 67-ft. section contains three rooms separated by brick walls, as shown in one of the drawings. The machine shop, blacksmith shop and dry sand loading room is approximately 59 ft. x 67 ft., the sand room 35 ft. x 15 ft. and the storage room 31 ft. x 15 ft. Wide doors permit easy entrance of motor trucks and cars. The larger section of the building is used entirely for storage of maintenance of way material.

The building was constructed for a carhouse by one of the predecessor companies, but after the consolidation it was abandoned. It is, however, in an excellent location on a main line and within 500 ft. of the Southern Railway. The ground adjacent to the building is cut by a ravine some 20 ft. deep for practically its entire length. This provides a good place for disposal of excavated material and other waste. In the course of time the filled property will become valuable.



The roadmaster's office is accessible from the main line track above the sand-drying installation

Three tracks run into the building and one along the ravine, all being connected to the main line. The center track runs entirely through the building, connecting with the ravine track front and rear, while the others end at the dividing wall inside the building.

Special work and rails are stored along one wall inside the building, while on the opposite side are miscellaneous supplies. Between the ravine track

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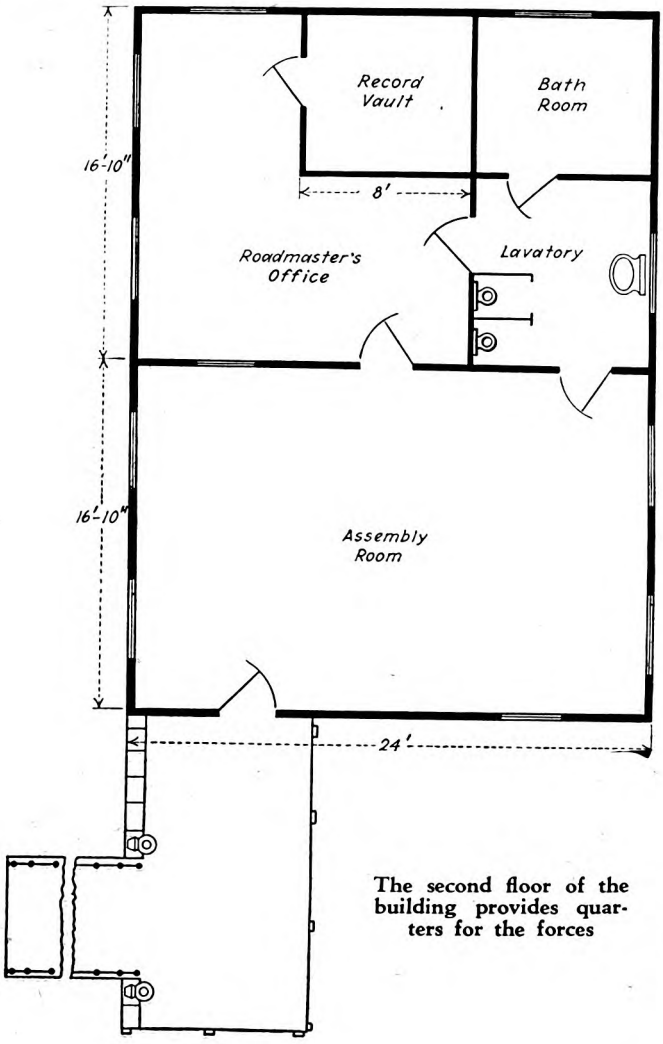


The second floor of the building provides quarters for the forces

and center track are bolts, spikes, tie rods, plates, etc. To facilitate the handling of the material by a motor truck a 6½-ft. paved driveway runs from the main road to the dividing wall within the building.

Sand-Drying Equipment

A feature of the installation is a complete sand-drying plant. A wet sand storage bin of 156 cu.yd. capacity has been installed adjacent to the main line track, which is high enough that sand can be dumped into it direct from flat cars. This bin is 18 ft. x 26 ft. with 12-in. reinforced concrete walls. The floor is inclined, with a maximum depth of 18 ft. A chute from the lower end of the bin permits delivery of wet sand by gravity to the sand-drying room. One-third of the bin has a hinged cover, while the balance is covered with reinforced concrete.

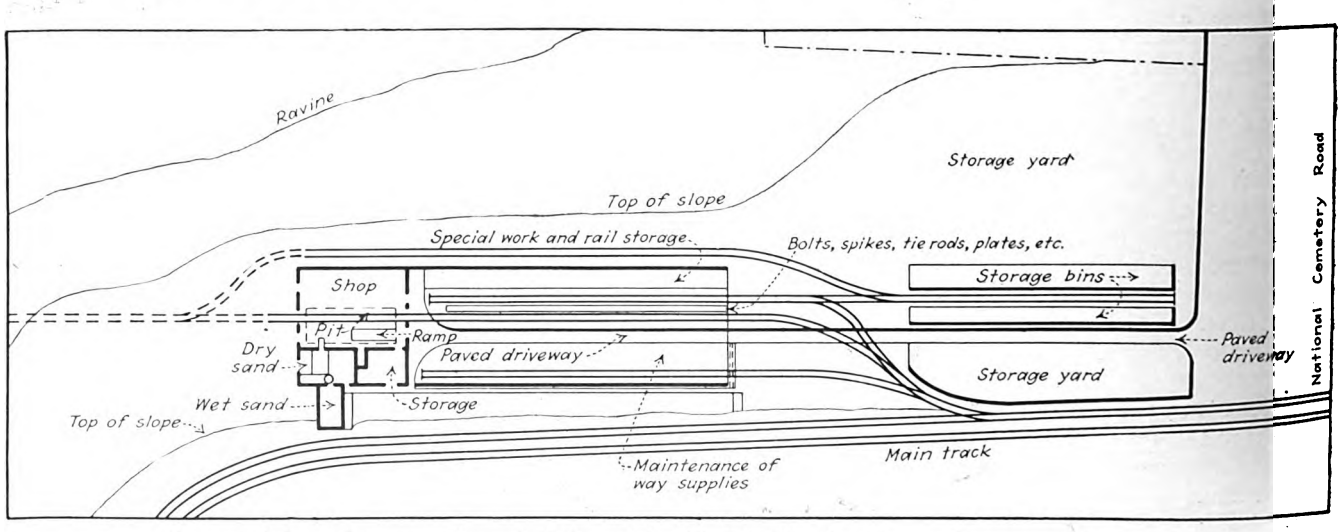
The drying room is equipped with a sand-drying stove and a reinforced-concrete dry sand bin, built in two sections, one for reserve with a capacity of 25 cu.yd. and the supply section 12½ cu.yd. The inside dimensions are 9 ft. x 15 ft. The reserve bin is 5 ft. deep, while the supply bin has an inclined floor, with a depth of 5 ft. at the lower end. A chute from the supply bin passes through the brick wall, entering a pit in the machine shop, which is 15x60 ft. A 6-ft. ramp 30 ft. long is built in this pit directly in line with the driveway, so that motor trucks can be loaded with dry sand by gravity. The only manual labor required is that of shoveling the wet sand into the stove and the dry sand into the storage bin. Members of the regular organization do the work, since emergency men are on duty day and night. An average of 8 cu.yd. of sand is used daily.

It is planned to install suitable equipment in the machine and blacksmith shops for the way department's maintenance work. The expectation is that this arrangement will prove economical and decrease delays while waiting for other departments to do work.

A floor over the sand-drying section of the building is used for the roadmaster's office, record vault, bathroom, lavatory and assembly room. This has an area of 25 ft. x 34 ft. During inclement weather the assembly room is used for foremen's conferences for discussion of maintenance of way problems and the advancement of a program for closer relations.

Boston Elevated Announces Educational Program

ANNOUNCEMENT has been made of the Boston Elevated Railway's educational program for 1927-1928 in a pamphlet recently issued to the company's employees. The program for the year is simple but varied, including some popular courses offered in previous years and two or three new ones. The schedule, which has been arranged so that employees can get a



Layout of the maintenance of way building of the Virginia Electric & Power Company at Richmond

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variety of opportunities, includes the following subjects: Supervised reading, history-making events of the day, public speaking, correct English, investing savings, increasing personal powers, every-day law, fabric painting, maintenance of automotive equipment, and psychology of personality. In addition there will be foremen conferences and group conferences in various departments.

In the announcement, Edward Dana, general manager, stated in part: "On Nov. 1 we open the fifth season of the Boston Elevated educational program. The enthusiasm which marked the closing exercises last May showed that the courses had met a real demand on the part of a large number of employees. The aim of the educational program is to meet the needs of Boston Elevated men and women who realize that their personal satisfaction and their progress in the industrial world depend upon their mental capacity and alertness."

New Bus Repair Shop in Los Angeles

Particular attention has been given to provide a well-lighted and ventilated building. Fourteen pits provide repair space for 30 buses at one time. Two 5-ton electric cranes handle material

RECENTLY a new bus inspection and repair shop was completed by the Los Angeles Railway, Los Angeles, Cal. The building is 100 ft. wide and 310 ft. long. It is of brick, steel and concrete and is equipped with a wet pipe automatic sprinkler system.

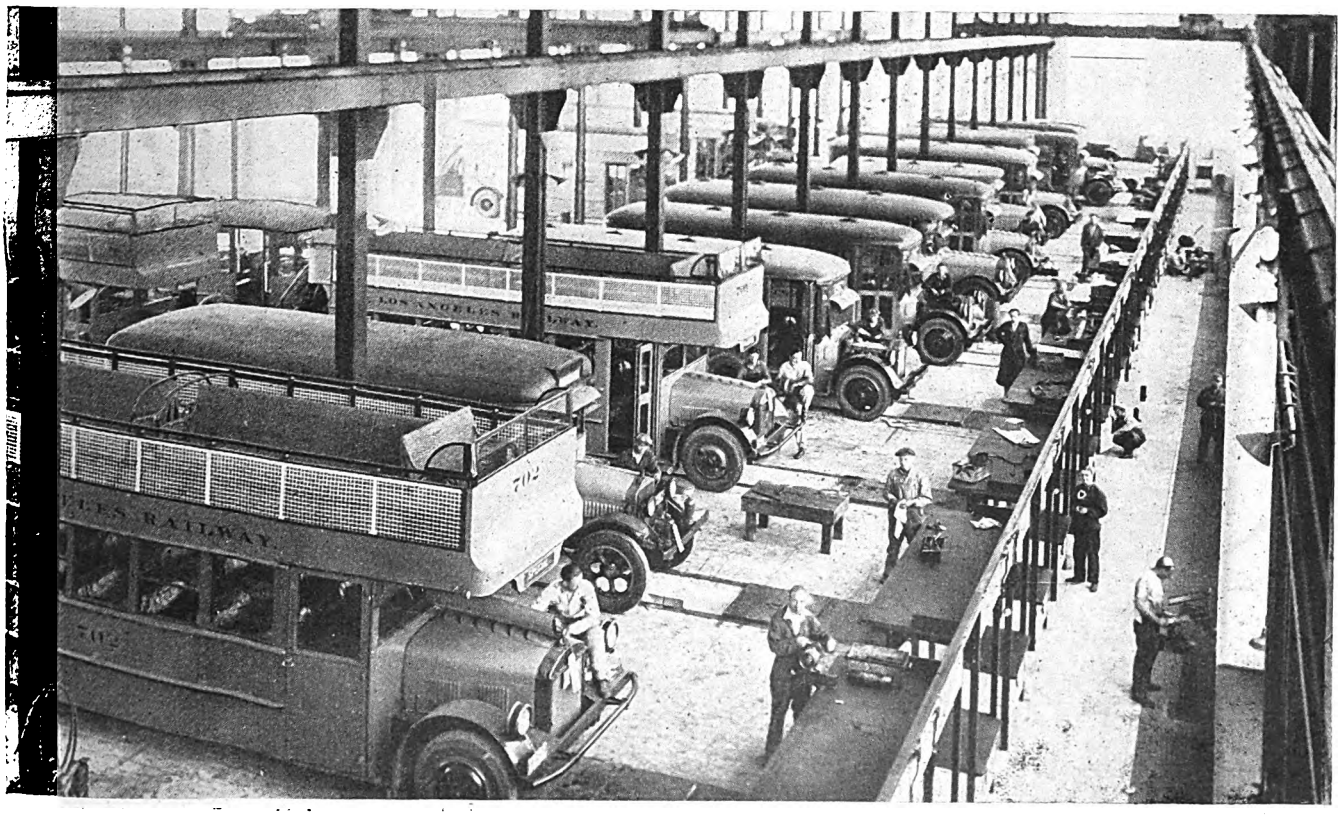
To provide the most modern mechanical equipment for the inspection and repair of the fast-growing fleet, engineers of the Los Angeles Railway made a comprehensive study of desirable features. Particular attention was given to the lighting and ventilating of the building, with a view to facilitating the work and improving conditions for the mechanic. There are three bays to the building and the three roofs are arranged in sawtooth fashion, each section being equipped with skylights running its entire length.

Windows along the north side of the building run the entire length, each window being 12 ft. wide and 24 ft. high. They are arranged so that each workman's bench has an individual window. Buses enter the building through the south side, the floor of the garage being on the same level as the yard. Fifteen pits running crosswise of the building accommodate 30 buses at one time for inspection and repair. Each pit is 3 ft. wide and 4 ft. 6 in. deep and is equipped with recesses for tool boxes and electric lights for the mechanics.

In addition to these, a main pit runs lengthwise of the building on the north side and the fifteen cross pits open into this main pit. In the main pit there are workbenches on both sides and on the south side tool cupboards or lockers are provided, so that each individual mechanic has one assigned to him. Between these tool lockers are steps to the floor level. The mechanics on the floor level also have their individual benches and there is no necessity for a mechanic in the pit to come to the floor level for his tools, or the mechanic on the floor level to go to the pit. All workbenches are covered with sheet iron to give increased service.

Two 5-ton electric cranes with three-motion operation do all the lifting and handling of material. They are controlled by pull handles which can be operated by the mechanics from the floor or pit level.

An accompanying illustration shows the machine shop and the tool room, which is situated at one end of the building. This is equipped with lathes, drills, etc., to take care of the numerous repair operations necessary.



General view of interior of repair section. A long pit at the ends of cross pits is used for bench work

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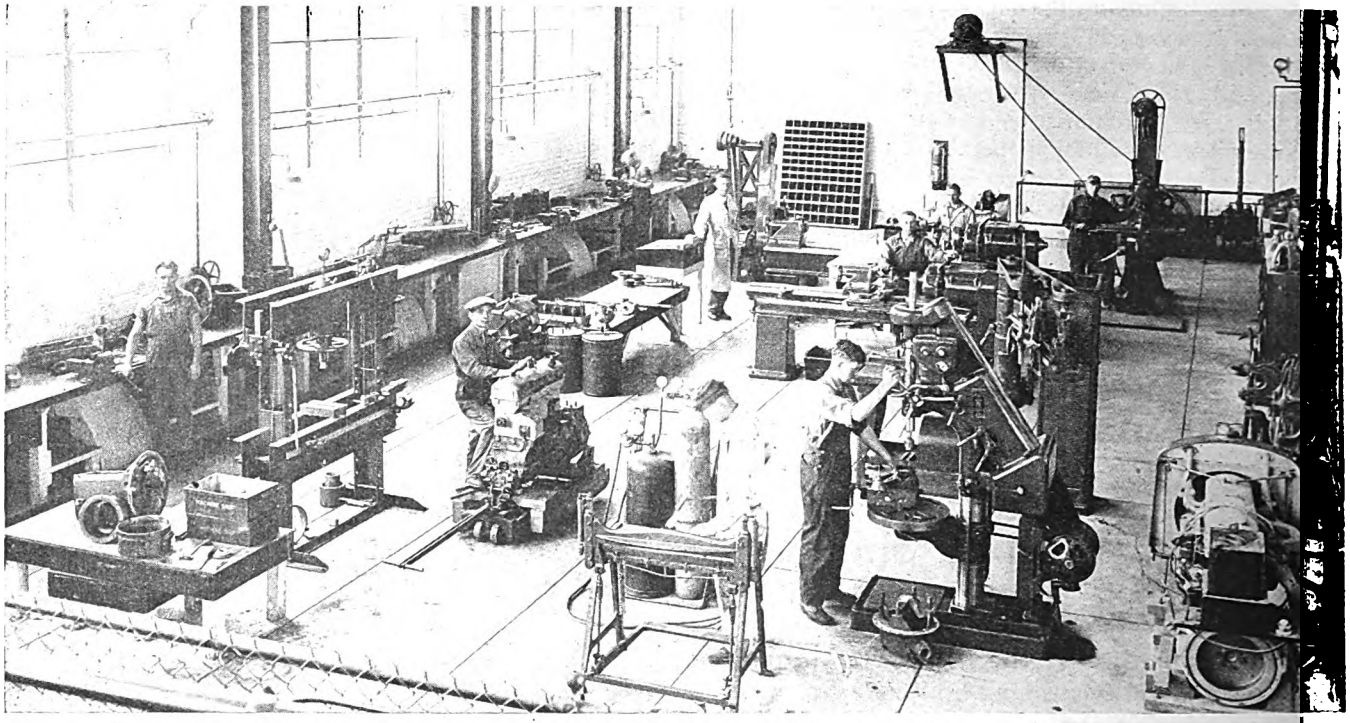
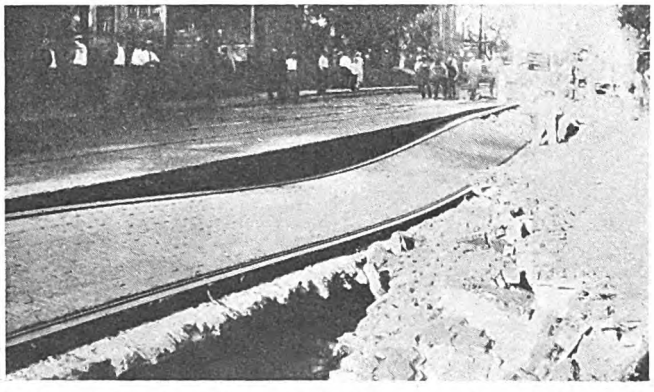


The machine shop and toolroom occupies the east end of the building. It is well equipped with the latest tools

Showers, washrooms, toilets and lockers for the mechanics are located in the basement, directly underneath the toolroom. The foreman's office, battery room and a portion of the storeroom adjoin the toolroom on the ground floor. A mezzanine floor immediately above these departments contains offices of the superintendent of automotive equipment and also the general office of the garage, together with a storeroom. This storeroom is equipped with a hydro-electric elevator for handling material between the two levels.

Car Breaks Through Undermined Omaha Track

ON THE evening of Sept. 8 a double-truck street car of the Omaha & Council Bluffs Street Railway, weighing about 23 tons and loaded with passengers, broke through an undermined section of track at 38th and Cuming Streets, Omaha, Neb. Luckily, no one was injured and the car merely received injured brakes due to the twisting of the car. The veteran motorman, who felt the car sinking and heard the noise incidental to the breaking of the pavement, applied all the power and rode the loaded car to solid street without derailment.



Section of Omaha track undermined by water from broken main

The undermining, which was caused by the breaking of a 24-in. water main, developed under a 220-ft. section and made a cavity from 7 to 10 ft. deep and from 10 to 15 ft. wide. Due to recent repaving, the escaped water could not break through the street. Following the tracks for 220 ft. it finally broke through a street fill and flowed to a low tract at the side.

It is interesting to note the track construction which supported the considerable weight before sinking. The track is constructed of Lorain rail, section 97-424, laid on 6-in. x 8-in. x 7-ft. sawn, creosoted, red oak ties, under which is 6 in. of crushed stone ballast, rolled and pneumatically tamped. Between the ties and 2 in. above is a concrete base of 1:3:5 mixture and the surface pavement is brick block grouted.

About 1,000 cu.yd. of dirt was hauled in to fill up the street. Operation of cars was taken care of through use of the other track and temporary cross-overs.

California Lumber Company Electrifies Logging Railroad

ELECTRIFICATION of the logging railroad lines of the Red River Lumber Company, whose main plant is at Westwood, Cal., is, in the opinion of officials of the company, a pronounced success. More than 25,000 cars of logs are transported per season to the mill at Westwood over 17 miles of standard gage road from Chester. In addition to the main line there are also four passing tracks totaling approximately 6,000 ft. in length. The electrification program includes the passing tracks in addition to the main line. Power is derived from the company's steam and hydro-electric plant, supplemented by the three-phase, 60-cycle, 33,000-volt power line from Hat Creek which passes the railroad at Almanor Junction. Electric locomotives are of the steeple cab type of 60 tons each on four driving axles. Each locomotive is equipped with four railway motors, rated at 200 hp. each, with forced ventilation.

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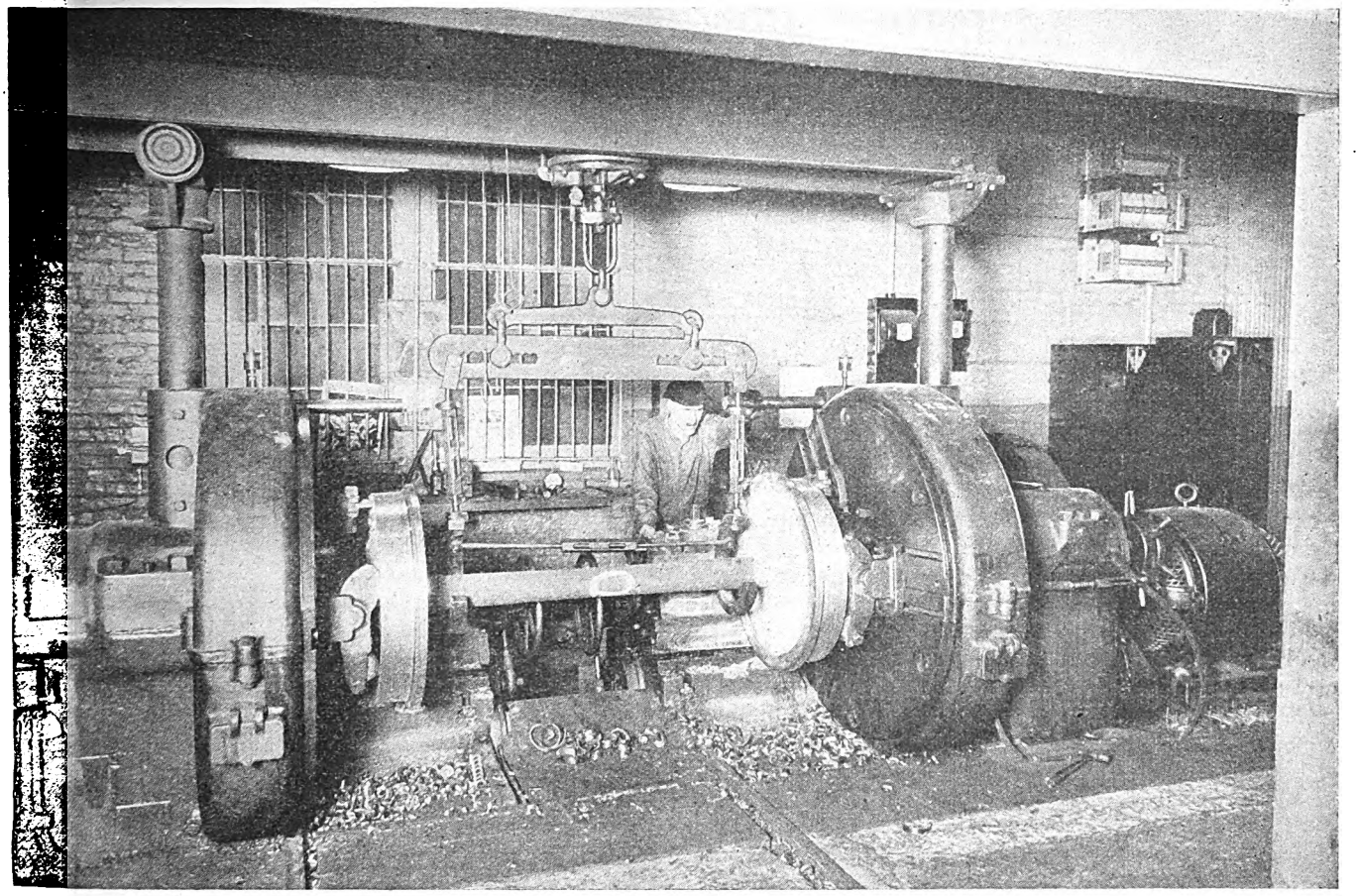
Improved Wheel Equipment
for Chicago

Turning of about 3,600 pairs of wheels annually is handled by new lathe—Efficient equipment for wheel handling and transporting between shops, together with effective wheel storage, speeds up work



This wheel lathe replaces three old ones

EFFICIENCY and speed dictated the purchase of a new high-capacity motor-driven wheel lathe for turning worn car wheels to correct contour which was recently placed in service by the Chicago Rapid Transit Company. The new machine is a Sellers lathe, weighing about 39 tons. It is set on heavy reinforced concrete foundations and inclosed in a special building at the Wilson Avenue shops.

The total installation cost approximately $35,000. It also included motor-driven tool-grinding mechanism, extra wheel storage tracks, turntables, a 4,000-lb. capacity overhead monorail system for handling wheels above storage tracks and extra tools.

This new machine now handles the entire wheel-turning requirements of the company—about 3,600 pairs of wheels annually. It replaces three old wheel lathes which had been in service from 20 to 30 years. One operator, with a helper, is able to turn more wheels on the new machine than were four operators with helpers on the old machines.

Maximum operation, however, could be obtained only by the development of efficient wheel storage and handling facilities. Therefore, three wheel-storage tracks 150 ft. long were laid out directly in front of the lathe. Each wheel storage track is served by an overhead monorail system. The three tracks terminate in a feeder track, connecting all four by means of turntables. From the feeder track the wheels run directly into the lathe. This makes it possible to pick up any wheel from any of the three tracks and by means of the monorail system deposit it on the feeder track and thence roll it directly into the lathe.

The same simplicity and rapidity of operation characterize the turning of the wheels. The lathe itself is driven by a 50-hp., 600-volt Westinghouse motor. The tailstock is moved by an auxiliary 8-hp. motor.

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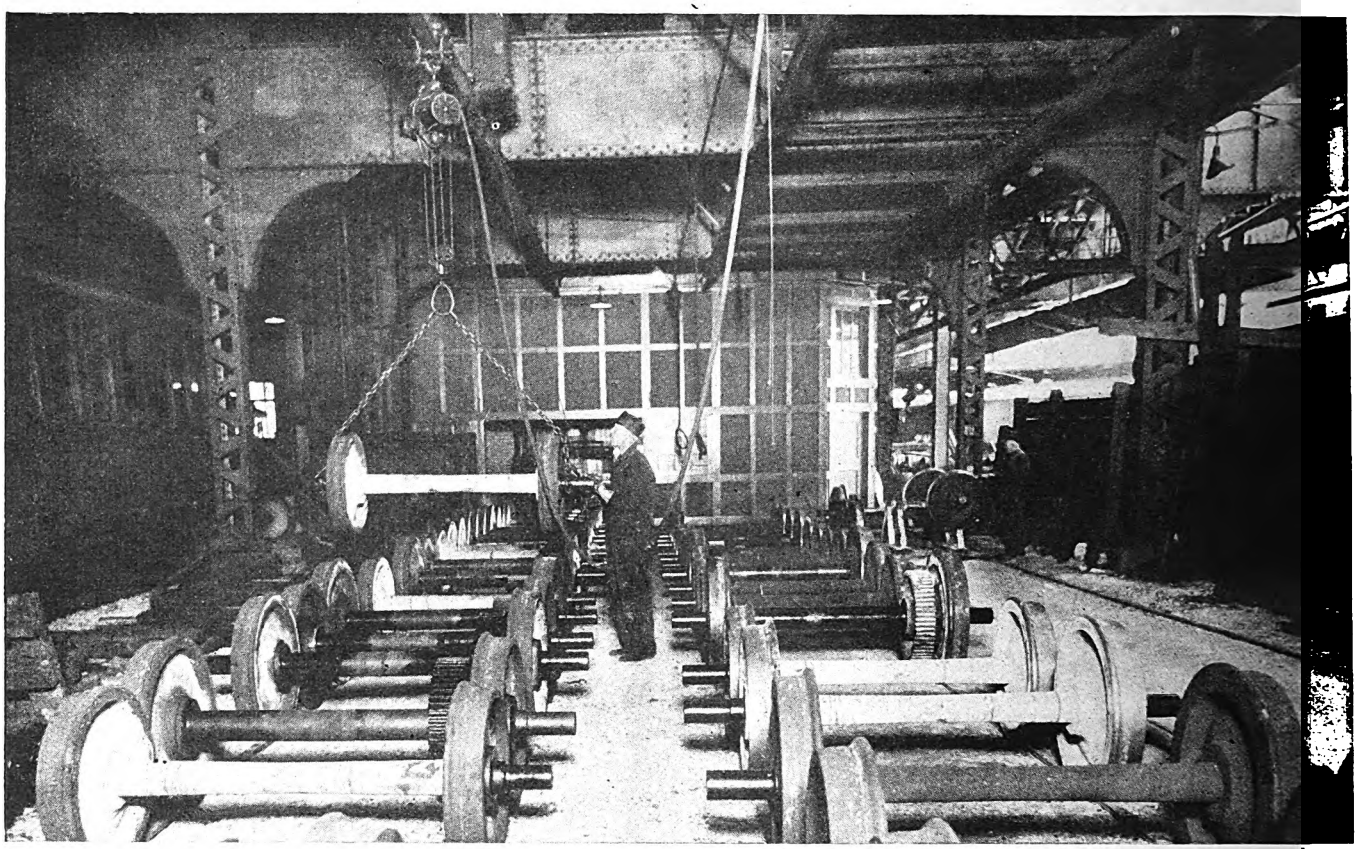


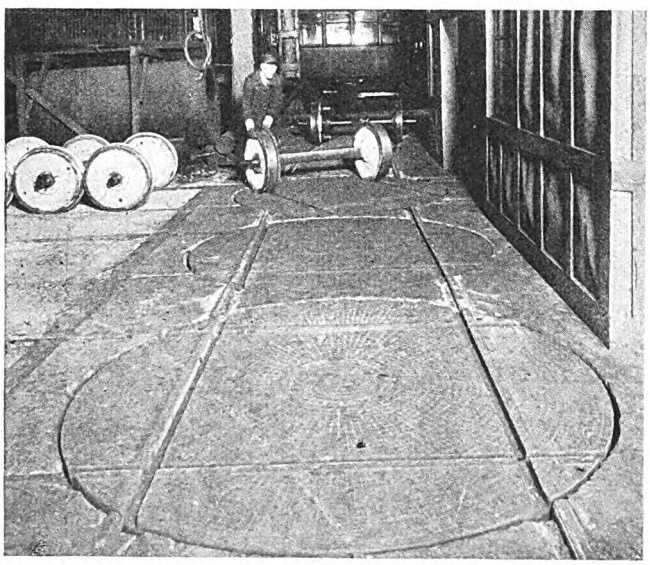
These wheel-storage tracks, each 150 ft. long, serve the new lathe

Operation throughout is largely automatic. The 50-hp. driving motor is controlled with three push buttons which actuate switches in automatically correct sequence on a control switchboard. One push button starts the motor and brings it up to maximum speed. Another stops it by disconnecting the current and applying at the same time a powerful electric brake. If an especially hard spot on the wheels is encountered, a third push button at the operator's touch automatically slows down the machine.

Wheels are rolled into the machine and then centered by means of an air hoist attachment. The tailstock of the lathe is then moved forward by means of an 8-hp. auxiliary motor to clamp the wheels in position and at the same time to adjust the driving dogs against the work and lock them in place. This auxiliary motor is controlled by a reversing controller which automatically locks the tailstock by an electric brake when the controller is turned back to the "off" position.

The tools are eight in number, of high-grade cutting metal, and four are mounted ready for work in a turret in front of each wheel. When the roughing tool has finished its work the operator releases the tool and turns the turret so that the next finishing tool is in position for instantly commencing its work.

Realization of the expected economy through installation of the new machine has come in reduction of wheel-turning costs by two-thirds.



A feeder track with turntables connects the wheel storage tracks

Wheels Handled Quickly in Chicago Materials Car

The worn car wheels are transported to the shops for turning and the finished ones are distributed by means of a special materials car designed and built by the Chicago Rapid Transit Company for the purpose. In this car, which was built by the shop forces, wheels and other railway materials are handled quickly and moved from one division to another. The car has a capacity of twelve pairs of standard motor wheels mounted on axles. Special provision has been made for handling heavy equipment to be transported. A 4,000-lb. air hoist runs through the center of the car and the I-beam which supports it has a projection outside for loading and unloading materials. The hoist obtains its air supply from the car compressor and through its use it is possible to move a full load of mounted wheels in

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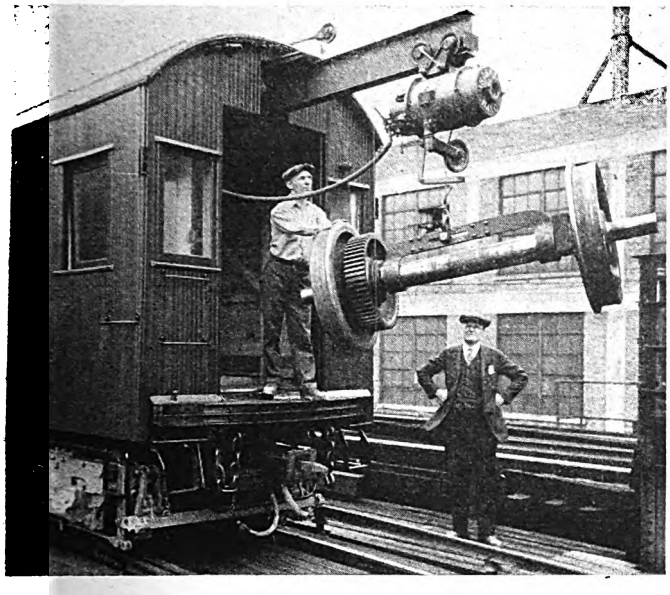
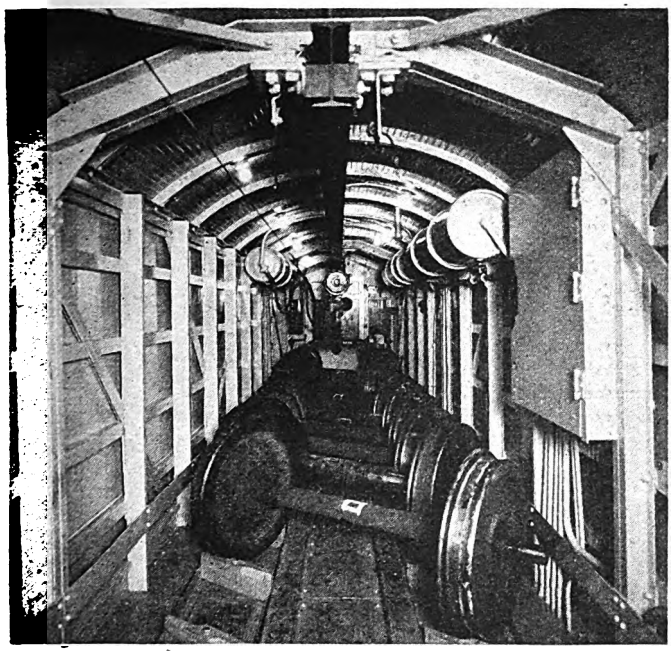


Lifting a pair of wheels by means of the air hoist



Interior of car showing air tanks on either side near the roof and supports for the I-beams of the air hoist

and out of the car in fifteen minutes. This equipment also increases the safety of handling heavy parts.

Two channel frames at the roof on either end of the car, equipped with brackets and rollers, support the I-beam trolley rail for the air hoist. This rail is equipped with a ratchet, and by means of a lever it can be extended so as to project from either end of the car the distance necessary to pick up equipment for loading or unloading. When in position it is locked securely.

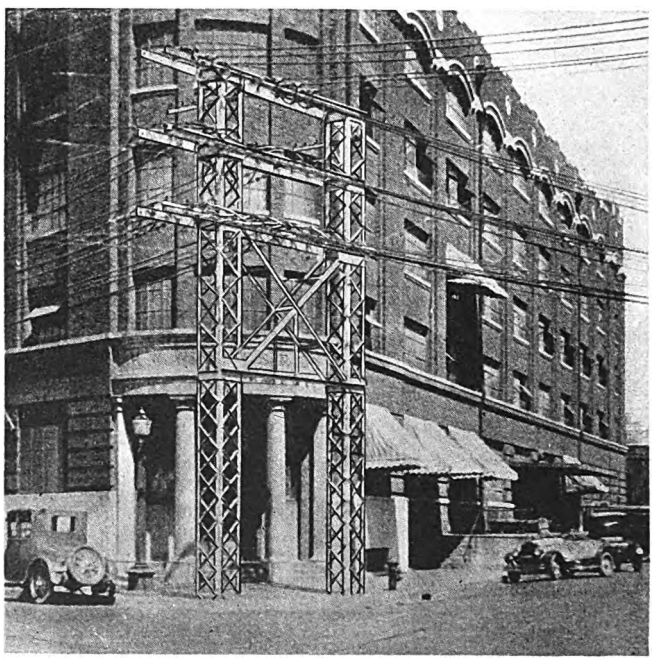
The subframe and superstructure of the car are constructed of steel and are designed so as to carry the capacity load of the air hoist to any point necessary for loading or unloading. The mounted wheels are placed in a diagonal position on the floor of the car. Substantial wooden blocks prevent any rolling which might injure the finished surface of the axles and also provide extra protection toward keeping the wheels stable while being transferred.

Steel Tower Supplants Seven Wooden Poles

POWER for operating the entire street railway system of Fort Worth, Tex., is supplied by one substation at East Front and Calhoun Streets. This station is so located that all of the feeder wires have to leave and enter it from one direction. For a long time these wires were carried on one line of poles, which had to be heavily guyed because of the tension on the feeders. One pole was directly in front of the main door of a large drug concern. All this brought about a crowded condition of both street and pavement.

A short time ago it became necessary to renew a number of these poles or to replace them with some other kind of structure. The latter plan was adopted, and the steel tower illustrated on this page was purchased from the Muskogee Iron Works, Inc. It is 40 ft. high, 5 ft. of which is imbedded in concrete. Two 2-ft. x 2-ft. towers, connected by 10-ft. bars, give a length of 14 ft. to the span. The total estimated load is 36,000 lb. The factor of safety is approximately two. Elimination of seven poles was made possible by the erection of the tower.

While the first cost of the tower was considerable, the company considers it has many advantages. One is reduced maintenance. Another is that at the corner where the tower was erected the street traffic is heavy, and with poles the feeder line had no real protection from interruption due to collisions by automobiles. The result of a bad blow from an automobile might have been a tie-up in the power supply. This, in turn, would have paralyzed the street railway transportation of the entire city. In addition to these engineering advantages, the Northern Texas Traction Company points out in its 1927 Coffin brief, from which this view and information were taken, that the appearance of the street has been improved. Many favorable comments have been received since the work was completed and the merchants near by are pleased.



This tower replaced seven wooden poles in Fort Worth, Tex. It makes the power supply more reliable and improves the appearance of the street

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Restoring Worn Fits in Motor Frames

RECONDITIONING of 164 split-frame railway motors for active service is a problem recently solved by the Northern Ohio Power & Light Company, Akron, Ohio. The work included the reboring of the frames for oversized oil-sealed housings, the building up by welding and then reboring of bearing axle seats for standard Westinghouse axle bearings and the installation of new helical gears and pinions.

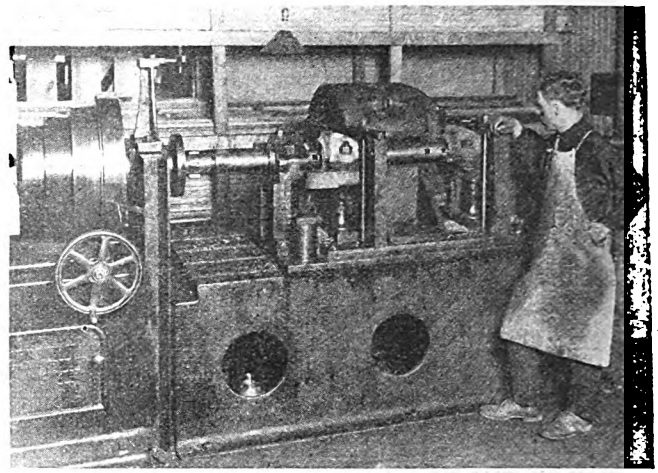
When the railway laid out a program for the rebuilding of 41 of its large city cars in order to make them suitable for one-man operation it was found advisable to overhaul the motor equipment.

At the start four cars were taken into the railway shops, the motor equipment was removed, the fields, armatures and brush riggings taken off and reconditioned and other overhauling done. Later the schedule was increased to six cars per week, which were taken out of service at one time. In the work of building up and remachining worn fits the axle bearing seats were built up by welding, this work being done by the railway company. After this was completed, the frames, sixteen at a time, were loaded on a work car and taken to the Westinghouse company's shop in Cleveland, where additional work was done. This work included careful checking of the frame, remachining of the housing fits and the complete equipping of the motors with new housing and heat-treated bolts. With the program properly organized sixteen frames were turned out every week. This met the schedule of the railway.

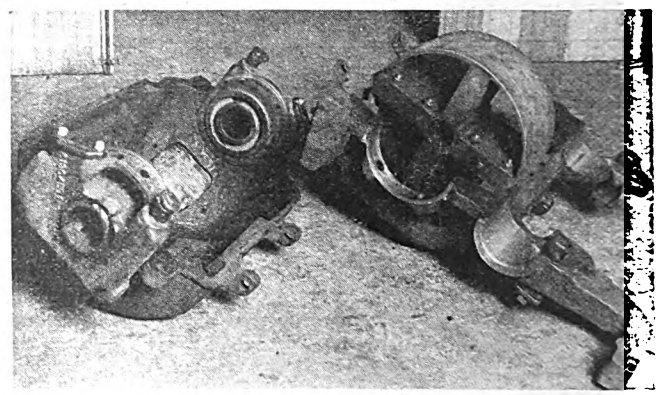
The work of machining the motor frames was done on a single spindle horizontal boring mill. The two motor halves were bolted together over a cast-iron drum, this being machined so as to fit exactly the pole piece seats. The drum was bored out in the center so as to make a perfect fit on the boring bar.

In the assembly for machining the entire motor frame was mounted on a movable plate, which after the armature bore had been made could be slid over 14 in. against a permanent stop. This brought the job in line for the second operation, of boring axle bearing fits.

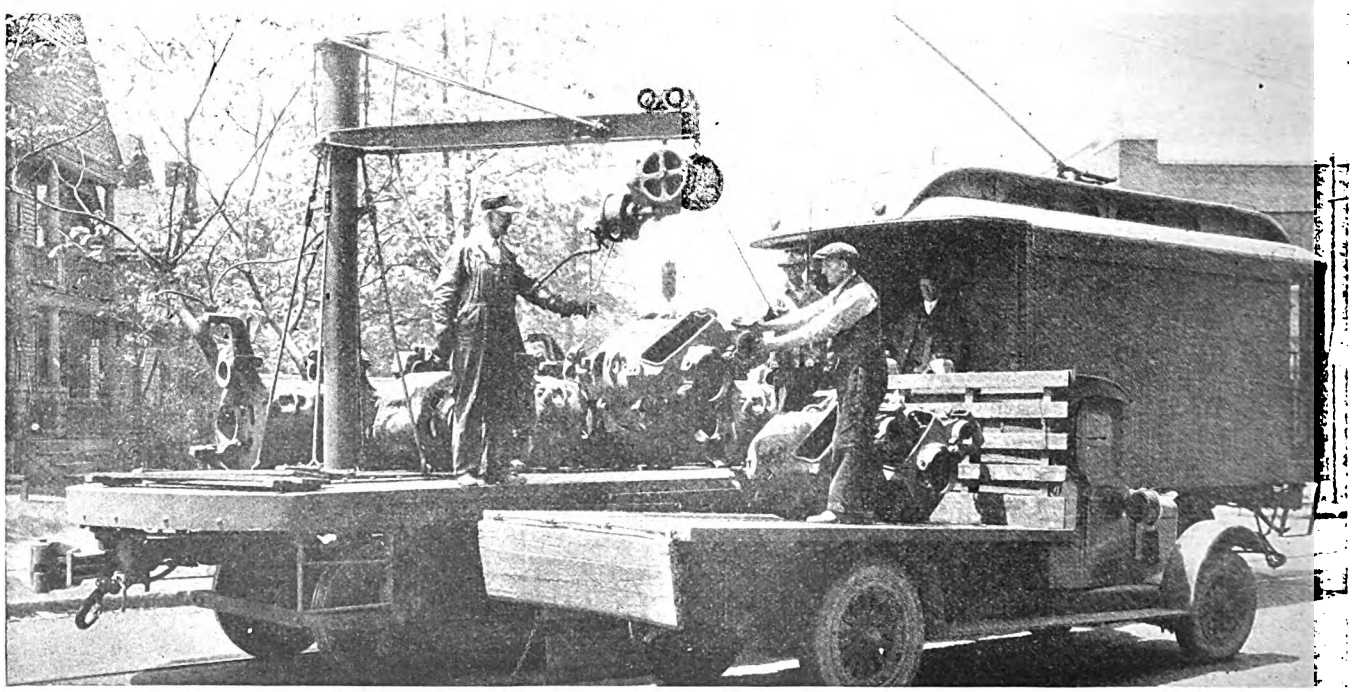
As a result of this rehabilitation work the motors are running quietly and with an efficiency equal to that of new motors.



Set-up used for reboring the axle bearing fits of the motor



A cast-iron drum accurately machined to fit the pole piece seats was placed inside the motor frame



In transporting the motor to Cleveland small trucks and a supply car were used

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De Luxe Cars Feature of New Service on Chicago & Joliet

ENHANCED by rebuilt units, a fast through electric service between Illinois cities and Chicago, with no change of cars, is now being offered by the Illinois Traction System in conjunction with the Chicago & Joliet Electric Railway. Four through trains daily in each direction connecting LaSalle, Utica, Starved Rock, Ottawa, Morris, Joliet and Chicago provide convenient service for the through traveler between the Illinois Valley and Chicago.

The new rolling stock for this service is the last word in comfort from the standpoint of the traveler. Individual cross seats, designed by Karpen, supplant the old type double railway coach seats. They are of green wicker, set low at the exact angle for comfort, which is increased by high spring backs and air cushions. Natural leather was used for the upholstery. Car floors are covered with heavy taupe linoleum. The front observation feature of Illinois Traction System equipment, popular with the road's patrons, has been retained.

Exterior treatment of the through cars includes the familiar tangerine shade on the lower part of the car, while the upper work is finished with a cream shade, with a deep mahogany trimming. The cars carry the oval traction service symbol and there is painted on the window panel and boards the designation "Chicago and Illinois Valley Limited." Work of rebuilding nine standard one-man cars to fill this service was done in the Illinois Traction shops at Ottawa.

Schedules for the through Chicago and Illinois Valley trains have been arranged to fit the convenience of the travelers between Chicago and the valley cities. From LaSalle to Joliet the tracks of the Illinois Traction System are used and from Joliet to Chicago the cars operate over the line of the Chicago & Joliet Electric Railway. There is no change of cars at Joliet. Chicago bound trains switch from the Illinois Traction tracks on Van Buren Street in Joliet to the Chicago & Joliet Electric Railway tracks by means of the new double end connection which was jointly installed by the two companies. Limited cars from Chicago to Illinois Valley points are switched to Illinois Traction tracks on the return trip. Each company uses its own operators and methods of fare collection while the cars are on its rails. The Chicago & Joliet Electric Railway at Archer Avenue is convenient to surface line street railway service to the Chicago Loop district and other points.

Fares between Illinois Valley points and Chicago by this service are substantially lower than by other carriers. Because of the lower fares and added convenience the service is very attractive.

Nine of these comfortable rebuilt units are now being operated by the Chicago & Joliet Electric in conjunction with the Illinois Traction System as the feature of a fast through electric service between Chicago and Illinois Valley cities. Tangerine, cream and mahogany is the color scheme

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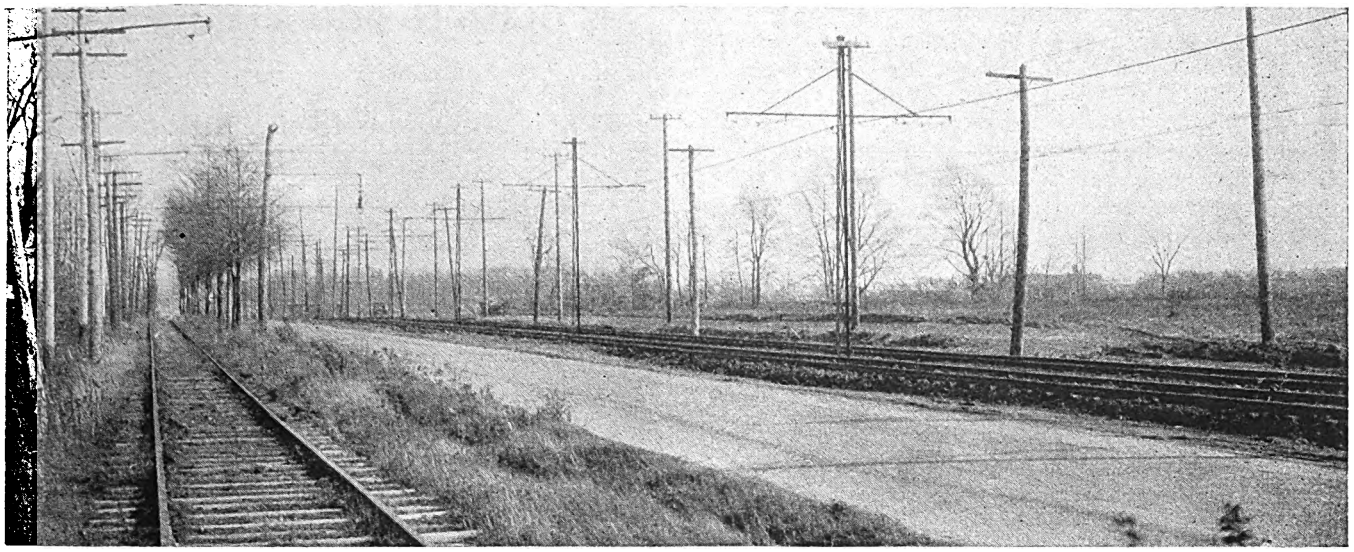


The new location of the tracks is on the private right-of-way in the center of the 120-ft. roadway, The old track at the left has been removed

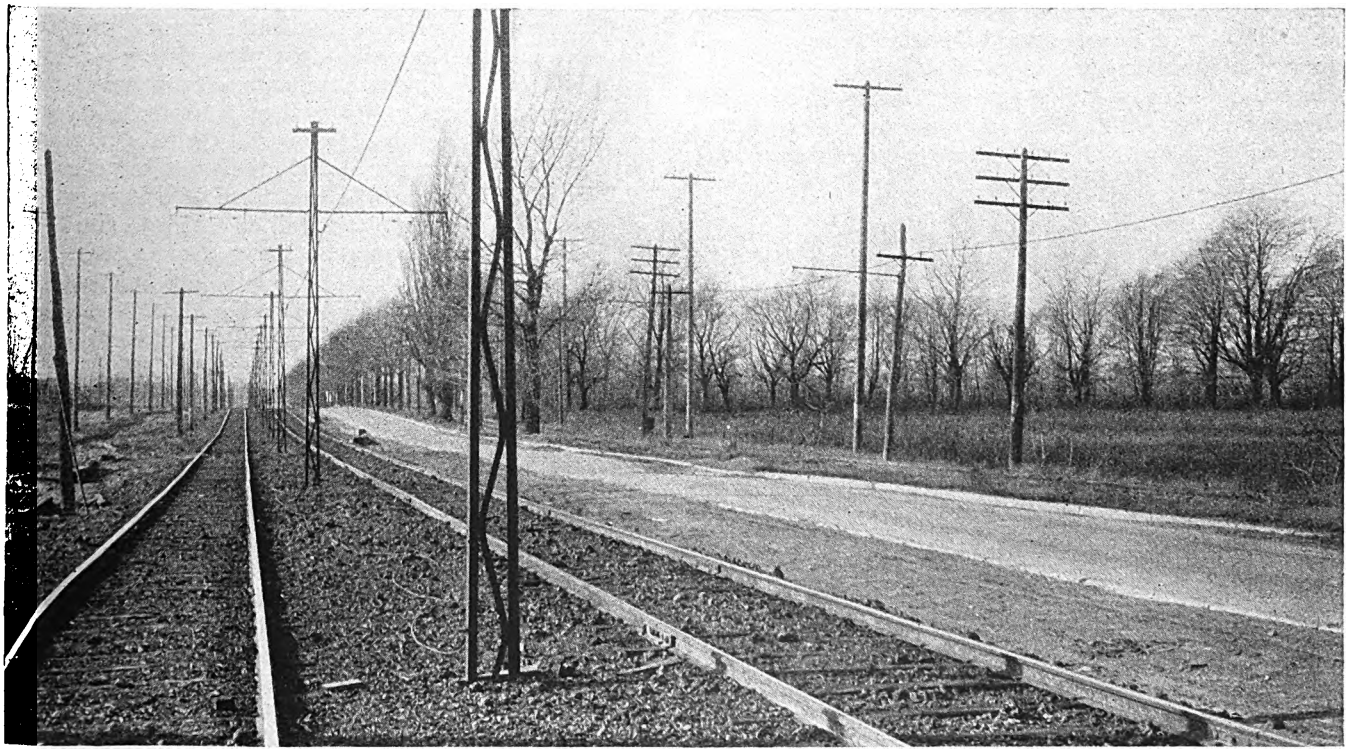
ten-minute headway of the city cars and a one-hour headway of the interurban cars.

One hundred tons of new 70-lb. T-rail was purchased and laid in the proper center location on 7-ft. creosoted ties spaced on 30-in. centers. The foundation was 8 in. of cinders, carefully hand tamped until they were flush with the tops of the ties. This initial installation permitted removal of the old rail from the private right-of-way.

When this center section of track was completed, the service was diverted to it through suitable temporary switches. The track material removed from the abandoned section and found suitable for further use was reinstalled in the new center location in the same manner, and connected with the first completed section. This method of abandoning sections and building sections was repeated until all cars were running on the new center construction.

Each rail joint was bonded with one O-B type AW-8 welded bond, and the rails were held together with six-bolt fishplates. Bracket trolley suspension was adopted as most serviceable. The brackets were attached to Bates expanded steel poles 25 ft. long, placed 6 ft. 6 in. from the track centers. Each pole was installed in a concrete foundation of 18 in. diameter, 6 ft. deep. Poles were spaced approximately on 100-ft. centers. One crossarm at the top of each pole supports two telephone wires. A 500,000-circ.mil feeder extending the entire length of the improved section was fastened to each pole by means of a bracket.

In 1901 the owners of the transportation properties of the city of Erie constructed a two-track railroad from



Appearance of the tracks and overhead construction on the 22-ft. island located in the center of the East Lake Road improvement

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the eastern end of the city to the Four Mile Creek amusement park. These tracks were laid on either side of the 50-ft. highway on a 10-ft. strip of private right-of-way.

In 1911 the tracks were extended to the Six Mile Creek and the interurban cars of the Buffalo & Lake Erie Traction Company were diverted over the line into the city of Erie. Shortly afterward the General Electric Company began the erection of a plant on a site adjoining the East Lake Road and near Four Mile Creek. When this plant was put in operation the handling of the employees over the Lake Road by rail and roadway became quite important. Additional transportation facilities had to be provided. Due to the narrowness of the roadway, it was soon found that considerable vehicular traffic congestion occurred, especially during those periods of the day when the General Electric employees were en route to and from their work. This congestion soon became so serious that it was determined that relief could be obtained only by widening the street.

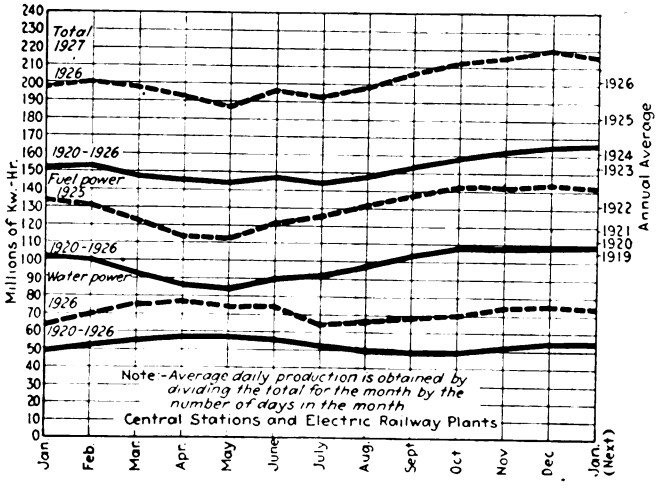
After considerable discussion between the city of Erie, the General Electric Company, the Hammermill Paper Company and the Erie Railway, a decision was reached in the spring of 1926 for the apportionment of the expense of widening of the road together with other work necessary to make the road an up-to-date transportation highway.

It was not only necessary to remove the tracks from the private right-of-way and reinstall them in the 22-ft. island located in the center of the road, but hills had to be cut away, hollows had to be filled and sanitary and storm sewers had to be installed. It was necessary to perform this work without any interruption to the street car service or vehicular traffic.

Since modern excavating and track building machinery was used throughout the entire work, it was possible to carry on the reconstruction in an efficient manner.

With the improvement completed, the Erie Railway now has a modern, up-to-date double-track installation capable of efficiently handling the additional heavy traffic. The city of Erie is provided with a broad, properly drained highway connecting with the main Buffalo and Cleveland highway via Iroquois Avenue and Harbor Creek, making an excellent entrance to the center of the city.

Average Daily Production of Electricity by Public Utility Plants in the U. S.



The Readers' Forum

Why Continue to "Soak" the Street Car for Paving?

UTAH LIGHT & TRACTION COMPANY
SALT LAKE CITY, UTAH, Aug. 24, 1927.

To the Editor:

Evolution has been taking place consistently in all branches of the street railway industry with one exception. This is the city's attitude toward paving about street car tracks, which in the majority of cities has not changed one iota from the day of the mule car. Operating conditions have changed considerably from the period in the past when companies were required to obliterate the tracks of their mules by filling in, surfacing and grading their rights-of-way on public streets. Other forms of speedy transportation have developed, with the result that today we find innumerable agencies by which people move from place to place.

Street railways whose tracks are in paved streets pay from one-third to one-half of the paving costs on such streets, yet on the basis of use made of street space and service rendered the greatest number of people per carrier a gross inequality exists because the use street cars make of streets is not equivalent to one-half of the total use made of such paved thoroughfares by all vehicles.

As to the question of street railways maintaining the pavement about their tracks and keeping the street in first-class appearance, let it be said that it is no easy matter to secure funds sufficient to maintain paving about them after expending large sums to put in the pavement. If street car companies had no paving to buy, but only the pavement about their rails to maintain, that portion of the street for which they are accountable would be the best preserved and appearing on the street.

It will readily be admitted that no business likes to spend money for something that will directly benefit its competitor, yet that is what happens when the street car company pays a paving assessment. Streets, paved and unpaved, are the thoroughfares provided by a city to handle its various kinds of traffic, and traffic of all types will use the streets. Now, when it is the duty of a municipality through its taxpayers to supply pavement, why should one taxpayer, namely the street car company, be obliged to furnish a half or a third of this street surface when it has to supply its rail on which to run?

The sum and substance of the matter is that street car companies throughout the country are, with the exception of a few that have been relieved of paving, still held in the "mule car" class, though they have no mules, whereas the trend of the times is such that the car company can't attract passengers unless it has up-to-date, speedy, modern, attractive equipment operating over smooth track. This requires money which isn't coming into its coffers, but is being diverted to and enjoyed by its competitors for whom it installs pavement. It seems time that the "powers that be" lent ear to the railway companies' side of the paving question and struck off the fetter that makes it almost impossible for them to exist, not to mention the difficulty they have in keeping in step with developments in the industry that necessitate adoption or dropping out of the ranks. The street car is a worthy utility; it is needed; it accommodates the greatest number of people for the space it occupies. Why not give it a square deal? F. D. HEIGES.

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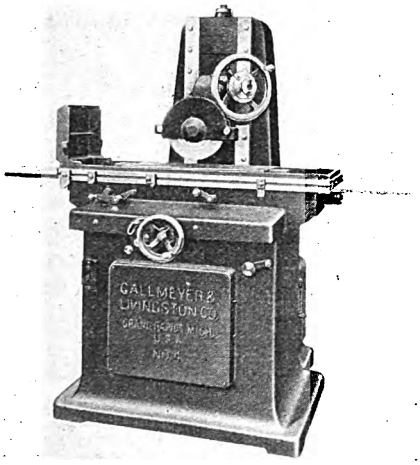
New Equipment Available

Hydraulic Feed Feature of New Surface Grinder

MORE rapid work with accuracy is provided for by a new type grinder offered to the industry by Gallmeyer & Livingston, Grand Rapids, Mich. An oil gear hydraulic feed reciprocates the table at a variable rate of travel. This provides a range up to 55 ft. per minute by turning the handle at the front of the base. The same oil gear is connected to a cross-feed engine mounted under the saddle. This is arranged so that in each reversal of the reciprocating table the cross-feed mechanism is actuated.



This grinder has self-contained motor drive in the base of the machine

The amount of cross feed for each reciprocation of the table is adjustable.

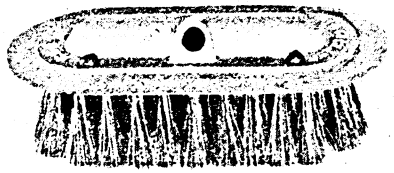
A one-piece base casting is used. The spindle head carries a very heavy spindle of 2 in. diameter by 8 in. long in the main bearing, with the auxiliary rear bearing 1¾ in. diameter by 5 in. long. For rapid raising and lowering of the operating table, a large handwheel gives a direct action to the elevating screw through a worm and gear. The handwheel is graduated in ¼ thousandths with a movable pointer, which can be set for convenient reading. A small knurled knob in the center of the handwheel provides a back-geared action to the elevating mechanism. The disk in the center of the handwheel has a graduated dial ring which can be set at zero in relation to the pointer mounted on the spoke of the large handwheel. Both inner and outer wheels turn, but the graduations on the inner wheel are arranged to read on this moving pointer, giving a vernier effect. By this means it is easy to get readings of adjustments in tenths of a thousand. This graduation makes for extreme accuracy in grinding the work.

Another feature of the new surface grinder is a variable speed for the work. Various materials call for different speeds and the variable speed feature gives greater efficiency to the grinder.

The illustration shows the machine with self-contained motor drive in the base of the machine. It is equipped for dry grinding only without any auxiliary equipment. A specially designed 10x24-in. working surface magnetic chuck is available. The machine is also offered with wet grinding arrangement, including pumps, tanks, convenient splash guards and piping if desired.

Refillable Window Cleaning Brush

WASHING of windows and other parts not readily accessible from the ground prompted the design of a combined brush and sprayer just placed on the market by the Specialty Manufacturing Company,



This new car washing brush combines the functions of a spray and cleaning brush

Cleveland, Ohio. The type illustrated is in use on several Eastern railways.

The bristles are trimmed to give a level cleaning surface and are set into an aluminum plate or block. The handle is attached to a back plate and be-

Maintenance Contest Stimulates Improved Methods

IN THIS issue is published the sixth group of articles submitted in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest. The half-way mark has thus been reached. This was celebrated in a most pleasing manner at the Cleveland convention when 100 enthusiastic maintenance men sat down to a dinner in honor of those who submitted ideas in the contest. Four capital prizes amounting to $375 were awarded and the winners were given framed certificates of award testifying to the excellence of the practices that were described.

CONTEST STILL CONTINUES

As announced in the conditions of the contest published in the April 16, 1927, issue of ELECTRIC RAILWAY JOURNAL, pages 700-701, the contest is to run a year, and a prize of $25 will be given each month. The capital prizes were awarded in the middle of the contest instead of at the end because the convention offered the best opportunity of getting the various contestants together. Those who were present at the meeting were impressed particularly with the value of a broad interchange of ideas among maintenance forces. The greatest good will come from the contest by increased use on other properties of the practices which have been found of value on the railway from which the idea came. Maintenance men help put railway maintenance on the high plane necessary for popularizing electric railway service by submitting their ideas in the contest. Incidentally they may win one of the monthly prizes.

CONTEST CONDITIONS

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York, N. Y. To be eligible for the monthly prizes manuscripts will be received until April 30, 1928.
7. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
8. Details of the conditions not given will be found in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

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tween this and the front is a hollow space made watertight by means of a rubber gasket. A length of pipe attached to a hose is screwed into a threaded opening in the back plate. Water is forced through a number of fine holes into the front plate.

The edges of the gasket project well beyond the edges of the aluminum water chamber so that the metal itself cannot hit the surface being cleaned and the brush plate may be shifted around on the handle easily so as to wear all bristles equally. When completely worn out the brush may be returned to the factory for refilling at a small cost. The manufacturers claim that this more than compensates for the somewhat higher initial cost as compared with ordinary brushes.

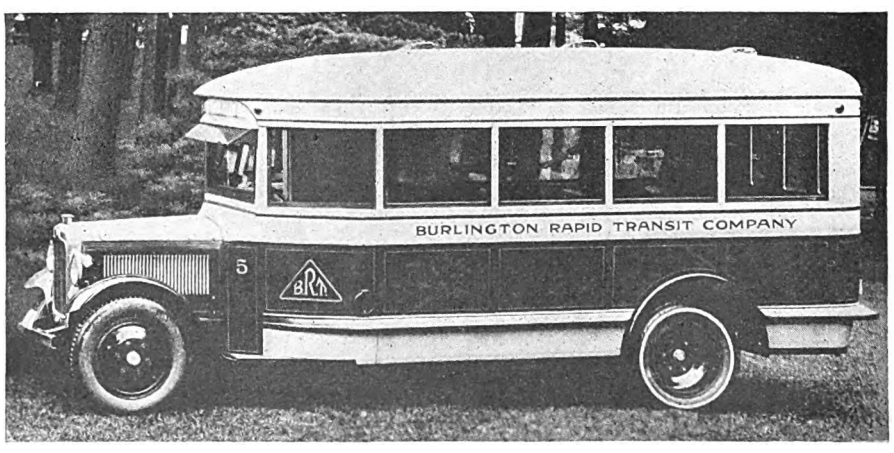
Six-Cylinder Bus Chassis Supplants Four

SIX-CYLINDER engined bus chassis to supplant former four-cylinder models are announced by Graham Brothers, Detroit, Mich. Special features include four-wheel Lockheed hydraulic brakes, four-speed gearset and ball-bearing cam-and-lever steering gear.

Although hoods on the new model are 7 in. longer than on the former units, there is no increase in wheelbase. By maintaining the 162-in. wheelbase better weight distribution on the axles is said to result. The present line includes a 21-passenger street car, 16-passenger de luxe parlor car and de luxe club car seating 12 passengers.

The engine is of the L-head type with a 3¼-in. bore and 4½-in. stroke. Camshaft and crankshaft are drop forgings. Pistons are of aluminum alloy with cast-in steel struts. Oil circulation to main bearings is taken care of by a geared pump. The system also includes an oil filter and a siphon arrangement to provide against stoppage of oil flow should the strainer become clogged. Electric equipment includes a 225-watt generator with voltage regulator and 215-amp.-hr. storage battery.

Rear springs are of the three-stage progressive type to afford easy riding under variable passenger loads. Riding comfort is further enhanced by the use of deep-cushioned seats covered with genuine leather. The 12-passenger vehicle has seats of the individual chair type, set at an angle to the body sides. The 16-passenger parlor car provides four double seats along the left side of the body and four single seats to the right of the central aisle. In addition, four individual seats extend across the width of the coach at the rear, one of the latter being removable to provide passage through the emergency rear door. Seat frames are constructed of tubular steel with hardwood bases, the whole being covered with fiber wicker and detachable genuine leather slip cover. Seats in the street car are likewise upholstered in genuine leather with deep spring cushions and spring backs.

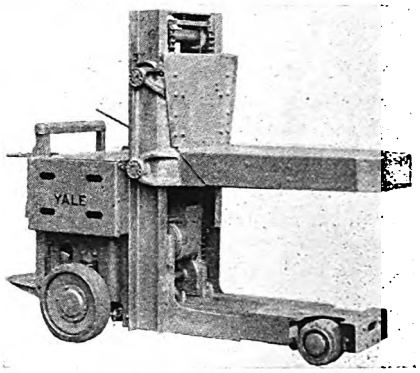


Twenty-one passenger street car body on Graham chassis powered with six-cylinder engine

High-Lift 3-Ton Truck

FOR the purpose of meeting increased load requirements, a new elevating truck has been added to its line by the Yale & Towne Manufacturing Company, Stamford, Conn. The framework consists of a large gusset plate, ½ in. thick, extending from the forward end to the small trailing wheels. This plate is approximately 24 in. high at the driving wheel axle, and in addition to forming the framework it provides a yoke to serve as a guide for the drive unit and the spring suspension of the truck. The upright channels which serve as platform roller guides are attached to this gusset plate.

The elevating platform is raised and lowered by means of a 1½-in. diamond roller chain passing over a power-driven sprocket at the bottom and an idler sprocket at the top. To reduce friction Hyatt heavy-duty roller bearings are used in the idler sprocket at the top of the machine. The shifts of the lower sheaves run in a bath of oil, which also serves to lubricate the spur gear reduction units. The two ends of the roller chain are attached to the platform through a spring take-up device which will adjust itself automatically as the chain wears.



New type of 3-ton high-lift truck

The hoisting motor is connected to the spur gear pinion through a spring ratchet so arranged that a positive drive is obtained when raising the elevating platform. If, however, the platform is checked in its downward travel the ratchet releases.

The elevating platform is supported in the horizontal position by four rollers bearing on the inside of the flanges of the vertical ship channels. Platform members are heavy steel castings with large diameter bosses to support the platform roller pins. By placing the elevating unit between the vertical roller channels all of the available space is utilized. The main drive unit is of the double reduction spur gear type, driving the wheels through totally inclosed universal joints. The entire gear reduction, with its differential and bearings, runs in a bath of oil.

A four-wheel steering feature allows a turning radius of 96 in. to the outside edge of the truck. By omitting braces it is possible to leave the top of the battery box clear and permit servicing or watering of the battery without sliding it out. The battery itself may be removed by hoisting it from the battery box or by removing the side plates of the box and sliding the battery out sideways.

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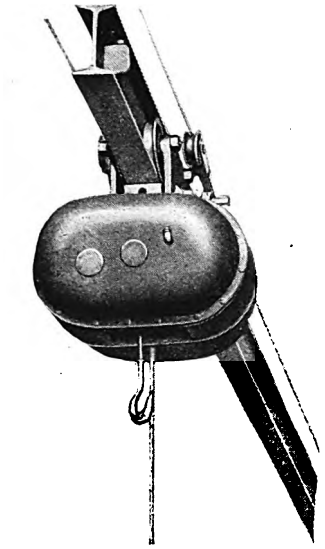
Hoist with Pressed Steel Frame

QUARTER-TON all-steel electric hoists at a moderate price are announced by the American Engineering Company, Philadelphia, Pa. This hoist is of the high-speed type with pressed steel frame, chrome-manganese steel in gears and shafts, ball-bearings, non-spinning hoisting rope, oil-bath lubrication, push-button control and upper and lower limit fixtures. All working parts are fully inclosed.



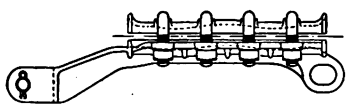
All working parts of this hoist are fully inclosed

The hoist weighs 200 lb. and is made with either plain trolley or hook suspension. The plain trolley type requires 16-in. and the hook suspension 18-in. headroom.

Dead End Assembly and Strain Clamp

FEEDERS of any size from 500,000 to 1,000,000 circ.mils can be used with the dead end assembly for low-voltage feeder cable recently announced by the Ohio Brass Company, Mansfield, Ohio. Its design is such that when dead-ending heavy feeders at a corner with this device it is not necessary to strip the insulation back, pass the cable through the insulator and serve individual strands, which wastes from 6 to 8 ft. of wire, or about 25 lb. of copper.

New dead end assembly



New strain clamp

Interlocked wet ware porcelain gives double insulation. The device has a high strength factor, all metal parts being of galvanized Flecto iron, and is so compact that ladders are not required for its installation in the overhead system.

A strain clamp has also been put on the market by the same manufacturer which permits turning corners on two or more poles without cutting or dead-ending the feeders in both directions. It is designed so that the feeder can carry straight through without any contact with the insulator assembly.

Dick Prescott Has Callers

And Gets a Surprise

WHEN Dick Prescott, young assistant superintendent of the Consolidated Railway & Light Company's shop, saw the noon hour approach his uneasiness increased. He could not quite understand the dissatisfaction which had developed in the truck shop and he wondered whether or not the men would send a committee to his office, as he had invited them to do.

In the meantime, we left Shorty Green, the ringleader of the malcontents, approaching big Pete Thompson, who had led the men back to work when Shorty failed to step out of the crowd on Dick Prescott's challenge earlier in the morning.

"Say, Thompson," said Shorty as he approached the big fellow, I've been doin' some thinkin'."

"What's the matter now?" growled big Pete, obviously not overjoyed at the sight of his visitor. "If some of you guys would do more work and less grouchin' around things in this shop would be better for all of us. I got a wife and kid at home and I ain't interested in your troubles or that bum Welcher either!"

"All right, Thompson, don't get huffy now. I was thinkin' about that committee the boss wanted this mornin'. You'd be a good guy to talk to him."

"Oh, you're tryin' to hand me the bag, are you? Well, there's nothin' doin'. You guys started a fuss just to be doin' somethin' else than workin'. You can't drag me into it no more. First thing you know some of you birds are goin' to land outside this shop on your ear."

"Wait a minute now and listen," pleaded Shorty Green. "I'm just beginnin' to wake up to what a jackass I've been. I ain't got nothin' agin' Prescott at all. Pete Welcher is the guy what's been doin' all the talkin' about Prescott bein' a four-flusher."

"Sour grapes, that's all that is," exclaimed Thompson impatiently.

"I think you're right," was Shorty's surprising answer. "I've just begun to get hep to that myself."

"Why don't you tell that to the boss, then?" demanded Pete.

"I will, Thompson, if you'll go along."

"You're on! No monkey shines, though. You give the boss the whole works and tell him there ain't nothin' wrong in this shop except that bum Welcher."

Shorty and Pete talked a minute or two longer. They decided to get the men together as soon as the noon whistle blew to tell them what they proposed to do.

At a quarter past twelve every man in the shop had voted to demand the resignation of Pete Welcher, the plotting inspector. Green and Thompson were delegated to transmit their wishes to Dick.

In a few minutes the surprised and relieved young executive was listening with amazement to Shorty Green's story, while big Pete Thompson sat silently by with his cap in his hand.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—12

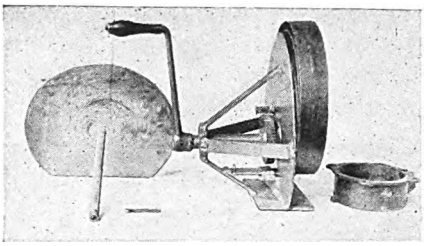
Machine Assists in Removal and Replacing of Trolley Retriever Springs*

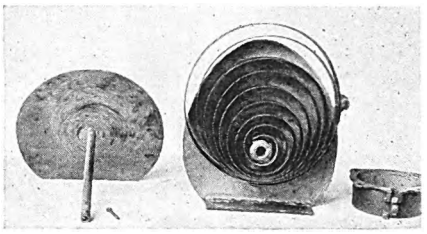
By A. F. Rexroth
Master Mechanic Harrisburg Railways
Harrisburg, Pa.

WHEN trolley retriever springs break at the eye in the end of the spring, they are reclaimed in the shops of the Harrisburg Railways, Harrisburg, Pa., by drawing the temper at the spot with a welding torch and punching a new eye. The spring is then as good as new.

In order to assist in the removal and replacing of springs a machine has been constructed as illustrated. The spring is placed on this machine and is wound tight and then is held in position by a ratchet on the shaft. The spring can be taken out by removing the back plate and can then be placed in a retriever or held tightly by a clamp placed over the spring when it is to be stored for future use. The spring is released from the machine by lifting the ratchet and turning the handle to the left.

This machine has been of particular assistance in making repairs as it eliminates the danger from handling these strong springs. It is used in both removal and replacement of the springs and is a great time saver for this work.





Above, machine developed for removing and replacing trolley springs. Below, details of the machine

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—10

Smooth Pavement with Little Money*

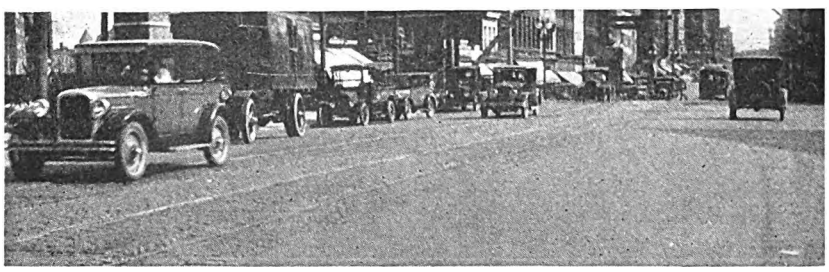
By H. E. Bean
Engineer Way and Structures New York State Railways, Syracuse, N. Y.

SMOOTH pavements in car tracks add nothing directly to the revenue of the operating company, but public demand requires a higher degree of maintenance each year and frequently this results in repaving ordinances where many years of life still exist in the track structure. The use of hot tar or asphalt with crushed stone has been found to answer the demand at a comparatively small expense.

The Syracuse lines of the New York State Railways have more than 400,000 square yards of pavement, mostly brick or medium block. Each spring every line is covered by a repair gang of six men with two trucks. One is used for the coarse aggregate and the second for screenings and sand and to tow the tar tank. All depressions, faulty places, cuts or surface removals are patched and the general paving repairs completed by this means. Miscellaneous failures that develop around special work, etc., are repaired with small quantities of material hauled on a light truck.

In making patches, the hot tar, known as "Binder T" New York State Highway Department, is applied to the cleaned surface with sprinkling pots having slotted openings. Depressions are filled with No. 1 or No. 2 stone, according to depth, and more tar is applied to the stone. Screenings mixed with sand are thrown over the top to seal the patch and prevent automobile tires from picking up the tar. Patches may be run to feather edges and under traffic soon resemble asphalt. Proper temperature in tank is maintained by a kerosene burner in the firepot.

The local cost of tar at 10 cents per gallon and crushed stone at $1.50 per ton make a cost, including labor and truck charges, of approximately 50 cents per square yard. The advantages of this construction are speedy repairs, economy, decreased minor claims, less complaint and enhanced public relations.



Tracks in Syracuse, where pavements are kept in smooth condition

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

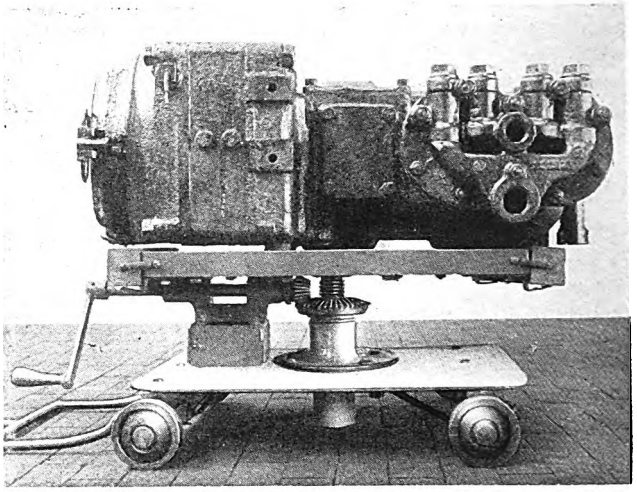
ROLLING STOCK—MISCELLANEOUS—13

Convenient Type of Compressor Truck*

By G. R. Fanning
Foreman Pneumatic Section, Hillcrest Shops,
Toronto Transportation Commission, Toronto, Canada

FOR the installation or removal from cars of air compressors, a small truck with roller bearing wheels has been made in the shops of the Toronto Transportation Commission. The body of the truck is a steel plate 5½ in. from the floor; on this is mounted a pedestal 4½ in. high with a 1¾-in. bore which acts as a support and guide for the 1¾-in. screw on which a turntable is fastened. This, in turn, supports the compressor.

The screw has four threads per inch and is operated by a crown gear and pinion, the crown gear turning on ball bearings. The table is raised or lowered by turning a handle at the front of the truck. This truck has reduced the time required to mount a compressor under a car very considerably, and when raised up the truck can be moved easily to the exact position to receive the compressor or to place it back under the car. Also, after a compressor has been removed from a car, it can be taken to the vacuum cleaner or sent to the repair department without any extra handling.



Truck for removing and installing air compressors under cars

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—11

Machine for Oiling Track Curves*

By I. O. Mall
Assistant Superintendent of Roadway New Orleans Public Service, Inc.
New Orleans, La.

TO PROVIDE a thorough and efficient means of oiling track curves, the machine illustrated was developed by the New Orleans Public Service, Inc. An airtight oil receptacle is mounted on two wheels and has a pipe extension arm. Air at a pressure of about 20 lb. is supplied to the oil by means of a hand pump attached to the handle. A flexible connection is provided from the pump to the top of the oil receptacle and a valve mechanism at the bottom for regulating the flow of oil is controlled by levers on the handle.

Three men with three of these machines are doing the work formerly requiring nine men, and results in a net saving of $3,500 per year. A uniform and continuous film of oil is placed on the guard rail where it is most effective, and the flexible control provided through the air pressure and the operator's control permits uniform lubrication irrespective of temperature conditions which affect the viscosity of the oil.

Due to the simple means of control, accident hazards are reduced, since the operator can give complete attention to traffic movement.

Track curve oiling machine

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

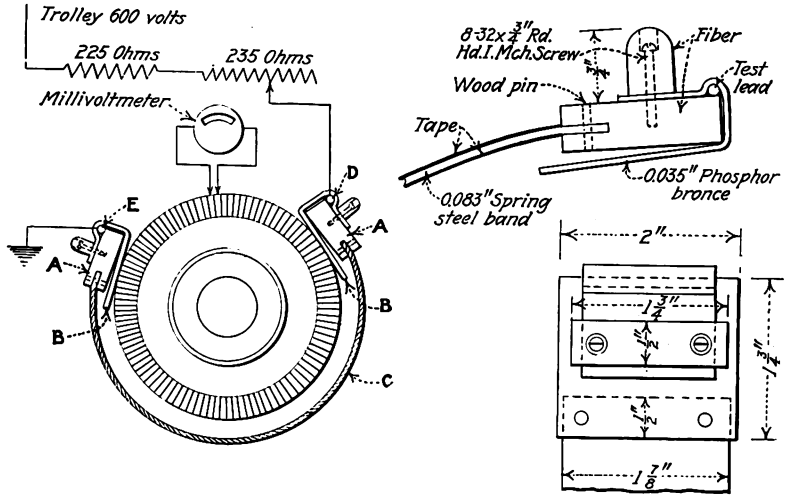
ROLLING STOCK—ELECTRICAL—23

Self-Adjusting Yoke for Bar-to-Bar Test*

By Arthur E. Clegg
Foreman Electrical Department,
San Diego Electric Railway, San Diego, Cal.

FOR testing armatures by the bar-to-bar method a self-adjusting yoke is used in the electrical department of the San Diego Electric Railway, San Diego, Cal. The accompanying illustration shows the yoke as used with a commutator having 35 bars between contacts.

Two white fiber pieces, marked *A* in the illustration, support the spring contacts and form a base for attaching the leads through which the series current flows. The spring contacts, *B*, have sufficient spring action to insure proper contact. The fiber pieces are fastened to a spring steel band designated as *C*. This band is insulated with oil linen and friction tape and holds the contacts securely on the commutator bars. For various types of commutators having different numbers of bars the steel band is changed. This testing yoke is connected in the series circuit by leads, *D* and *E*, with two steps of resistance, the last step being variable to give different values of current and provide a convenient deflection on the millivoltmeter. The source of power is 600 volts. With this arrangement an armature can be given a bar-to-bar test without removing it from the frame by taking out the brush-holders and placing the yoke around the commutator.



Self-adjusting yoke for armature bar-to-bar test

*Submitted in Electric Railway Journal *Prize Contest*.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—11

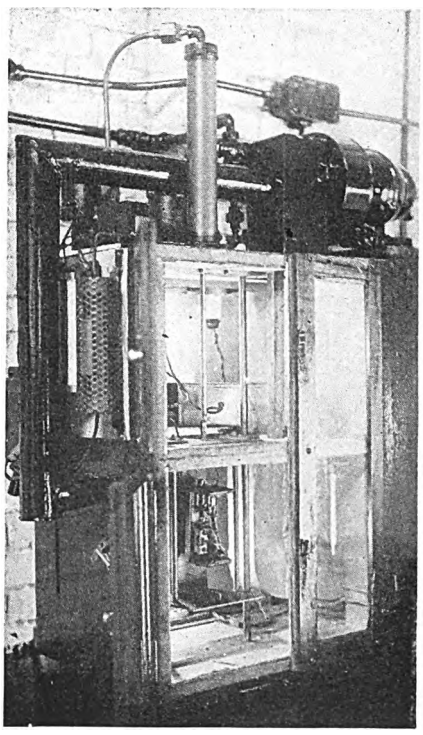
Testing and Regulating of Thermostats Made Easy*

By Harvey L. Bullock
North Station, New York Central Railroad,
White Plains, N. Y.

REGULATION of thermostats used in multiple-unit cars of the electric division of the New York Central Railroad is done in a test cabinet that has been constructed by the shop forces at North White Plains, N. Y. This duplicates the conditions of heat and cold which occur in a car and furnishes an easy and accurate means for testing and adjusting these thermostats.

The test cabinet has two chambers, one above the other, each containing about 8 cu.ft. of air. The two are insulated from each other and are provided with glass doors so that the interior is visible from the outside. The chambers are provided with two 100-watt lamps for heating, and the lower chamber is kept cool by an electrically driven refrigerating machine, the Icemaster, which uses methyl chloride as the refrigerating agent. The pumps and condensing coils of the Icemaster are located on a shelf some distance from the cabinet.

An elevator connects the two chambers of the cabinet. The thermostat to be tested is placed on this and connections are made so that the lower temperature contacts of the thermostat will send the elevator up into the warm chamber and the high temperature contact will operate to return the elevator to the lower chamber promptly. The temperature in each chamber can be adjusted to any given value desired within reasonable limits. The elevator runs on



Test cabinet for the regulating and testing of thermostats

*Submitted in Electric Railway Journal *Prize Contest*.

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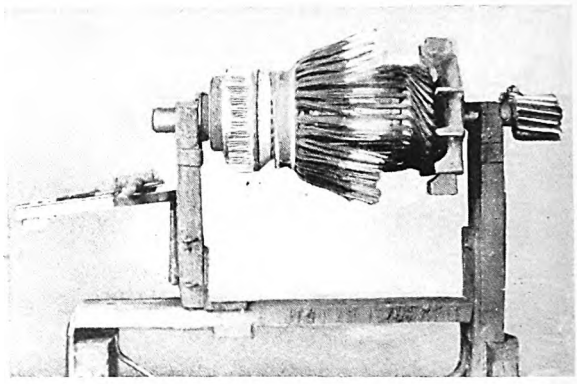
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—24

Adjustable Armature Stand*

By M. S. Walker
Armature Winder Beaver Valley Traction Company, New Brunswick, Pa.

AN ADJUSTABLE armature stand that does away with old time stands has been devised by the mechanical department of the Beaver Valley Traction Company. With the several attachments used all armatures are wound speedily. In the construction of this stand two 3 in. x 6 in. x 24 in. long channels are spaced 34 in. apart and imbedded in concrete. A piece of ¼ in. x 4 in. channel iron, with a ¾ in. slot 18 in. long in the center is placed on top of the 3 in. x 6 in. channels. Then two uprights of 2 in. x 5 in. are cut out. The back one of these is bolted securely to the channel iron. The other is the upright for the front end and has a piece of angle iron ½ in. x 3½ in. x 5 in. with a ⅝ in. hole drilled in the center. To keep this upright from moving sideways on the channel iron the bottom of the angle that slides on the channel is slotted ⅛ in. deep and a piece of iron 1 in. x 3 in. x 4½ in., with a hole drilled in the center and tapped out, is placed under the channel. The front upright is on top of the channel and can be adjusted for any size armature.



Handy type of adjustable armature stand

By use of an extra attachment air compressor armatures can be held in this stand while being wound. The attachment consists of an old DH-16 compressor bearing with the threads turned on the outside. This is put on the standard and the compressor armature of short length is placed on it.

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—11

Testing and Regulating Thermostats Made Easy*—Continued

two guide rods and is provided with two sealing plates at the top and bottom so that when it reaches the limit of its travel in either direction, both chambers are sealed from each other. The elevator is electro-pneumatically operated by two solenoid valves which control the action of a compressed air supply in a cylinder, the piston of which moves the car up and down. To facilitate rapid change of temperature there is an exhaust fan located at the top of the cabinet and a damper control enables the operator to exhaust either chamber at will.

By regulating the temperature of the room to the required degree and by observing the response of the thermostatically controlled elevator, a graphic and sensitive method of observing the speed and accuracy with which a thermostat responds to prearranged temperature limits is provided. In addition, the operation of the elevator through the rapid alteration in temperature forms a convenient method for testing the thermostat contacts a large number of times and thus assures proper operation in service.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—7

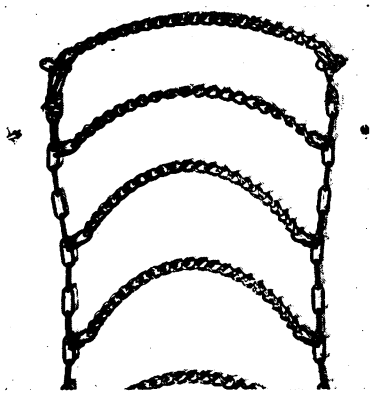
Single-Type Tire Chains Reduce Labor of Application*

By D. S. Mackay
Supervisor of Automotive Equipment
Boston Elevated Railway, Boston, Mass.

During past winters physical difficulty has been experienced by the Boston Elevated Railway with buses operated with snow chains. To reduce the amount of labor necessary in applying, a single chain is used for 36 x 6 tires. These have snow links made of $\frac{7}{32}$-in. stock, cross links 1½ in. x 1 in. x $\frac{9}{32}$ in. with full half twist, a hook ¼ in. diameter and a locking device of $\frac{3}{16}$-in. material.

This type of chain provides a perfect fit and the full half twist links laid flat when in contact with the roadbed reduce breakage. The life of the single-type chain is much greater than the dual chain previously used.

With the single chain it is unnecessary to jack up the rear end of a bus when it is applied and two buses can be equipped with single chains in the time that originally was taken for applying them to one bus. When applied to outside wheels, damage to brake rods, Alemite fittings, fenders and paint are eliminated. The mileage obtained per gallon of gasoline is also increased. The accompanying illustration shows the type of chain used.



Single chain used on tires of the Boston Elevated Railway buses

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

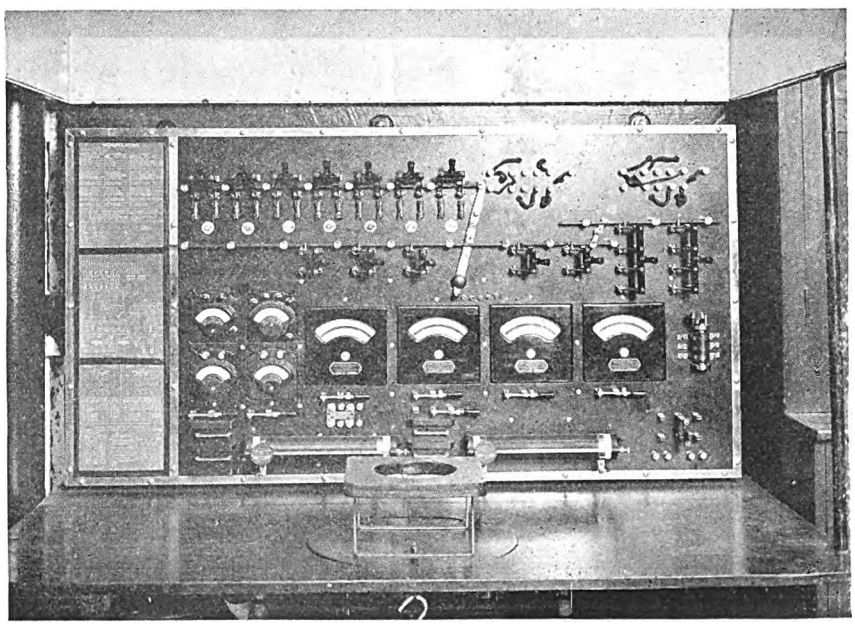
SIGNALS—2

Board for Testing Signal Apparatus*

By W. R. Hornberger
Elevated Signal Department, Philadelphia Rapid Transit Company, Philadelphia, Pa.

Signal apparatus repaired in the shops of the Philadelphia Rapid Transit Company and in use on the subways and elevated lines is tested at a board designed and built by the shop forces. The variety of apparatus to be tested necessitates the use of three different values of current and seven different voltages. A corresponding variety of instruments is necessary. Weston instruments are used and include one 0-25 voltmeter, one 0-1 ammeter, one 0-50 milliammeter, one a.c. model 330 four-scale voltmeter, four a.c. model 155 ammeters.

The board is designed to facilitate the test for manipulation of switches, avoiding all necessary setups to prevent conflicting connections. A unique system of interlocking is provided which prevents mistakes and damage to instruments.



Signal test board used in shops of Philadelphia Rapid Transit Company

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

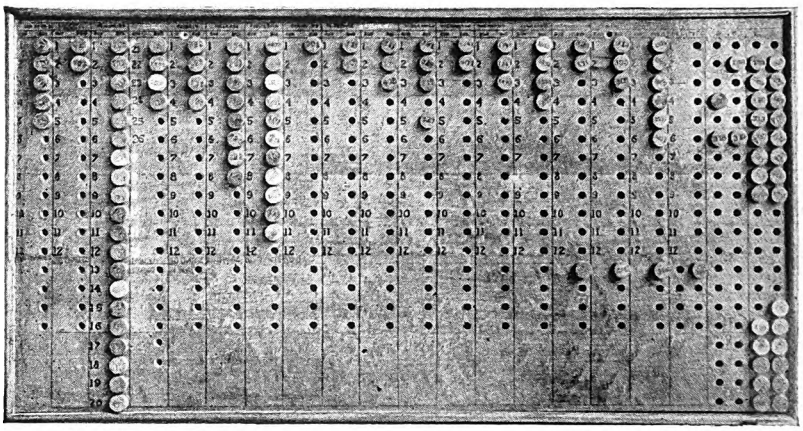
BUSES AND TRUCKS—8

Plug Board Shows Location of Buses at All Times*

By C. B. Lindsey
Superintendent of Automotive Equipment
Los Angeles Railway, Los Angeles, Cal.

GREAT assistance has been given by the plug board shown in the accompanying illustration, which was made by the engineering department of the Los Angeles Railway. It is used to show the locations of buses at all times. The clerks at the bus garage find its use indispenable in keeping track of the buses.

A plug is provided for each bus, which is numbered accordingly. When a bus is in service the corresponding plug is placed opposite the train run number on the line to which the bus is assigned. The board is divided into columns, a separate column being provided for each line. Buses on hand are kept in the column to the right of the board and are moved to the "O. K." column as they are inspected and reported in good order by the foreman. In this way the number of extra buses can be determined at a glance.



Type of bus plug boards used by the Los Angeles Railway

When trippers go out or replacements are made the plugs are moved accordingly, thus avoiding confusion and making it possible to locate any bus immediately.

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

SIGNALS—2

Board for Testing Signal Apparatus*—Continued

Taps in the upper right-hand corner of the board are connected with air-cooled transformers used in conjunction with the 250-volt, 25-cycle and 110-volt, 60-cycle supplies to provide the lower voltages. Direct current is obtained from a battery line. Fine variation in voltage is obtained by the use of two variable resistance units connected as potentiometers.

Both a.c. and d.c. buses are provided for testing at the board. These may be connected through interlocking switches to the electro-pneumatic tester. A miniature interlocking machine roller on the board controls the electro-pneumatic switch valves under test.

Interlocking of switches is accomplished by using sliding Bakelite bars placed to intercept the blades of conflicting switches and prevent closing. Six positions on the bars are provided, slots cut in them allowing the proper switches to be closed for each position. On switches mounted horizontally the bar intercepts a pin fastened to the blade. The lever controlling the bar also acts as a switch with six taps connecting the proper voltmeter across the buses.

Stands to accommodate the several types of relays may be mounted on a turntable, which may also be inclined to facilitate work. The turntable is on the bench directly below the board. The cover for the board, lined with white enamel, serves as a reflector for lamps mounted within the cover, thus providing indirect lighting when in a raised position. When lowered it protects the board and apparatus from dust.

*Submitted in Electric Railway Journal Prize Contest.

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American Association News

Utilities Commissioners Consider Vital Subjects

Valuation, improvement of service, motor bus regulation, insurance and electric railway progress have attention at Dallas meeting

REPRESENTATIVES of regulatory commissions of 38 states attended the 39th annual convention of the National Association of Railroad and Utilities Commissioners, meeting during this past week from Oct. 17 to 21 in Dallas, Tex. Reports of committees and addresses covering a wide range of problems connected with the equitable regulation of public service companies occupied the attention of the convention. Among these were a number of subjects of direct interest to electric railway men. A report of the committee on valuation presented by Hon. Fred Woodruff of Iowa was followed by an address on this subject by Hon. W. A. Prendergast of the New York Public Service Commission, who stressed the need for agreement on an economically sound basis of determining utility values. He urged that regulatory bodies assume the responsibility for initiating and promulgating a sound and uniform basis of determining fair value, instead of leaving this important subject to legislative determination where, he said, it would be approached not on an economic, but on a political basis.

W. W. Atterbury, president Pennsylvania Railroad, called attention to the vast expenditures being made by the railroads of the country for the improvement of service. This progressive policy, he declared, can be continued only if the public will maintain fair treatment and permit a fair return for the capital being thus expended for the public service.

Motor Vehicle Situation Considered

Motor vehicle common carriers came in for consideration in the report of the committee on motor vehicle transportation presented by Hon. Amos A. Betts of Arizona. The report outlined the rapid growth of this new form of transportation and urged the need for adequate regulation that would protect the investments of responsible operators and the interests of the public. Hon. J. E. Benton, general solicitor of the association, outlined the status of the matter of federal legislation of interstate buses. Action on this subject, he said, is awaiting the completion of the report being prepared by the Interstate Commerce Commission based on its study of the problem of motor transportation throughout the country. When the Interstate Commerce Commission's study is completed, Mr. Benton predicted, the representatives of the state commissions expect to co-operate with that body in the final recommendation of the principles upon which interstate vehicle regulation should be based.

S. A. Markel, representing the Motor Bus Division of the American Automobile Association, expressed the views of his organization on this subject. He said that bus operators are in favor of the regulation of interstate passenger carriers, but favor the elimination of trucks from proposed legislation. This regulation, they maintain, should be delegated through federal authority to the respective states. Mr. Markel added that the next step in handling the motor bus problem would then be to secure uniform regulatory laws in the various states.

Another phase of the motor bus question, that of sound insurance, was discussed in an address by H. S. Ives, vice-president Casualty Information Clearing House, Chicago. Contrary to the general impression among bus operators, according to Mr. Ives, insurance rates on buses are fixed by the operators themselves through the accident record which they establish. The speaker decried the tendency on the part of some bus men who object to the present excessive high rates of insurance, to urge assumption of insurance activity by the state, and held that any step in the direction of government insurance is a blow at the entire business and industrial structure of the nation.

Lucius S. Storrs, managing director of the American Electric Railway Association, addressed the convention on the status of the electric railway industry. He called attention to the significance of the recent Cleveland convention in demonstrating the rapid progress which the electric railways of the country are making in meeting present-day transportation needs. Electric railways, said Mr. Storrs, are keenly alert to their responsibilities to the public, and are exerting their utmost effort toward the improvement of service and co-operation with local and state regulatory bodies. To carry out their objectives and their proper place in the life of the modern American community, however, they must be granted rates of fare which will produce a fair return on the capital invested in this basic industry. That there is a growing tendency on the part of the public to recognize the needs of electric railways is evidenced, according to Mr. Storrs, by the gradual rise in electric railway fares. He held that a maximum fare of 10 cents is entirely justified for electric railway service and cited that this rate is in effect in 214 cities of the 313 having a population of 25,000 and over.

Other committee reports of interest to electric railways included the work of the committee on statistics and accounts of railroad companies, public ownership and operation, uniform regulatory laws, statistics and accounts of public utility companies, and the report of the committee on public relations.

Mr. Wells Chosen President

The association elected as its officers for the ensuing year: H. G. Wells of Massachusetts, president; L. E. Gettle of Wisconsin, first vice-president; Charles Webster of Iowa, second vice-president. It also re-elected J. B. Walker of New York as secretary; J. E. Benton of Washington, general solicitor, and C. S. Bailey, Washington, assistant secretary.

Glacier National Park in Montana was selected for the next annual meeting, to be held on Sept. 10, 1928.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Oct. 26-27*—Public Utilities Association of West Virginia, annual convention, Parkersburg, W. Va.**

***Oct. 26-27*—Society Automotive Engineers, Transportation Section meeting, Hotel Sherman, Chicago, Ill.**

***Nov. 2-3*—Iowa Electric Railway Association, operating and maintenance sections, annual convention, Blackhawk Hotel, Davenport, Iowa.**

***Nov. 4*—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 33 West 39th Street, New York, N. Y.**

***Nov. 4*—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York City.**

Central Traffic Men to Meet Nov. 16-17

FORT WAYNE, IND., has been selected for the next meeting of the Central Electric Traffic Association, which will meet at the Keenan Hotel on Nov. 16 and 17. The first day's session will be called to order at 9 a.m., Central time.

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U. S. Chamber of Commerce Has Four-Day Meeting

PURSUANT to a new plan, about 400 members of the U. S. Chamber of Commerce met at West Baden, Ind., over last week-end for a four-day meeting, packed with the sessions of committees, councillors and members of the board of directors. The sessions closed Oct. 18. Of first importance were reports on Mississippi flood control, tax reduction and a new civic objective for business. Additional subjects covered in general meetings were a project for getting out the vote at elections, reduction of postal rates, maintenance of the integrity of the Federal Reserve System, self-regulation by business, the part played by member organizations in legislation, and the relation of these organizations to the public and the press. Twenty different committees held meetings, reviewed the progress of their work, and, where advisable, laid out new plans. As always at U. S. Chamber of Commerce meetings the attendance included a large number of the leaders of American business, both from industry and trade. General judgment was that this new plan of grouped committee and national councillors meetings was a success, enabling all groups sharing in the chamber's work materially to advance their activities.

Mississippi flood control was presented through addresses by Lewis E. Pierson, president of the chamber; John M. Parker, former Governor of Louisiana, and through a report of the chamber's flood committee, headed by Frederic A. Delano. The report was ordered to be made the basis for referendum to chamber members. It recommends "(1) that the federal government should hereafter pay the entire cost of constructing and maintaining the works necessary to control the floods of the lower Mississippi; that is, from Cairo to the Gulf; (2) that the federal government should assume the sole responsibility for locating, constructing and maintaining such works; (3) that there should be an adequate appropriation to insure efficient, continuous and economic work, the funds to be made available as needed; (4) that flood control on the Mississippi is a work of such magnitude and urgency that it should be dealt with in legislation and administration upon its own merits, separate and distinct from any other undertaking."

In tax reduction the chamber is now asking member organizations to vote on a suggestion that the corporation income tax be reduced from 13½ per cent as now to 10 per cent. The chamber's committee, as already announced, asks a total tax reduction of $400,000,000. Reductions advocated include the abolition of the federal inheritance tax and excise taxes imposed as war measures.

The committee on postal service advocated the elimination of the higher rates made effective in 1925 on private mailing cards and circular matter, and also war rates on advertising in magazines and newspapers. This committee showed that the Post Office Department has lost revenue through these increases and that the existing rates are handicapping business.

Harry A. Wheeler, president of the Union Trust Company, Chicago, discussed the benefits of the Federal Reserve System and urged strong defense of the system by business. Improvements are to be expected by fundamentals should not be altered.

Judge Edwin B. Parker, chairman of the board of directors of the chamber, advocated regulation of business by itself, asserting that if it does not do so the government will. He commended the helpful attitude of the Federal Trade Commission in desiring to assist business to work out rules of business conduct in the interest of business itself, but in a manner to safeguard the interests of the general public.

In closing the session, President Pierson pointed out that the national councillors present had a grave responsibility, for on them rested the task of taking back to their organizations the problems studied by the chamber and there creating that informed public opinion which will bring its influence to bear on government for the common welfare.

American Association News

Side Wear on Brushes in Ventilated Motors

THE following report of special committee No. 8, Rolling Stock Division A.E.R.E.A., was received too late for publication in the report number of ELECTRIC RAILWAY JOURNAL.

Observations are being made on a number of railway properties to determine the effect on brush life of changes made in ventilated railway motors. Various schemes of ventilation have been worked out and data are being collected on these motors to find a means of obtaining increased life of the carbon brush without increasing commutator wear.

Side wear of carbon brushes was known before the advent of the ventilated railway motor. In such instances where it occurred in the totally inclosed motor it was no doubt due to high current density in the brushes, the erosion of the sides of the brush being caused by incipient sparking from brush to carbon box. In such instances the pigtailing of the brush was beneficial. Side wear of brushes has not been a serious factor in the series ventilated railway motor, this no doubt being due to the fact that the air enters the motor at a low velocity and not very large volume and the intake is at the pinion end.

With the development of the multiple ventilated railway motor, where the air enters at the commutator end, one stream of air passing across the field coils and the outside of the armature and the other stream of air flowing through the armature, it has been found that the life of the carbon brush has been materially shortened. It was quite some time before it was definitely determined that the side wear of brushes was caused by dust, which, entering with the ventilating air, lodges between the carbon brush and the carbon box and, acting as an abrasive, causes side wear of the brush and roughens the brush surface of the carbon box.

There may be instances where side wear of brushes in multiple ventilated motors is due to methods of taking current from the brush, causing sparking as referred to above in reference to the totally inclosed motors.

The following tests showed conclusively that dirt was the cause of side wear of brushes:

On a four-motor, 35-hp. equipment where side wear of brushes was very bad, the fourth motor on a car was cut out of the electrical circuit, new brushes placed in all four motors and the car put back in service operating on three motors. An inspection weeks later showed that the brushes in No. 4 motor had just as much side wear as the brushes in either of the other motors.

Another test was made by insulating the carbon box from the brush-holder, body current being taken from the brush by means of a pigtail and also through the brush-holder pressure arm. Results of tests showed that brushes in the special insulated carbon boxes had just as much side wear as did the brushes in the standard holders. Tests have shown that if movement of the brush in the carbon box can be eliminated or dust kept out of the motors, side wear of brushes will be negligible.

Inclosed brush-holders have been very effective in reducing the side wear of brushes; the objection to this construction is on account of additional maintenance of the covers, also on account of difficulty of inspection.

During the past two or three years manufacturing companies have made very extensive tests both in service and on the test stand to find some means of obtaining better brush life, and results in service indicate an increase of from two to ten times the life previously obtained.

Operators endeavoring to improve brush mileage should be careful not to do so at the expense of their commutators. Of first importance is the selection of a brush that will polish the commutator, thereby reducing the number of broken brushes and the flashing over of motors. A brush that does not polish but etches and roughens the commutator will not ride smoothly and will be bounced from the commutator when the car, traveling at high speed, hits special work or raised rail joints, resulting in flashing over of commutators.

The proper spring pressure on the brush is a prime requisite to successful performance of the motor and this value is dependent on the condition of track, speeds operated and the weight of the equipment.

The brush-holder spring pressure should be maintained so as to keep the brush on the commutator at all times.

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News of the Industry

Grand Rapids Rejoices in Coffin Award

Grand Rapids, Mich., was given an opportunity on Oct. 13 to show its appreciation of the honor conferred on it by the recent awarding of the Charles A. Coffin Prize to the Grand Rapids Railroad. The occasion was a dinner given by Clay H. Hollister, president of the Old National Bank, at the Hotel Pantlind, and the honor guests were Louis J. DeLamarter, vice-president and general manager, and his associates of the winning company.

Mr. Hollister lauded the rehabilitation of the local lines, which he termed the greatest contribution toward putting the railway systems of the country back in the category of staple utilities. Attorney Stuart E. Knappen described the difficulties of securing a rise in fares and of working out the present franchise terms following the critical postwar period. That Mr. DeLamarter was able to obtain the co-operation of the city administration and the general public in the face of such handicaps was termed an achievement of exceptional merit. In reviewing the history of the organization Mayor Swarthout expressed his joy that the city and railway were able to combine their efforts to bring about such desirable results.

General Manager DeLamarter in expressing his appreciation eulogized the city government, newspapers and the public in bringing about a better understanding of what the city transportation lines were doing. He disclaimed all personal credit for the award, giving the credit to his workers in the field.

The reasons back of the astounding success of this comparatively small railway serving a population of approximately 160,000 were enumerated in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 15, 1927, pages 728 to 738.

Boston Employees Charge Discrimination in Wage Settlement

Nine employees of the Boston Elevated Railway, Boston, Mass., all members of the Amalgamated Association, have brought suit against the company in the Superior Court claiming they were discriminated against in the recent wage increase granted by the Boston Elevated Railway. The men, who are variously employed as truck drivers, air compressor men, track operators, stablemen and teamsters, have asked in a bill in equity that the railway and officials of the union be enjoined from putting into effect a new wage scale and hour schedule.

The nine employees claim executives were influenced in leaving them out of consideration through pressure brought to bear by the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers, and the International Union of Steam Operating Engineers. These two organizations, it is claimed, sought to bring their various positions under the control of the two orders.

The Boston Elevated Railway is said to be willing to include the nine men in the new contract, but intends to enter into a contract with the other two unions. The men say they will be unable to get work elsewhere without joining the two unions named, and are anxious to have the benefits of the Amalgamated. They seek to void the working contract recently enacted and have it made over to include their work. The case will be heard Oct. 25.

Birthday Surprise for T. N. McCarter

On the occasion of his 60th birthday on Oct. 20 Thomas N. McCarter, president of the Public Service Corporation of New Jersey, was given a surprise party by 1,000 employees. A bouquet of American Beauty roses was presented to him by John Craig of Rutherford, N. J., who has a service of 35 years with the company.

When Mr. McCarter rose to accept the gift the chair in which he had been sitting became a luminous representation of a birthday cake, lighted with 60 electric bulbs and embellished with the seal of the Public Service Corporation.

Jitney Ordinance Constitutional

Supreme Court hands down decision eliminating jitneys from route of Detroit Street Railway. Five-year controversy ended. Municipal Railway must care for added patronage

THE United States Supreme Court dismissed the appeal of the Red Star Motor Drivers' Association to have the Detroit ordinance regulating jitneys declared unconstitutional, thus ending a five-year battle to drive the jitneys off the street. Although the formal court decision has not been received by the Detroit city officials, they were notified on Oct. 17 that the Supreme Court had held that it was without jurisdiction, no federal question being involved. The validity of the ordinance had previously been upheld by the State Supreme Court of Michigan.

It has not been announced what the city's next step will be, but it is unlikely that any action will be taken to oust the jitneys until after an official copy of the court decision has been received. Edward N. Barnard, attorney for the jitney drivers' association, stated that he would start at once to fight for a rehearing before the Supreme Court. Members of the City Council were of the opinion that the matter of ousting the jitneys from the streets of Detroit rested with Mayor John W. Smith, and decision is being withheld by the Mayor until Corporation Counsel O'Neil has had an opportunity to go over the court decision. The Mayor has announced that he will be governed by the opinion of the Corporation Counsel.

The finding of the United States Supreme Court was anticipated when the court declined to hear further arguments in the case. Additional briefs were to have been filed both by the city attorneys and attorneys for the jitney drivers. The case was advanced on the docket to first position after the city of Detroit sought its immediate dismissal early last spring.

The case was brought to the high court on a writ of error by the jitney drivers, against the decision of the Michigan Supreme Court. The Michigan Court had upheld the constitutionality of an ordinance which, in effect, would have barred the jitneys from main Detroit thoroughfares and dismissed an injunction issued in the Wayne County Circuit Court restraining the city from ousting them. While the case was pending before the United States court the State Supreme Court issued an injunction restraining the city from acting pending a final decision.

This so-called "jitney ordinance" bars jitneys from operating on Woodward, Jefferson and Grand River Avenues and on Fort Street, and proposes substitute routes which, it was cited in the brief filed in the case, are longer and involve many sharp turns. The ordinance was held unconstitutional by Wayne County Circuit Judge Ormond F. Hunt, and his decision was reversed by the State Supreme Court in a divided decision.

It was the contention of counsel for the jitney drivers' organization that the ordinance violates the Fifth and Fourteenth Amendments to the Constitution of the United States in that it causes serious discriminations and would result in confiscation of property without due process of law. It was

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further claimed that in barring jitneys from streets where buses, street cars and taxicabs were permitted to operate the ordinance became class legislation.

A survey is being made by Del A. Smith, general manager of the Detroit Department of Street Railways, to determine whether the city department has transportation facilities available at present to care for the passengers carried daily by the jitneys. It is estimated that the ousting of the jitneys will add 35,000 passengers to the Detroit street railway traffic daily and that the jitney riders will bring an additional revenue of $3,000 per day.

The first of the 125 new street cars ordered by the Department of Street Railways has arrived and others are to arrive at the rate of eight per week. It has been stated that the new cars will more than care for the additional patronage due to the proposed ousting of the jitneys and that the Detroit United Railway has offered to rent cars to the city. The new express service which was recently put in effect on Jefferson Avenue requires the use of numerous city buses and the survey is being made to determine whether more equipment would have to be purchased to handle the additional passengers now making regular use of jitneys.

The various steps in the jitney controversy in Detroit have been covered in the ELECTRIC RAILWAY JOURNAL. It was said editorially in these pages last year that the management of the municipal railway had been embarrassed beyond measure by the unrestrained jitney competition, which in 1925 mulcted the revenues of the municipal system to the extent of more than $1,000,000.

South Jersey Desires Trolley Back

Residents of several towns below Gloucester in New Jersey recently appealed to the Board of Public Utilities Commissioners of New Jersey to require the Public Service Railway to restore railway service to those towns. The company abandoned its service below Gloucester in August of this year because of the alleged unsafe condition of the bridge over Big Timber Creek. In its place a fleet of buses was substituted. It is the claim of the people that bus service is entirely inadequate.

Handy Folder Gives Milwaukee Rail and Bus Schedules

A complete time-table, effective Oct. 10, is included in the fourteen-page booklet of the Milwaukee Electric Lines, Milwaukee, Wis. It includes service schedules in force on the lines of the Milwaukee Electric Railway & Light Company, the Milwaukee Northern Railway and the Wisconsin Motor Bus Lines. In addition, some general information is included and some helpful hints for the traveler.

Comment Continues on New York's Transit Problems

Reports, findings, opinions, hearings and hearsay on New York City's transit difficulties and developments continue to receive more than a little share of public comment and publicity in the newspapers.

Some new angles to the whole story include the publication on Oct. 19 of a legal opinion, written by William D. Guthrie, president of the New York City Bar Association; Nathan L. Miller, special counsel for the Brooklyn-Manhattan Transit Corporation, and John W. Davis, former Democratic candidate for president, in collaboration with Rushmore, Bisbee & Stern, holding that the city of New York may not recapture the lines of the Brooklyn-Manhattan Transit Corporation for from eight to ten years. In answer to this, Samuel Untermyer, the Transit Commission's special counsel, decided against further conferences with the Brooklyn-Manhattan Transit Corporation until after the city has taken steps to recapture the city-owned portions of the Brooklyn-Manhattan system.

Another happening in the transit situation was the reappearance on the scene of Major Charles E. Smith of St. Louis, who a few weeks ago submitted his report on the transit survey of New York City. He announced his willingness to appear unconditionally as a witness at the Transit Commission hearing conducted by Samuel Untermyer. He supplemented his interview with Comptroller Berry by a statement which had arrived in the mail from St. Louis giving his answer to ten questions on transit problems asked by the *World* following publication of the draft of his report.

Just prior to these developments there had been the statement that the Transit Commission would proceed at once to prepare a transit readjustment plan based on the recommendations of Mr. Untermyer, and would hold public hearings as soon as possible to enable it to present the plans to the Board of Estimate and the traction companies with a minimum of delay. Following this announcement came word that Comptroller Berry had offered to ask Major Smith to return to testify before the commission in explanation of his readjustment plan report. The next point of interest was the appointment of a non-partisan advisory committee of distinguished citizens to confer with the Transit Commission, city authorities and traction companies in an effort to reach the solution of these transit problems, which was urged by the Merchants Association.

On Oct. 18, with the active support of Mayor Walker, the Board of Estimate, meeting in committee of the whole, voted to put $20,210,000 for subway construction in the 1928 budget as the first step in the plan of John H. Delaney, chairman of the Board of Transportation, to preserve the 5-cent fare in the new city subway system by paying part of its cost out of taxes, thus lessening the interest charges and making them that much nearer self-supporting at a 5-cent fare.

Ten Cents in Binghamton

A 10-cent cash fare, four tickets for 30 cents on its two operating zones known as the City and the Endicott zones, were allowed the Binghamton Railway, Binghamton, N. Y., in an order of the Public Service Commission dated Oct. 7. The receiver, William H. Riley, was authorized to put the desired rates into effect on Oct. 16 and to continue them until June 30, 1929, and thereafter until otherwise ordered. Sale of tokens on all cars in each zone was included in the order. The Binghamton Railway now charges a 7-cent fare in each zone.

The commission's decision fixed the value of the property of the railway upon which it was entitled to a return at $3,000,000, and the rate of return to the company indicated under the new fare rates will be 8 per cent.

The Binghamton line has been in the hands of a receiver since 1918 except from Feb. 23, 1924, to Oct. 25, 1925. In 1919 the company asked for a 6-cent fare. After controversies with the city over franchise conditions this was allowed until Jan. 12, 1925, when the company, the receiver having been temporarily discharged, asked for a 7-cent fare with a 10-cent fare between Johnson City and Endicott and a round trip fare of 15 cents. The city again waived any franchise conditions and the commission authorized a 7-cent fare. Notwithstanding the increase, the company again went into a receivership on Oct. 11, 1925.

When Receiver Riley asked for the 10-cent cash fare, the city protested the jurisdiction of the commission. The city secured a writ restraining the commission from acting upon the receiver's application during the proceedings in the Supreme Court which were terminated recently when the Court of Appeals held that the Public Service Commission had jurisdiction.

Suggestions Invited Through Portland Press

In each of the four daily newspapers of Portland, Ore., namely the *Oregonian*, *Journal*, *News* and *Telegram*, display advertisements will appear each week for a period of three months dealing with modern transportation in that city. The purpose of the Portland Electric Power Company in placing these advertisements is to invite its patrons to read and study the messages, and from the information to know something of the various phases of modern transportation service, both electric railway and bus. The company is inviting suggestions, and it is through this medium it hopes to win the frank and honest opinion about important questions. Constructive criticisms which can be practically applied will help the company and give the traveling public better service.

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City Ownership in Chicago a Possibility in New Lisman Offer

A revised plan for the solution of Chicago's transit problem, providing for the immediate construction of an independent combined subway and elevated system and for acquisition of ownership by the city on terms reasonable and satisfactory to the city, was recently proposed to Mayor Thompson and Alderman Joseph B. McDonough, chairman of the local transportation committee, by John M. Harlan, attorney for the F. J. Lisman interests of New York. As outlined in Mr. Harlan's letter, the new plan provides for the purchase of the Surface Lines' properties by the Lisman interests and for the immediate transfer of these properties to the city, in consideration of a lease to the company to operate them. Later, it is pointed out, the elevated lines can be acquired, while subway construction could start at once.

"If the city will grant the Lisman plan ordinance to a company organized by my clients," Mr. Harlan declared, "then that company, after it acquires the tangible properties of the surface lines, executes its mortgages, issues its securities and exchanges some of them for those of existing companies, would, when requested by the city, give and transfer to the city all these tangible street railway properties." Legal ownership by the city, which is made possible by this plan, Mr. Harlan added, means an estimated saving in taxes of $3,600,000 a year and would do away with the possibility of interference in control by the Illinois Commerce Commission, inasmuch as that body's act expressly excludes city-owned public utilities from commission jurisdiction.

The original Lisman plan, as presented to the City Council last November and subsequently drafted into ordinance form, provided for the return of the surface lines and the subway system to the city of Chicago for $1 at the end of 30 years operation. This was to be accomplished by retiring all obligations through the operation of a sinking fund.

Another St. Louis-Kansas City Application Filed

The St. Louis-Kansas City Short Line Railroad has filed a new application with the Missouri Public Service Commission for a certificate of convenience for the construction and operation of an electric interurban line from St. Louis to Kansas City, Mo. Such a permit has been sought since January, 1925.

The commission denied the original petition on the ground that the company had not made adequate showing of its financial ability to carry through the project. The company then went to the Cole County Circuit Court and later to the Missouri Supreme Court. This appeal was dismissed in the Supreme Court a few weeks ago.

The proposed line would cost $55,000,000, according to the estimates of its promoters. Surveys, franchises and right-of-way already secured are listed at a valuation of $20,000,000, while expenditures made to date total $26,000. The former application was vigorously opposed by the steam railroads operating between St. Louis and Kansas City. They contended that the towns traversed had adequate service.

St. Paul Fare Hearing on Nov. 1

The city of St. Paul, Minn., will ask for a lower valuation of the property of the St. Paul City Railway at the hearing of the company's application for a higher rate of fare before the Minnesota Railroad and Warehouse Commission. E. W. Bemis and other traction experts have the case under preparation. The hearing was set for Oct. 24 and postponed to Nov. 1.

The voters on Sept. 8 failed to pass a charter amendment which would have enabled the city to offer the railway relief from paving between tracks and other charges to offset the low return on its investment. The present rate in each city is 8 cents cash or six tokens for 40 cents. Corporation Attorney A. A. Stewart has as yet not agreed to such a retaliatory measure as action to banish the company's buses from the streets because operated without franchises or to compel the company to pave between tracks for 16 miles, which would cost $800,000. Details of the company's petition were given in the ELECTRIC RAILWAY JOURNAL, issue of Sept. 17, page 536.

Illinois Traction Will Co-operate to Serve Football Fans

Tariff information concerning several of the important football games has been released by the Illinois Traction System's traffic department. For the Illinois-Michigan game and annual homecoming, Oct. 29, a rate of one fare for the round trip from Illinois points and St. Louis to Champaign-Urbana is authorized good going and returning on Oct. 29. A rate of 1½ fare for the round trip is authorized for the same game going Oct. 28 and 29 with final return limit to leave Champaign not later than midnight Oct. 30.

For the Illinois-Chicago game and Dad's day, Nov. 12, the one-fare, round-trip rate is in effect good going and returning Nov. 12, and the rate of 1½ fare for the round trip going Nov. 11 and Nov. 12 with final return limit to leave Champaign not later than midnight Nov. 13. The minimum fare for both games is $1.

Piedmont & Northern Railroad Will Renew Efforts to Extend

The Piedmont & Northern Railroad is prepared to continue its efforts to extend its lines in North Carolina and South Carolina before the Interstate Commerce Commission until the full commission has had an opportunity to vote on the proposal. Officials of the line have made this announcement.

Five-Cent Increase on Penn-Jersey Route

An increase in fare from 15 cents to 20 cents has been put in effect on Route No. 5, operating between Philadelphia and Moorestown, by the Penn-Jersey Rapid Transit Company, operated by the Philadelphia Rapid Transit Company. The old rate was 15 cents per zone. This will make the minimum fare on the line 20 cents.

Increase Rates on Illinois Lines

Fares on the Illinois lines of the Tri-City Railway, operating in East Moline, Moline and Rock Island, Ill., were increased Oct. 15 from seven tickets for 50 cents and fifteen for $1 to three for 25 cents, with the 10-cent casual fare basis retained. Children's fares were raised from 4 cents to 5 cents. Efforts to win a higher fare date back to 1925, when identification cards were discontinued.

Garden Club in Portland

A large and well-organized Garden Club is the latest idea of Bill Strandborg, the ever-progressive publicity agent of the Portland Electric Power Company, Portland, Ore. He believes that within the personnel of the company are hundreds of experienced and enthusiastic flower growers who might capitalize on their knowledge and the wonderful opportunities afforded in the territory of Portland for plant development. Annual contests for trophies, flower show exhibitions, improvement of individual gardens, comforts for hospital patients, even improvement of the landscaping values of the company's properties—all such objectives might be worth the carrying out of the idea. All those who are interested have been asked to send names, addresses and names of departments to publicity department.

Eight Cents Sought in Allentown

The Lehigh Valley Transit Company, Allentown, Pa., has petitioned the Pennsylvania Public Service Commission for permission to charge an 8-cent fare. The present rate is 7 cents.

Season for Learning Opens in Boston in November

In a ten-page pamphlet the educational program of the Boston Elevated Railway, Boston, Mass., is set down with a foreword to all "L" employees announcing the opening of the fifth season of the company's educational plan. As last year, the season will cover practically the five months from Nov. 1 up until March 31.

The 1927-1928 program includes the continuation and repetition of some popular courses and the introduction of two or three new ones. Such subjects as "making the most of one's personal resourcees," "woman's interests," "caring for automobiles, buses and trucks" and

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"investing one's funds" are listed. A popular course in every-day law is especially recommended. The schedule has been arranged so that an employee willing to devote an evening a week to mental improvement, relaxation and good-fellowship can get a variety of opportunities.

Service Annuity Plan for Alabama Workers

A service annuity plan has been authorized by the board of directors of the Alabama Power Company, Birmingham, Ala., effective Oct. 1, which makes provision for all employees incapacitated by age and whose service records entitle them to recognition by the company. The company has heretofore made provision for death benefits through the Group Insurance Plan. The Alabama Power Company operates 89 miles of line, including the systems at Anniston, Gadsden, Huntsville, Montgomery, Sheffield and Tuscaloosa.

Ten Cents in Holyoke

The Holyoke Street Railway, Holyoke, Mass., was authorized by the Public Utilities Department Oct. 20 to increase cash fares from 6 to 10 cents. At the same time the department ordered a readjustment of the rate schedule so that residents of Chicopee and Chicopee Falls may ride between those points for a single fare instead of two fares, as proposed in the company's schedule.

Baltimore Appoints Counsel in Fare Hearing

Mayor William F. Broening of Baltimore has announced that the city will be represented by Simon E. Sobeloff, who has just been appointed Deputy City Solicitor, at the hearing on the application of the United Railways & Electric Company for a permanent 10-cent fare. The hearing will open on Oct. 27 before the Maryland Public Service Commission.

Trained Musicians Hail from Pittsburgh

Whether it be symphony, operatic selection or just plain jazz, the band of the Pittsburgh Railways, Pittsburgh, Pa., is doing a real job, and if it had not won a name for itself in its own city, it surely established itself as an institution at the recent American Electric Railway Association convention in Cleveland. Returning delegates are loud in their praise of the band, which attracted throngs to the Esplanade every day to hear its concerts.

This organization of 40 musicians,

J. B. Donley

who play under the leadership of Alois Hrabak, is composed entirely of employees of the Pittsburgh property. Great credit for the excellence of the band is due to Conductor Hrabak himself, who worked with untiring effort to bring the band to the popularity it enjoys today. But back of all this success is the dogged determination of Joseph B. Donley, director of public relations of the Pittsburgh Railways, who acts as manager of the organization, which is considered part of his department. Mr. Donley is the up-and-doing, progressive type that will bring to this organization the credit it deserves. The musicians themselves have taken a great interest in its success, devoting each Thursday night after a hard day's work to the practice of various numbers.

Port Arthur Council Shows Faith in Utility

In response to a communication from J. G. Holtzclaw, manager of the Eastern Texas Electric Company, requesting that an extension of time be granted that company for concluding the taking over of the interests of the Port Arthur Traction Company, Port Arthur, Tex., the City Council granted an indefinite extension of time. In his letter Mr. Holtzclaw said that he was quite sure that what the people of Port Arthur desired was a transportation system which would adequately fill the needs of a growing city. He was quite sure that the City Council would carefully weigh any proposition which might be put to it to furnish transportation to the city.

P. R. T. Men Don Naval Type Caps

More than 6,000 trainmen and 85 supervisors of the Philadelphia Rapid Transit Company, Philadelphia, Pa., blossomed forth in new naval type caps on Oct. 15. The caps are similar to those used by commissioned and non-commissioned officers of the naval service, being of a dark blue felt with a semi-flexible crown. This headgear will be more comfortable and of longer life than the winter headgear formerly standard on the system. An added advantage lies in the fact that the new caps will be usable the year round, whereas it has hitherto been necessary for trainmen to purchase not only a felt cap for winter use but a straw headgear for warmer weather.

The supervisors—men who are on the streets day and night to maintain schedules and to handle emergency transportation conditions—will have a new badge to be worn at the front of the cap, just above the visor. Trainmen's badges will be unchanged.

Strike up the Pittsburgh band

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Recent Bus Developments

Votes to Deny Indianapolis Bus Purchase

The Indiana Public Service Commission, at a special meeting Oct. 14, voted not to change its order denying the Indianapolis Street Railway permission to buy the stock of the Peoples Motor Coach Company for $500,000. This means that the transcript of evidence heard by Circuit Judge Harry O. Chamberlain, Indianapolis, on the appeal of the car company against the commission's order, will be returned to the court and Judge Chamberlin will rule, upholding or reversing the commission's order. The commission twice has refused the merger on the grounds that $500,000 was too high a price for the bus company. Under the last utility legislation, the car company appealed to the Circuit Court. Transcript of the court testimony was sent to the commission so that it might change its order, if it desired, before the court acts.

The communication to the court pointed out that the car company still intends paying 8 per cent interest for $500,000 it must borrow to purchase the bus company and declared that while the bus company made $6,493 in the first seven months of 1927 the history of the railway did not indicate it could operate the bus lines and make a net profit above interest charges on the purchase price.

Tramway Would Run Desired Line in Denver

Business men of Denver, Col., have asked the city officials to sanction a bus route from the Union Depot up Eighteenth Street to the outer edge of the city. The Denver Tramway shows a willingness to operate the buses and intimates that if the project is sanctioned it will issue transfers between the buses and its cars with a fare of about 10 cents. The carfare now is 8 cents or two tickets for 15 cents. The Denver Tramway operated cars up Seventeenth Street to the outer edge of the town some 6 or 7 miles, but abandoned the service on Eighteenth between the Union Depot and Broadway about two years ago.

Railway Would Prevent Bus Interference in Indiana

Suit for an injunction to prevent the Marion-Fort Wayne Motor Coach Company of Indiana from operating a bus between Fort Wayne and Waynedale, Ind., until authority has been secured from the Indiana Public Service Commission has been filed in the Circuit Court at Fort Wayne by the Indiana Service Corporation, railway operator in that section. The bus company has not the authority to carry passengers between Fort Wayne and Waynedale, the complaint alleges. The Indiana Service Corporation does have authority to carry passengers between these two points.

Buses to Serve on Certain Connecticut Runs

The Connecticut Company will cease operation on the Green line between Waterbury and Milldale, Conn. It is proposed to continue this line only between Waterbury and the Mountain. The New England Transportation Company, a bus subsidiary of the New Haven, will operate a line from Waterbury to Hartford which will furnish the transportation for the other part of the Waterbury-Milldale line.

Comforts of the Auto

STREET cars are being built with automobile trimmings, according to report from the American Electric Railway exposition, in order to lure back their rapidly deserting patronage. New cars are to have tilting seats, upholstered in leather, vestibules built on windshield lines and motor horns in place of gongs.

This may be a good beginning, but still it is hardly enough to make the confirmed autoist feel at home in a street car. Before this is accomplished it will be necessary to put a number of bumps in car tracks and lower the roof of cars so that passengers can crack their domes against the top every once in a while. Another improvement should be the removal of straps so that passengers will be required to sit in one another's laps. This will appeal particularly to the high school and college trade.

Then it should be arranged that, at stated intervals when the car is bound toward town with a load on the way to work, it will blow a tire and the passengers will have to get out and help the motorman change it.

There should, by all means, be a parking problem created to give patrons a real sense of having driven down in their own cars. It ought to be arranged that each street car, upon arriving at the downtown section, must drive around the block at least six times before finding a place to stop, where passengers may alight.

It would also help further the illusion if the cars can be saturated with an aroma compounded of the smells of exhaust gas, hot oil and burning rubber.

When these reforms are accomplished a good beginning will have been made at equipping street cars with all the comforts of the auto.

—*Omaha World-Herald.*

Bus Service in Iowa Planned

The Iowa Railway & Light Company has filed a petition in the Marion County District Court, Cedar Rapids, Iowa, asking for authority to abandon its interurban line connecting Cedar Rapids, Mount Vernon and Lisbon. The company, which has operated bus lines in part-time service over the routes, will establish complete bus service later.

Increased use of automobiles, especially since the paving was laid, was credited with the slump in business on that line, necessitating its disuse. The interurban line was built in 1912. Corporation officials say that at no time did it yield a profit.

Petitions for Kansas City, Kan., Bus Line

A petition for a bus line to connect the Rosedale and Argentine districts of Kansas City, Kan., was filed Oct. 4 with the City Commissioners by the Castle Hill Improvement Association. The commissioners will refer the petition to the Kansas City Public Service Company. Street car patrons at present must go through Kansas City, Mo., to travel between the two districts.

Boston Shoppers Ride Free

A free bus service for shoppers in Boston, Mass., has been arranged by the retail trade board of the Boston Chamber of Commerce with the Motor Mart in Park Square and the Bowdoin Square garage, which are on opposite sides of the shopping district. A ten-minute schedule will be maintained from 8 a.m. until 6 p.m. between these garages and about twenty co-operating stores, which are the leading stores in the city. It is expected that this will induce people coming into the city in their own automobiles to park them at the garages for the day or for the visit and ride to their destination in the free buses, thus relieving street congestion. Many prominent mercantile houses are sponsoring the service.

Hearing on Westchester Fare

A hearing on the Westchester Street Transportation Company's petition to increase from 10 to 20 cents its fare from White Plains to Tarrytown, N. Y., was heard on Oct. 19 by acting Public Service Commissioner H. M. Chamberlain in the offices of the Public Service Commission, New York, N. Y. Officials of the petitioning company and the Third Avenue Railway, which recently purchased the Westchester Street Transportation Company for $70,000, attended. The fare increase is sought on the ground that the company is losing money.

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Financial and Corporate

Kaw Valley Reorganized

Interest charges cut from $82,470 a year to $30,000 under plan promising for the future

THE Kansas City, Kaw Valley & Western Railroad has been incorporated in Kansas to take over the properties of the Kansas City, Kaw Valley & Western Railway in accordance with the reorganization plan submitted by the protective committee for the holders of the first mortgage 6 per cent ten-year gold bonds of the old company, sold at foreclosure Sept. 12 and purchased for $300,000 by the bondholders' protective committee. The new company is capitalized as follows:

First morgage 4 per cent twenty-year bonds, authorized	$1,000,000
Non-cumulative 6 per cent preferred stock (par $25) authorized	250,000
Common stock without par value, shares	12,000

The first mortgage bonds are to be dated Oct. 1, 1927, bear coupons payable semi-annually at the rate of 4 per cent per annum and be in the denomination of $25, $75 and $1,000. Bonds shall be secured by a first mortgage upon properties of the company. In order to provide the company with funds for capital improvements without resorting to an assessment against depositing bondholders, the first coupon on the bonds due April 1, 1928, will be detached and surrendered to the company for cancellation.

The preferred stock is to be issued in shares having a par value of $25, be entitled to non-cumulative dividends at the rate of 6 per cent per annum, be preferred as to assets to the extent of $25 per share and be subject to redemption by the company, at its option, at par. Each share of preferred stock is to carry the same voting rights as each share of the common stock.

There are to be 12,000 shares of authorized common stock without nominal or par value.

Upon surrender of certificates of deposit, the holder will be entitled to receive first mortgage bonds in principal amount equal to 75 per cent of the principal amount of Kansas City, Kaw Valley & Western Railway first mortgage bonds deposited by him, and preferred stock having a par value equivalent to 25 per cent of such principal amount, together with voting trust certificates for one share of common stock for each $100 of the bonds deposited by him. The common stock is to be held for a period of three years by voting trustees to be originally selected by the committee under an agreement approved by the committee.

Of the new first mortgage bonds not needed for this exchange, $150,000 in principal amount is to be delivered into the treasury of the company, to be used for general corporate purposes and the balance of the authorized first mortgage bonds is to be subject to issuance only upon conditions to be provided in the mortgage.

A small number of shares of preferred stock not needed for exchange will remain as authorized unissued stock. About 30 per cent of the authorized common stock will not be needed for the exchange and this stock will be held in the treasury of the company and all or part of it set aside to be used by the directors for the purpose of procuring a successful operating management, the committee being convinced that it will be to the interest of the new company to have the management financially interested in the prosperity of the company.

The outstanding capitalization of the new company, upon completion of the plan, would then be substantially as follows:

First mortgage bonds	(a)	$784,500
Preferred stock		211,500
Common stock, shares	(b)	12,000

(a) $150,000 will remain in the treasury of the company. (b) 3,540 shares to be available for management.

The petition for the foreclosure of the mortgage securing the first mortgage bonds was filed with the court on July 15, 1924, but due to the pendency of the litigation was not acted upon by the court until June 15, 1927, at which time the petition was granted and an order of foreclosure and sale was entered, the sale being later set for Sept. 12, 1927. Just previous to the filing of the petition the company informed some of the bondholders early in July, 1924, that it would not be in a position to make payment of the first mortgage bonds which were to mature Aug. 1, 1924. At the time of the formation of the committee, members understood that $846,000 of these bonds were outstanding, but upon investigation discovered that $224,000 additional bonds had recently been taken from the treasury of the company and that its books showed the amount of bonds outstanding to be $1,070,000. In the meantime, the U. S. District Court for the District of Kansas had appointed Harry C. Jobes receiver, and at the request of the committee the receiver brought an action to cause the bonds taken from the company's treasury to be returned. The case, having been decided in favor of the receiver, was appealed to the U. S. Circuit Court of Appeals, where the trial court was sustained and later a petition for rehearing in the Circuit Court of Appeals was denied.

The committee has kept in touch with the operations of the receiver and believes that the property has been ably managed under him by W. R. Taylor and his associates. The operating statement is shown in the table below.

While the passenger business has been decreasing, there is an encouraging tendency for the freight business to increase. The receiver has continued policies begun by the company in 1916 to build up the freight business and has made considerable expenditures to this end. The company interchanges more than 11,000 carloads of freight a year with several large railroads and the management believes that additional freight business can be obtained. The prospect for an increase in the passenger business, however, is not encouraging the increase in this department in 1926 over 1925 being due to special road conditions which are not likely to recur. The opinion of the management and of the committee was that any reorganization of the company should not involve fixed capital charges in excess of $30,000 per annum. After thorough analysis of the figures, and after making allowance for the additional costs of the receiver and certain unusual maintenance charges the committee was of the opinion that the company could pay fixed charges of that amount.

It will thus be seen that interest charges on this 41-mile road have been reduced under the reorganization from $82,470 a year to $30,000 a year under terms that have taken into account only the holders of the first mortgage bonds.

OPERATING STATEMENT KANSAS CITY, KAW VALLEY & WESTERN RAILWAY

	Six Months Ended June 30, 1927	Calendar Years 1926	1925	1924
Total operating revenue	$208,623	$460,926	$366,845	$375,528
Operating expenses	134,735	299,408	261,046	234,591
Maintenance of way, structures and equipment	53,134	102,732	89,326	82,458
Taxes	6,000	12,054	6,800	19,698
Net revenues	$14,754	$46,732	$9,673	$38,781
Other income—less other deductions	1,666	458	761	10,292
aNet vailable for interest and depreciation	$16,420	$47,190	$10,434	$49,073

Private Company Would Take Over Municipal Properties

A struggle over the issue of municipal ownership of public utilities impends in Seattle. It will be ushered in in the form of a drive by the Puget Sound Power & Light Company to force the city of Seattle out of both the light and power and the railway business, it is stated. A. W. Leonard, president of the power company, has declined to disclose details of plan, but letters to Western Washington residents who have recently purchased shares in his concern say:

We have never made a political appeal to our stockholders, but we shall, of course, when the time comes—and some of them will come to the front for us.

The plan was brought to a head when Mr. Leonard made an offer to the city

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to furnish power for lighting city streets at a rate considerably lower than that now charged by the municipal light department. The City Council refused to entertain the offer, and Mr. Leonard has demanded that it be reconsidered, declaring that the light department is going into debt at a rate so alarming that within five years its payments on outstanding bonds will exceed the amount of its gross revenues. Mr. Leonard says:

The solution is for the city to lease its power and light and its railway properties to a private company, like ours, at a rental based upon fair valuations. Because we would not be required to pay taxes on these properties and through economies resulting from the elimination of duplications—we would not have to increase our overhead at all—we would be able to make a substantial reduction in rates here under such an arrangement.

Bankruptcy Petition in Hannibal

The Hannibal Railway & Electric Company, Hannibal, Mo., filed a petition in bankruptcy in the United States court in that city on Oct. 10 and Frank T. Hodgdon, local banker and president of the company, was appointed receiver. No schedule of liabilities was filed but an officer of the company estimated that the company owed $200,000.

Control of the company was purchased last winter by owners of the Hannibal Transportation Company, operating bus lines in and out of Hannibal. It was stated that the bankruptcy proceedings were taken to dispose of the indebtedness taken over with that deal. As a result of settlement of a suit for paving bills and for power the company owes the city more than $16,000.

Wisconsin Taxes Total $3,945,497

Electric railways operating in Wisconsin will pay taxes of $3,945,497 on the basis of assessed valuation of $209,155,000, according to figures revealed by the Wisconsin Tax Commission. The tax rate was slightly higher this year than last year.

A. E. Fitkin & Company Retire from Utility Field

A. E. Fitkin, who recently bought the Stock Exchange membership of Walter L. Ross for $240,000, will hereafter conduct the firm of A. E. Fitkin & Company, New York, N. Y., as a general investment and Stock Exchange house. This announcement was made on Oct. 17 by A. E. Fitkin, who made known his own retirement from the public utility field and the sale of the Inland Power & Light Corporation for $30,000,000 to Samuel Insull & Sons, Inc. Only a few miles of railway line in Arkansas are included in the Inland Power & Light Corporation.

Mr. Fitkin will leave for Europe on Oct. 26, where he will establish foreign connection for his firm. He entered the public utility field fifteen years ago. Since that time he has acquired properties all over the country. He has been disposing of them for the past year.

Conspectus of Indexes for October, 1927

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Oct. 1927 **7.54**	Sept. 1927 **7.53**	Oct. 1926 **7.40**	Oct. 1927 **7.54**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Oct. 1927 **142.1**	Sept. 1927 **141.6**	Oct. 1926 **155.4**	Sept. 1920 **247.5**	Sept. 1927 **141.6**
Electric Railway Wages* 1913 = 100	Oct. 1927 **228.2**	Sept. 1927 **228.0**	Oct. 1926 **226.2**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Oct. 1927 **199.2**	Sept. 1927 **199.4**	Oct. 1926 **202.9**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Oct. 1927 **204.4**	Sept. 1927 **203.6**	Oct. 1926 **209.8**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Sept. 1927 **145.7**	Aug. 1927 **146.6**	Sept. 1926 **150.5**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Oct. 1 1927 **13.26**	Sept. 1 1927 **12.90**	Oct. 1 1926 **12.79**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Sept. 1927 **154.0**	Aug. 1927 **152.4**	Sept. 1926 **158.5**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Sept. 1927 **162.8**	Aug. 1927 **162.0**	Sept. 1926 **166.8**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Sept. 30 1927 **3.148**	Aug. 31 1927 **3.196**	Sept. 30 1926 **3.594**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	Sept. 1927 **18.62**	Aug. 1927 **17.92**	Sept. 1926 **18.12**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	Sept. 1927 1418	Aug. 1927 1448	Sept. 1926 1250	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**40.08**	**44.37**	**35.29**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

35,000 Shares of Pennsylvania-Ohio Stock Offered

The Pennsylvania-Ohio Power & Light Company, Youngstown, Ohio, through a syndicate including Bonbright & Company and Eastman, Dillon & Company, is offering at $99 per share and accrued dividend, to yield about 6.05 per cent, 35,000 shares of its $6 cumulative preferred stock. The proceeds from the sale of this issue of preferred stock will reimburse the company for expenditures for additions and improvements to its properties and provide funds for other additions and improvements already contracted for. The Pennsylvania Power & Light Company controls the Shenango Valley Traction Company.

Byllesby Buys Wisconsin Property

Acquisition of the Wisconsin Valley Electric Company, Wausau, Wis., by the Standard Gas & Electric Company was announced on Oct. 18 by H. M. Byllesby & Company. Nine miles of railway line is included in the deal.

Boston & Worcester Sale Approved

Approval of the reorganization of the Boston & Worcester Street Railway under a new name and new capital was asked in a petition presented in Boston on Oct. 18 to the State Department of Public Utilities by Henry B. Rising of Newton, Mass. Mr. Rising and fifteen associates bought the railway following a Supreme Court decree of foreclosure issued on behalf of Middlesex County. The court confirmed the sale. The new company would be known as the Boston, Worcester & New York Street Railway Company, with a total capital stock of $2,152,000. The sale was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 15, page 758.

Piece of New Jersey Property Sold

The New Jersey Board of Public Utility Commissioners has granted permission to the Public Service Railway, Newark, N. J., to sell a parcel of land at Bonhamtown for $9,000. The property has been purchased by a church.

Increase in Capital Stock in Bristol

The Bristol Traction Company, Bristol, Conn., has filed notice of an increase in capital stock from $50,000 to $750,000. To provide for the increase the company has issued 7,000 additional shares of a certain class of stock with a par value of $100. Stockholders recently voted in favor of the increase. The company was only recently incorporated and previously was operated as a part of the Bristol Electric Light & Power Company.

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Personal Items

F. W. Doolittle Heads East St. Louis Properties

No more logical successor to the post vacated by W. H. Sawyer as president of the East St. Louis & Suburban Railway and its affiliated properties in East St. Louis, Ill., could be found than F. W. Doolittle, vice-president of the North American Company, New York, N. Y., controlling company. Mr. Doolittle's appointment was recently made following the resignation of Mr. Sawyer to assume the presidency of Stevens & Wood. Mention of the latter change was made in ELECTRIC RAILWAY JOURNAL, issue of Oct. 15, pages 762 and 763.

F. W. Doolittle

For several years Mr. Doolittle was intimately identified with the activities of the North American Company and its subsidiaries as a special rate and valuation engineer with headquarters at Milwaukee, Wis. Early in 1923 Mr. Doolittle was made vice-president of the North American Company along with J. F. Fogarty. He had been retained by the North American Company since 1916 as consulting engineer and had handled investigations of its new properties and rates and valuation cases for its subsidiaries before various commissions. Prior to that he had been director of the Bureau of Fare Research of the American Electric Railway Association and had won no little attention for the publication of his book on electric railway rates and service known as "Studies in the Cost of Urban Transportation Service."

Mr. Doolittle was born in Hopkinton, Iowa, in 1883. He was graduated from Princeton University and the University of Colorado. He taught engineering at the University of Colorado and the University of Wisconsin and assisted in the development of the statistical department of the Wisconsin Railroad Commission. From there he went to Springfield, Ill., where he did similar organization work for the first Illinois Public Utilities Commission.

The system over which Mr. Doolittle becomes president covers 126 miles of line serving an estimated population of 131,000. The controlled companies operate the electric railway system of East St. Louis, the only electric line over the Eads Bridge connecting East St. Louis with St. Louis, and interurban lines from East St. Louis to Belleville, Edwardsville and Lebanon.

Control of the operations of the East St. Louis railway properties will be lodged in George W. Welsh and Thomas W. Gregory, resident vice-presidents. The changes are effective Nov. 1.

N. M. Garland to Retire from Active Service

N. M. Garland, affiliated with the Ohio Brass Company, in the New York office, since 1902, will retire on Jan. 1, 1928. He will remain a director of the company, with headquarters in New York, acting in a consulting capacity.

The electrical career of Mr. Garland began in 1892, when he took over the Eastern agency of the Emerson Electric Manufacturing Company. Five years later he became general agent for the Manhattan Electric Light Company and he continued with this utility for a time after it was merged with others to form the New York Edison Company. In 1902 Mr. Garland became Eastern representative of the Ohio Brass Company and since that time he has made a host of friends for the company, has been instrumental in that company's success and has set valuable standards for salesmanship in general. He had the good fortune to become connected with the electrical industry in its earliest days and has made a genuine contribution to its upbuilding.

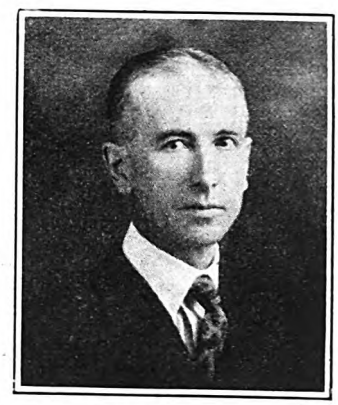
Mr. Garland is a member of many organizations, among them the New York Railroad Club, Engineers' Club, New York Electrical Society and New York Welding Society. His retirement is deeply regretted, but his friends and business associates are rejoicing with him in his ability to follow congenial pursuits.

N. M. Garland

Otto H. Jorgensen, Car Expert, with Cummings Car & Coach

A well-known car builder and designer has become affiliated with the Cummings Car & Coach Company at its shops in Paris, Ill. Otto H. Jorgensen, with the title of engineer, rail car department, will have a part in all new design, development and construction for the company. Car expert is what Mr. Jorgensen really is, judging him in the light of his experiences and accomplishments.

Mr. Jorgensen is best known in the industry as chief draftsman and acting engineer of equipment of the Chicago Surface Lines, where he worked under H. H. Adams, superintendent of shops and equipment from 1921 to 1926. He left Chicago to accept a position with the Pullman Car & Manufacturing Company as assistant engineer and was engaged in that work at the time of his recent appointment.



O. H. Jorgensen

It was in Copenhagen, Denmark, that Mr. Jorgensen received his education and was graduated as an electrical engineer. His first work in this country was as draftsman in the railway department of the General Electric Company, Schenectady, N. Y. This was at the time the first New York Central locomotive was being designed and built. Since that time he has been car-conscious and car-concentrating, devoting all his time and expending much energy on the designing and building of cars of various types, ranging from mine cars, through all types of freight cars, passenger cars and street cars to Pullmans. Covering this intensive period he gave his services to some of the principal car companies in the country, among them being the Standard Steel Car Company, Koppel Car & Equipment Company, now owned by the Pressed Steel Car Company, and the Pullman Car & Manufacturing Company.

During the war Mr. Jorgensen served as First Lieutenant, Q.M.C., and was with the American Expeditionary Forces one year in France and Germany, most of that time with the first division motor supply train. He now holds a commission as Captain in the Reserves.

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G. J. Baker Has Served Industry a Quarter Century

George J. Baker, whose appointment as general manager of the Buffalo & Erie Railway, Fredonia, N. Y., was announced in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 8, 1927, page 721, is well known in traction circles in New York State, where he has had considerable experience.

Twenty-five years ago Mr. Baker entered the employ of the Hamburg Railway at Buffalo as a conductor. Five years later he was promoted to inspector. At this time he took an electric railway correspondence course and made

G. J. Baker

a special study of train rules, train dispatching and time-table making, under R. H. Douglas, then general superintendent of the Buffalo & Lake Erie Traction Company. The latter company had taken over the Hamburg Railway and had started to build the interurban line between Buffalo, N. Y. and Erie, Pa. Operation was begun in 1908, supervised by three different divisions, of which Mr. Baker was in charge of the Eastern Division, Buffalo to Dunkirk.

His first big promotion came on July 1, 1911, when he was promoted to general superintendent of the interurban lines, in charge of all three divisions. Then success virtually followed him. In May, 1913, he was promoted to general superintendent of transportation of the Buffalo & Lake Erie Traction Company, which was then operating in the city of Erie, the Buffalo & Lackawanna Traction Company, the Hamburg Railway and the interurban lines between Buffalo and Erie. In 1917 Mr. Baker was advanced to assistant general manager under A. R. Myers of Erie, Pa., who was then general manager of the Buffalo & Lake Erie Traction Company. He continued in this position until 1924, when the line between Buffalo and Erie was taken over by the Chandler management under George MacLeod as vice-president and general manager. Mr. MacLeod appointed him superintendent and acting general manager during his absence from the property.

Mr. Baker was born in Towanda, Pa., on Aug. 15, 1876. He attended the schools of that village and at the age of eighteen moved to Philadelphia, where he took up tool making and variety lathe turning. He pursued this work until 1902, when he entered the transportation field.

W. W. Wheatly with Investment Bankers

W. W. Wheatly has joined the banking house of George M. Forman & Company, Inc., with offices at 120 Broadway, New York, to assist in the program of that company for widening the scope of its activities in the railway and public utility investment fields. In the past this old-established house, with main office in Chicago and branches in New York and many other cities, has devoted much attention to real estate first mortgage serial and sinking fund bonds, but more recently has been catering to domestic and foreign securities, purchasing whole issues of government, municipal, railroad, utility and industrial securities for distribution at wholesale and retail. It has also been a participant in national underwritings.

Mr. Wheatly is well known in the railway field. He was long connected with the old Brooklyn Rapid Transit Company and subsequently served with the Public Service Railway of New Jersey, the Mexico Electric Tramways in Mexico City and the Metropolitan Street Railway in Kansas City, Mo., now the Kansas City Public Service Corporation. In each of these cities his work gained substantial recognition, particularly in the trying situation incident to the management of the railways in Mexico's capital. There he represented the English investment firm of Werhner, Beit & Company, by which he was intrusted with the entire details of the management of that property. He represented the Marconi Wireless Telegraph Company in its dealings with the Mexican Government.

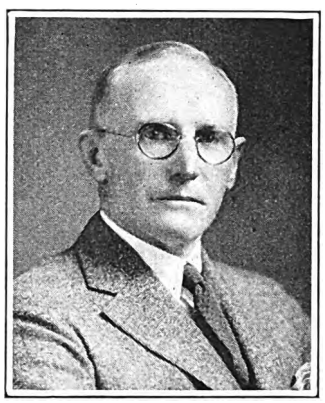
Mr. Wheatly's experience, wide and notable as it is, should strengthen materially the organization of Forman & Company in connection with their plan to enter more extensively into the financing of railways, bus lines and other public utilities. This they intend to do, particularly through their New York office.

John A. Miller, Jr., Honored

On the recommendation of a special committee the board of direction of the American Society of Civil Engineers has awarded the Arthur M. Wellington Prize to John A. Miller, Jr., associate editor ELECTRIC RAILWAY JOURNAL, for his paper on "Increasing the Efficiency of Passenger Transportation in City Streets." This paper was presented at a meeting of the society held in New York City June 2, 1926. An advance abstract was published in the JOURNAL May 8, 1926. The Wellington Prize is awarded annually by the American Society of Civil Engineers for the best paper presented during the previous year on the subject of transportation by land, water or air.

C. N. Chubb Goes to Lincoln

In addition to his appointment as president of the newly formed company known as the Iowa-Nebraska Light & Power Company C. N. Chubb has been appointed president of the Lincoln Traction Company, which supplies transportation service to Lincoln, Havelock and College View as well as the immediate surrounding territory in Nebraska. For the past three years Mr. Chubb's work has covered a wide field as vice-president of the United Light & Power Engineering & Construction Company and as managing supervisor of United Light properties in Iowa,



C. N. Chubb

Nebraska and several other states.

Mr. Chubb has been a prominent figure in utility affairs for many years. In fact, it is said that during his school days he decided that some phase of the utility business should become his life work. Toward this end he studied civil engineering, specializing in steam railway construction, in the Massachusetts Institute of Technology and graduated with the class of 1901. After working for a short time in the steam railway business he saw greater opportunities in gas and electric utilities and joined the Harrisburg Gas Company of Harrisburg, Pa., a subsidiary of the United Gas Improvement Company. Here he served his apprenticeship and for fifteen years continued in the service of properties operated by the United Gas Improvement Company. In addition to his work at Harrisburg he followed gas engineering and superintendence of gas plants at Kansas City, Mo., Sioux Falls, S. D., and South Bend, Ind.

In 1925 Mr. Chubb became vice-president of the United Light & Railways Company and supervisor of the Iowa-Nebraska properties of the United Light.

Mr. Chubb will move his home to Lincoln from Davenport about Nov. 1 with the intention of giving the supervision and management of these properties his entire time and undivided attention.

F. KRUG was recently appointed general manager of the Porto Rico Railway, Light & Power Company, San Juan, P. R. He has been serving as acting general manager.

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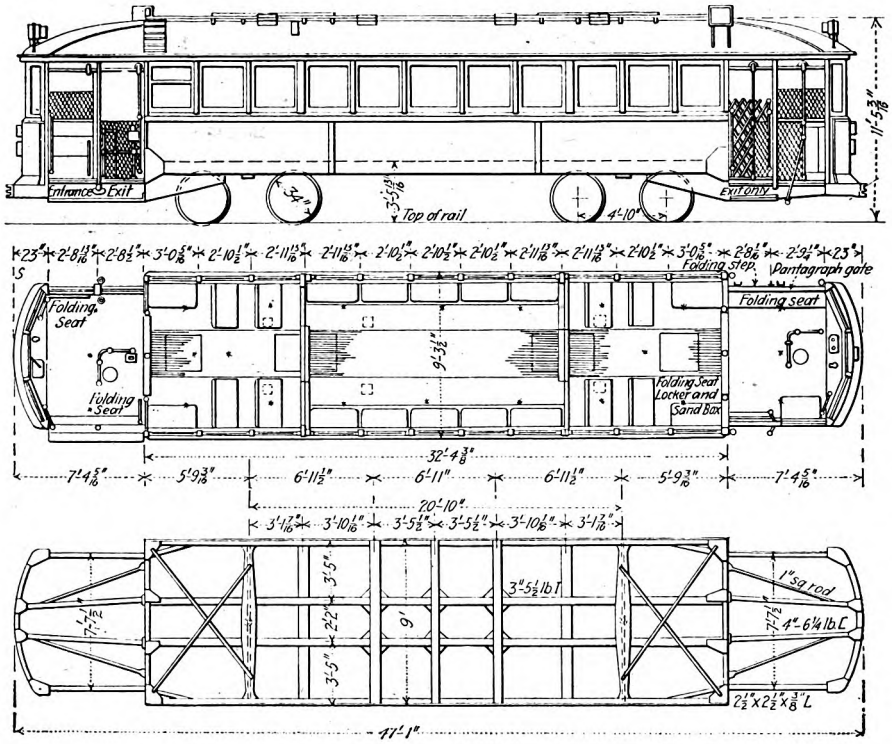
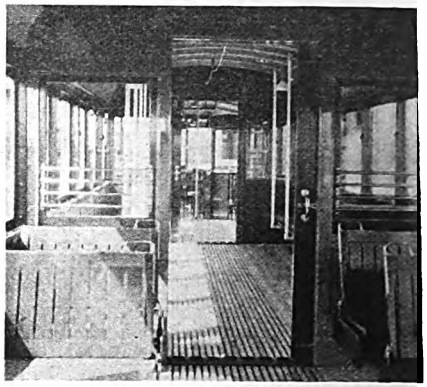
Manufactures *and the* Markets

Specifications for Ten New Units for Municipal Railway

Subjoined are specifications, seating plan, and general dimensions of the ten two-man city type cars ordered recently by the Municipal Railway of San Francisco, mention of which was made in the JOURNAL for July 23. These cars are being built by the St. Louis Car Company from specification used in the construction of the fifteen units delivered by the St. Louis company in May. The units will have a seating capacity of fifty passengers each and are to be of semi-steel construction, similar to the 145 units that were built by the company last year.



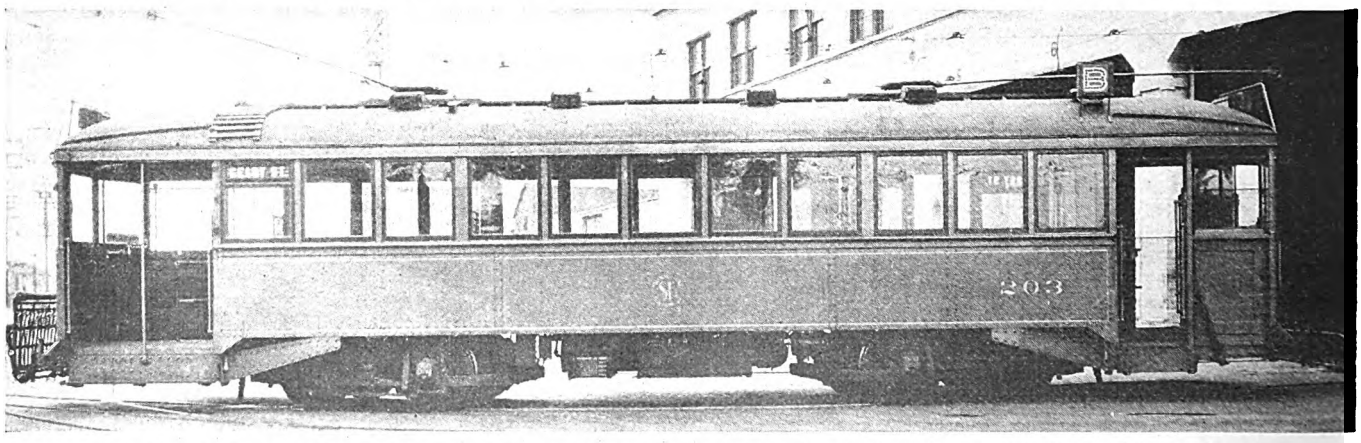
Framework and seating plan, also elevation, of Municipal Railway's new units



Typical interior view of two-man cars recently ordered by the Municipal Railway of San Francisco from the St. Louis Car Company

Spanish Railroads to Electrify

The Oerlikon Company has recently received a contract for the complete electrical equipment of all the substations of a Spanish railroad, the Ferrocarriles Vascongadoes, connecting San Sebastian with Bilbao, on which high-tension direct current is being adopted as the traction system. The substations are fed with three-phase current of 29,000 volts, 50 cycles, which is converted into direct current by means of a rotary converter equipment. The converters are notable, as regards both capacity and pressure. They are being designed for a continuous output of 1,200 kw. and for a terminal pressure of 1,750 volts on the d.c. side.



Exterior appearance and specifications of new 50-passenger, semi-steel units for Municipal Railway of San Francisco, ten of which were ordered recently. These are similar to the fifteen units delivered in May

Number of units	10
Type of unit	Two-man, motor, passenger, city, double end, double truck.
Number of seats	50
Builder of car body	St. Louis Car Company, St. Louis, Mo.
Weight, total	50,000 lb.
Bolster centers	20 ft. 10 in.
Length over all	47 ft. 1 in.
Length over body posts	32 ft. 4⅜ in.
Truck wheelbase	4 ft. 10 in.
Width over all	9 ft. 2½ in.
Height, rail to trolley base	11 ft. 8 in.
Window post spacing	2 ft. 11 in.
Body	Semi-steel
Roof	Arch
Doors	End
Air brakes	Westinghouse SME—D1
Armature bearings	Babbitt
Axles	E-6 forged steel
Car signal system	Faraday high voltage
Compressors	Westinghouse DH-16
Conduit	Pipe conduit
Control	Westinghouse HL
Couplers	Anti-climber
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Sliding
Fare boxes	Johnson
Finish	Paint
Floor covering	Industrial carpet on platforms
Gears and pinions	Nuttall helical
Glass	A.A. and plate
Hand brakes	Peacock, Dayton handle
Headlights	Golden Glow SR-95
Headlining	Haskelite, three-ply
Interior trim	Birch-stained cherry
Journal bearings	Plain
Journal boxes	4¼x8 in. No. 8801
Lamp fixtures	Safety Car Heating & Lighting Co.
Motors	Four Westinghouse 306-CA, outside hung
Painting scheme	Gray—gold stripe, cherry sash
Roof material	National standard FF roofing canvas
Seats	Hale & Kilburn 400-A
Seat spacing	30 in.
Seating material	Slat and plywood
Slack adjusters	American, type J
Steps	Folding
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	Nuttall 20-A
Trolley wheels	Kalamazoo
Trucks	Brill 27-E
Ventilators	Garland exhaust
Wheels	Rolled steel, 34 in. diameter
Wheelguards	Eclipse

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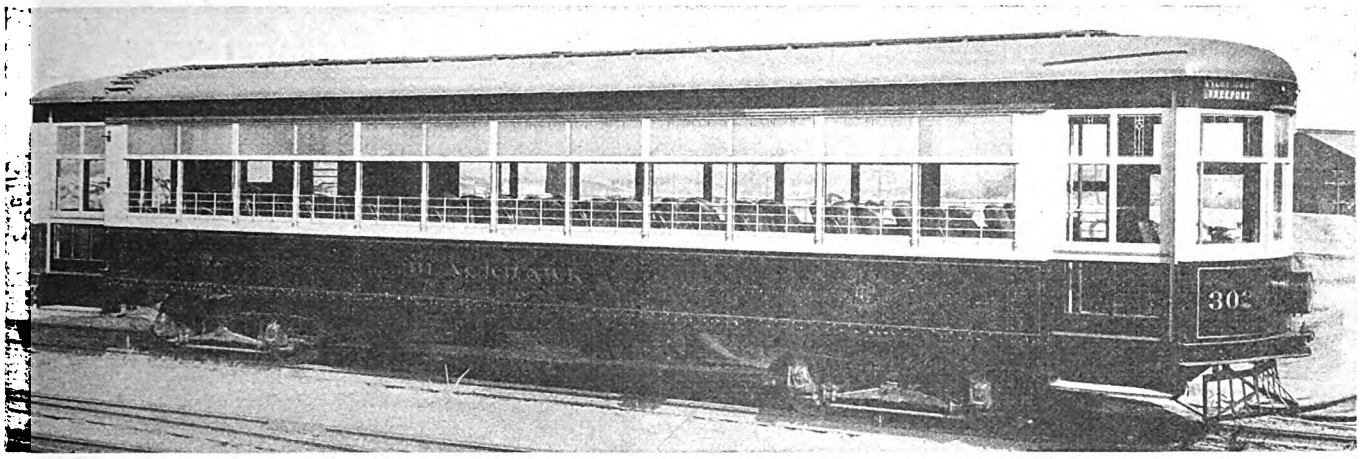


Built with uniform lines and attractively painted, the Rockford & Interurban Railway units present a striking appearance

Rockford Receives Seven New Interurban Cars

The Rockford & Interurban Railway, Rockford, Ill., has accepted delivery on seven new cars ordered on March 2 from the American Car Company of St. Louis.

As mentioned in the JOURNAL of July 30, these cars are of the combination passenger, smoker and baggage car type. The new cars embody the latest in interurban car design and have several new features. Built with low and uniform lines and attractively painted, the cars present a striking appearance. The rear end is of the observation type with a wide center window and awning, as shown in the illustration below.

No ceiling lighting fixtures are present, the indirect lighting system being used. Seats are of the semi-individual type, upholstered in leather. An interesting feature is that each car is equipped with different color seats and interior trim. Consistent with the uniform lines throughout is the one-level floor from end to end.

The cars, which have a seating capacity of 52, are of semi-steel construction and designed for a speed of 60 m.p.h.

Details of the cars are repeated here:

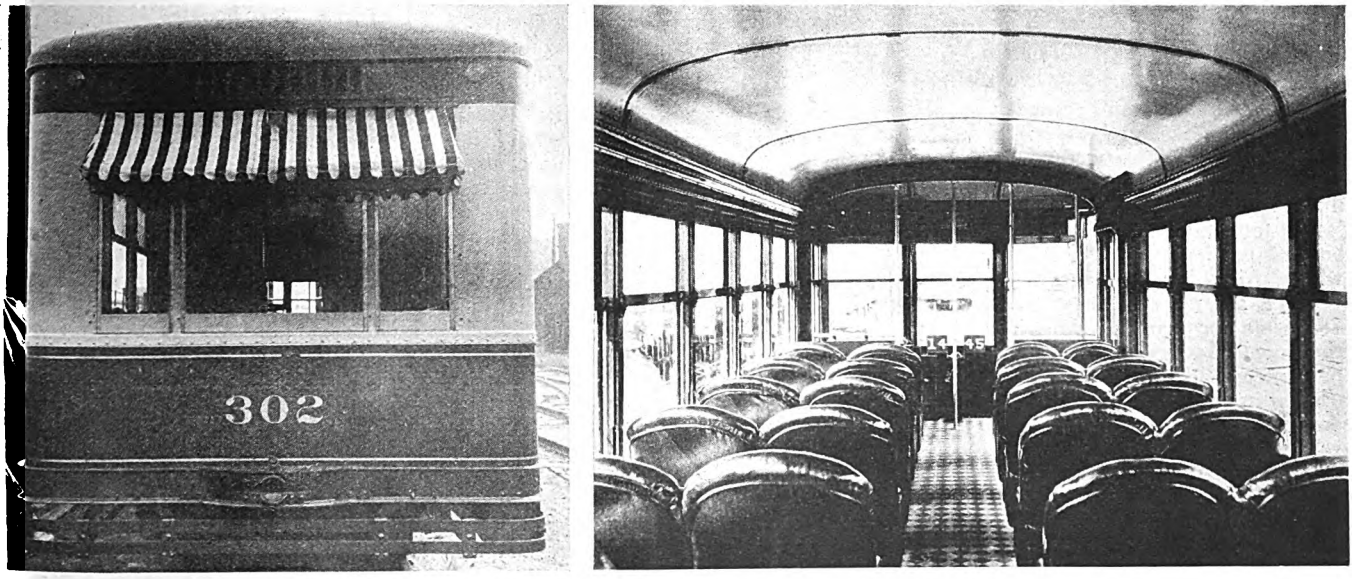
Number of cars ordered	Seven
Builder of car body	American Car Company
Type	Combination passenger, smoker, baggage
Seating capacity	52
Weight, total	35,750 lb.
Bolster centers, length	25 ft. 6 in.
Length over all	45 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8¼ in.
Height, rail to trolley base	10 ft. 8 in.
Body	Semi-steel
Interior trim	Agasote
Headlining	Agasote
Roof	Arch
Air brakes	General Electric, straight
Armature bearings	Ball
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Bronze, oxidized
Compressors	CP-72
Control	K-75
Couplers	American Car Company
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Gears and pinions	General Electric
Hand brakes	Brill vertical
Heater equipment	Railway Utility
Headlights	Crouse-Hinds
Journal bearings	Ball
Journal boxes	J. G. Brill Company
Lightning arresters	Aluminum
Motors	Four GE-247, inside hung
Sanders	Nichols-Lintern Company, No. 4
Sash fixtures	Schechter post casing
Seats	American Wicker Works
Seating material	Leather
Springs	J. G. Brill Company
Step treads	Kass safety
Trolley catchers	Ohio Brass Company
Trolley base	U.S. 20
Trolley wheels	U.S.
Trucks	Brill 177-E-1
Wheels	26-in. rolled steel

Pullman Gets Order for Fifteen North Shore Line Cars

Orders for fifteen new high-speed interurban motor cars for the Chicago, North Shore & Milwaukee Railroad were received Oct. 1 by the Pullman Car & Manufacturing Corporation, Chicago. Each car will be equipped with individual bucket type easy chairs for 52 passengers and will contain a commodious smoking compartment and two lavatories.

N.E.M.A. to Discuss Market Development at October Meeting

Market development will be the keynote of the Briarcliff, N. Y., meeting of the apparatus division, National Electrical Manufacturers Association, during the week of Oct. 24, according to a statement by J. M. Curtin, vice-president in charge of this division. Morning sessions will be devoted to section meetings and business. There will be a banquet Thursday evening and a meeting of the board of governors in New York City on Tuesday evening. On Thursday morning a meeting of the board will be held in conjunction with



At left, view showing the observation type rear end with wide center window of Rockford cars. At right, interior view showing the one-level floor and the deep-cushioned individual type seats. Note the absence of dome ceiling lights

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all officers of the sections and divisions. The above outlines the program planned in connection with the gathering.

Trackwork of International Railway Making Rapid Strides

The International Railway's $250,000 track and paving reconstruction program in Buffalo, N. Y., is making rapid strides toward completion, according to President B. J. Yungbluth. Work was begun on Fillmore and North Parade on Aug. 8, and since that time a force of 150 men have been working steadily laying more than 2 miles of track and concrete, at the average of 267 ft. per day. The company is also laying new tracks and paving on Fillmore Avenue from North Parade to East Ferry Streets. Work on the northbound track has been completed, including concreting. The asphalt surfacing will be finished during the next few days. The stretch from North Parade to Ferry Street on the southbound track has also been completed, the only remaining work being the surfacing of the track from Utica to Ferry Street. Special trackwork being installed at Utica and Ferry Streets is practically finished. It is estimated that with favorable weather conditions the surfacing should be finished and all other work completed on Fillmore in a short time.

On Seneca Street, where work was begun Aug. 15, the eastbound track and paving has been completed from Buffalo River to Graymont Street, except for the stretch between Seneca-Parkside and Cazenovia, where the new track and concrete paving have been laid. On the westbound side of the street, where work was started Sept. 26, new track from Buffalo River to Stevenson has been installed. The excavating machines are rapidly closing the gap on the westbound track from Duerstein to Stevenson, where rails and concrete work are being pushed to completion.

Copper Sales Largest in Eight Months

Extremely heavy copper sales last Thursday, Friday and Saturday at 13¼ cents in the East and 13⅜ cents in the Middle West, following many weeks of dullness, were the feature of the metal market for the week ended Oct. 19. A large tonnage of lead has also been booked, particularly in the Middle West, where prices have advanced.

After having resolutely held out for 13¼ cents for many weeks without getting much business at that level, copper sellers without exception found buyers willing to pay that price last Thursday. An extremely heavy tonnage was sold on that day and the two succeeding days, partly at 13¼ cents delivered in the East, and some at 13⅜ cents in the Middle West. The last three days have been much quieter, but the total business for the week has been the largest since that for the week of Feb. 9.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Oct. 18, 1927
Copper, electrolytic, cents per lb	13.025
Copper wire, cents per lb	15.25
Lead, cents per lb	6.25
Zinc, cents per lb	6.00
Tin, Straits, cents per lb	58.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.625
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.50
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb	13.75
Turpentine (bbl. lots), N. Y., per gal	$0.58

Oct. 18 and Oct. 19 slight concessions in price were made by certain interests, but the market is generally firm. Second-hands are also offering prompt copper a little below the 13¼ cents level.

The zinc market has been as quiet as that of copper has been active. Early in the week prices hardened to 6.10 cents, with slightly higher quotations on occasional lots, but on Oct. 18 and Oct. 19 the metal was offered as low as 6 cents, St. Louis.

Lead sellers have enjoyed an unusually active week, although inquiry on Oct. 19 quieted somewhat. Demand was keener in the Middle West than in the East, and on Friday and Monday good-sized transactions were made at 6.075 cents. In New York the American Smelting & Refining Co. continued its official price at 6.25 cents, and this was the ruling figure for the "outside" market also.

In the New York market prices are firmer, but business is dull. Spot metal commands a ¼ cent premium over late October and ½ cent over December.

ROLLING STOCK

Fresno Traction Company, Fresno, Cal., is reported to be planning the purchase of ten new trolley cars valued at $150,000.

Chicago, Aurora & Elgin Railroad reports receipt of five of the fifteen new de luxe passenger steel coaches, details for which were given in the Journal recently.

Winnipeg Hydro-Electric Company, a municipally owned concern in the Province of Manitoba, Canada, has recently purchased a 20-ton gas-electric locomotive manufactured by the Davenport Locomotive & Manufacturing Company, Davenport, Iowa. The new unit is rated at approximately 160 net horsepower. Gasoline engines are controlled by one hand throttle and the electric motors by a foot accelerator. The cab is equipped with a lighting, heating and ventilating plant. According to advices, two 30-ton models are now in process of construction.

TRADE NOTES

Eric H. Ewertz, past-president of the American Welding Society and formerly general manager of the Bethlehem Shipbuilding Corporation, has opened an office at 50 Church Street, New York, N. Y., as a consulting engineer on problems relating to welding, mechanical and economic engineering.

Alexander Milburn Company, Baltimore, Md., manufacturer of welding and cutting apparatus, has organized an office in Boston to be known as the Alexander Milburn Sales Company, Wiggin Terminals Building, 50 Terminal Street, Boston, Mass. This office is under the supervision of M. B. Crouse and G. B. Malone, both experienced executives in welding and cutting equipment, who will handle the sale and distribution of Milburn equipment throughout New England.

Roller-Smith Company, New York City, announces the appointment of the D. H. Braymer Equipment Company, W.O.W. Building, Omaha, Neb., as its representative for Nebraska and western Iowa. D. H. Braymer is at the head of this organization. The Braymer company will handle Roller-Smith instruments, relays and circuit breakers in the territory specified.

ADVERTISING LITERATURE

Parker Appliance Company, Cleveland, Ohio, has sent out a booklet on Parker tube couplings for copper tube water and gas services.

Linde Air Products Company has issued a 72-page booklet consisting of a report of the design, development, fabrication and testing of a series of oxyacetylene welded roof trusses of the Fink type. It includes drawings, illustrations and tables. As far as possible the contents are arranged in chronological order. The booklet is by H. H. Moss of the development section, engineering department of the company.

General Electric Company, Schenectady, N. Y., has recently issued the following loose-leaf bulletins: G-E squirrel-cage motors, "500 series"; adjustable varying speed motors, type BSR; air compressor governors; vertical "500 series" induction motors; type BTA motors: CR 1038 motor-starting switches; G-E general purpose synchronous motors, "7500 series"; new form R-totally inclosed induction motor, "500 series"; CR 1923-A1 a.-c. jack type disconnecting switches; G-E air heating units and G-E clamp-on units; improved brush-holders and ventilating covers for GE-275 railway motors; primary cutouts for railway signal high-voltage power lines; switchboard recording instruments; horizontal edgewise instruments, types H-5, H-6 and DH-5, and CR 2940 push-button stations.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, October 29, 1927 *Number 18*

Why Favor the Minority?

CHECKS made of the customers arriving at prominent department stores in Detroit reveal that of the total 56.7 per cent come by street car, 24.2 by motor bus or jitney and 19.1 per cent by private automobile. This information is contained in the report of a traffic survey by the Detroit Department of Police, abstracted in this issue. Coupled with this finding is the following statement:

"Street cars using the natural highest speed lane and operating on a local stop service become slow-speed vehicles and, in view of the ordinance requiring other vehicles to stop with them, have a very definite retarding action on all other vehicular movements."

With these facts before them, the authors of the report devote practically all their efforts to facilitate movement of the automobiles. Apparently there is no attempt to analyze the situation or to offer suggestions for betterment of conditions so far as the public carriers are concerned, whether street car or bus. True, comment is made on the trial of the "express-trolley, local-bus" system. This is contained in the meager statement, "It is believed that such a combined service would very materially expedite the flow of all types of vehicular traffic on any street where trolley cars are operated."

No representative of the street railway system was on the committee conducting the survey, which may account for the lack of attention to means for facilitating car movements. This, however, seems to be the defect of nearly every traffic survey of the sort made in an effort to expedite movements generally. More consideration should be given to the street car and bus systems, for it cannot be denied that they carry far more passengers into and out of the congested districts than do all the automobiles that can be operated on the streets. Why not put in the forefront of such investigations men who have spent their lives in studying the expeditious movement of traffic, and let them help in the attempt to move the masses more rapidly?

Tell the Man Farthest Down

CONGRESS will meet within a few weeks, so the time is rapidly approaching when the rate of income tax on corporations for the current year and future years will be determined. The responsibility lies upon the shoulders of all of us of grasping this unusual opportunity to end a glaring injustice at Washington. Corporations are paying 13½ per cent of their profits, of the profits of the stockholders, into the federal treasury—more than 2½ times as much as that paid by individuals and partnerships. Why not point out to the stockholders that they are being penalized? Why not send every last one of them on record a reminder of this federal discrimination and urge them to write their Congressmen? These latter gentlemen believe in the power of numbers, for numbers spell votes, so they will pay more attention to such protests than to those of the allegedly selfish officers of corporations. Tell the stockholders that, no matter what their incomes are, they donate 13½ cents out of every dollar of the earnings of their enterprise to the federal government. Get the small stockholders busy.

Perhaps Congress does not know that upward of 20,000,000 citizens are small stockholders in corporations. A flow of letters into the offices of members from these investors will soon impress them with the importance of tax revision for the stockholders of corporations. These investors should remind their Congressmen, too, that a healthy revision of corporation income taxes will bring many more individuals into the class of income taxpayers, a social advantage the desirability of which will be seen when it is realized that out of our immense population, in excess of 100,000,000 people, only 4,171,051 filed returns for 1925 and only 2,501,166 of these were found taxable.

Tell the story to the man farthest down—he's the stockholder and the taxpayer! And get him to tell his story to his Congressman before the session opens in December.

Planning for the Future

UNLIKE many enterprises, transportation is characterized by its permanence. It is pre-eminently a long-term business. Communities expand along with the transportation service that is furnished. Since the future of the entire scheme of community growth is so intimately tied up with its transportation it naturally follows that there must be a stability to that service. Otherwise the members of the community will not be satisfied to make permanent investments of their own in factories, stores or offices, and homes.

So it is necessary for the electric railway executive to take a long-distance view of his business. Capital expenditures must be made over a period of years, and provision must be made year by year to carry the charges and to amortize the principal, or else to arrange for refunding at the end of the term. Even where franchises are granted for specific periods they are for from 20 to 50 years. This indicates that there must be set up a budget of earnings and expenditures if any plan is to be made for producing the necessary income. Unless this is done capital cannot be attracted.

This long-term viewpoint was urged by several of the speakers at the recent Cleveland convention, particularly George E. Frazer, who advocated making budgets in terms of five to ten years instead of for a short period where results can be predicted more closely. Long-term estimates of this kind necessitate an intensive study of the revenue-producing qualities of the property's assets. If there are portions of the plant that the budget shows the company cannot properly finance and develop, then the budget will suggest the sale of these assets. The budget also should show whether or not other portions of the property are being used to greatest productivity, and

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should suggest ways to improve situations that are not entirely satisfactory.

By making estimates of this sort it is possible to give the prospective investor a truer picture of what the future holds for the transportation property. Accordingly it is easier to interest him in the securities if the set-up is such as to inspire confidence in the management and its ability to carry out the plan as laid down.

Consistency—A Gem in Advertising Business

TO ADVERTISE electric railway rides, while a preposterous idea a generation ago, is now a necessary concomitant of successful operation. The street railway or, indeed, any utility is doomed to die unless through at least one of the sundry media it has reached the man in the street. In one year, according to statistics, public utilities spent approximately $25,000,000 for advertising, of which 63 per cent was used for space in the daily newspapers. Other methods are becoming popular now, for instance the movie, with its unusual opportunity for enlightening while the same time entertaining, and the radio, which will transmit to the listener a true story of the railway's place in the transportation world.

True it is that the use of any amount of newspaper advertising will not direct attention away from the untidy and discourteous conductor, the ramshackle, paintless car and the surly management. Few properties have failed to learn that correction of such matters is an essential of service. Now it is a matter of what can be accomplished with an appreciable amount of properly placed advertising and with the well-trained, well-educated employee and brightly decorated cars and coaches operating as personal salesmen. It is not a debatable point any longer. Advertising sells rides. A well-planned merchandising campaign undertaken by any railway management will cost money, but carried on consistently and courageously over a period of years, even if some of the years be lean, will bring satisfying results, provided, of course, the promise in the advertisements is fulfilled in a service that not only satisfies but also stimulates. Then the result is good will, than which there is no better yield.

Forward Steps in Traffic Regulation

OUTSTANDING in the directed efforts to solve the traffic problem, which was discussed at length in several meetings at the recent Cleveland convention, are the extensive surveys made in some of the larger cities, such as San Francisco, Detroit, Los Angeles and Newark. Street railways co-operating with civic and industrial bodies have contributed in certain of these instances in gathering traffic data and finding means for more efficient use of streets. A general feeling of good will has characterized their participation. Several suggested plans for relief included in the reports have been adopted, or at least given a trial, with satisfactory results. In Detroit the express-trolley, local-bus system, a traffic relief measure advised, is being given a trial on one of the principal lines. Another example of specific action taken is the adoption in Los Angeles of the loading-zone rule, a regulation which has proved effective in eliminating double-line standing of automobiles.

In almost every survey it was discovered that stops due to traffic signals and officers were the chief cause of car delays. Properly designed systems of co-ordinated control are the results of study on this subject. Chicago, Cleveland and Los Angeles have proved the worth of these properly timed devices, which are now being adjusted in other cities.

Another cause of delay and general vehicular obstruction is loading. The use of loading platforms and zones, employing the pay-as-you leave collection system on cars outbound in the congested district, installing double-entrance doors and educating the public to board quickly have all helped to speed up loading. Numerous infractions of parking regulations have also caused much trouble and interference with street car and general vehicular movements. Reports of the many violations have prompted cities to enforce more strictly the existing ordinances.

A big step in reducing car delays has been the modernization of equipment, permitting better acceleration and braking. Several companies in the past year have purchased new rolling stock or have rehabilitated their present equipment. Lighter cars, better powered, are certain to improve traffic flow.

The Hoover Conference recommendations on motor vehicle operation have proved invaluable. The interest shown by the government in solving the great traffic problem of the nation is itself significant of the importance of the situation.

Is Scottish Frugality a Myth?

BRITISH tramway properties follow the commendable practice of publishing in their annual reports extended statistics of operation, among which many of the properties include a tabulated list of the articles turned in to their lost and found departments. These lists are not greatly different from those which might be compiled for American railways, but when published for an entire system they show some surprising details as well as totals.

For instance, the figures in the last annual report for the tramways of Aberdeen, Scotland, rather destroy the legend that the Scotch are supercareful in the attention which they give to their property, or at least that this is so when they travel on the street cars. The lost property returns from Aberdeen also show—at least on their face—a great and unexplainable difference in forgetfulness between Scottish ladies and the men in that far northern country. Otherwise, why should the lost and found department in Aberdeen report the amazing total of 583 ladies' umbrellas left in the cars during the year, as compared with only fifteen umbrellas belonging to the sterner sex? Of course, it would be improper to assume that the forgetful person with the lady's umbrella always belonged to the fair sex. Husbands have been known to borrow their wives' umbrellas and leave them on street cars. But there could not have been very many instances of this kind, because practically the same ratio applies to gloves left on cars in Aberdeen. No man was ever known to borrow his wife's gloves, but the statistics from that city show that there were only 41 gentlemen's gloves abandoned on the corporation's cars and buses during the year, whereas the number of ladies' gloves left during the same period amounted to the amazing total of 1,019.

Not only in these figures but in others farther along in the list the men come off triumphant in this test of comparative absentmindedness. To quote only one more instance: During the year only 38 pipes and 52 tobacco pouches were left in Aberdeen cars. The owners of these articles almost certainly must have been men, because while ladies may like cigarettes they are not addicts of the pipe.

There are other notable items in the list of lost and found articles on the Aberdeen cars. They include 22

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milk cans, 34 boots and shoes, the same number of spectacles, a go-cart and a violin case. But if these records create surprise, what shall be said of the statement that 135 Bibles and hymn books were also abandoned? Were these forgotten through the abstraction of their owners in worldly thought, or because they became engaged with some fellow passenger in one of those theological discussions for which Scotland at one time was—and still is—famous?

These records again emphasize that, after all, the street cars in Aberdeen as well as elsewhere are simply microcosms—miniatures of the world at large. The lost and found department record in Aberdeen, like that in any American city, is but a reflection of human nature, which is much the same everywhere.

High-Pressure Community Development Brings Transportation Difficulties

COMMODITY selling by high-pressure methods is no longer in great favor among progressive manufacturers. Not so long ago it was common practice for the manufacturer to go after every available market without considering the ultimate suitability of his product to the needs of the consumer. Sales and still more sales was the slogan. Today the most successful selling campaigns are directed first to finding the market's needs and then producing the kind of products that meet those needs.

Real estate development companies might well adopt the philosophy which experience has taught the manufacturers. Many of the realtors, as they like to be called, are engaged in high-pressure development schemes planned without consideration of their ultimate effect on the community. Greater and ever greater population is their objective. Of course there is nothing inherently harmful or wrong in population increase. For best results, however, it should be obtained in a natural and orderly way rather than by aggressive campaigns to sell land.

The difficulties that follow from an extremely rapid increase in population are well illustrated by the recent experience of the Long Island Railroad. Within a generation the western end of Long Island has been changed from a rural district to a densely populated suburban community. To some extent this change has been natural and inevitable. To a large extent, however, it has been the result of deliberate efforts to attract more and more people to live there. So successful have been these efforts that the Long Island Railroad now carries almost 100,000 passengers a day into and out of its New York station. The commuters complain that the railroad fails to provide them with adequate facilities. The management asserts that its facilities were designed with a view to trunk-line operation and that the congestion is caused by the tremendous number of short-haul riders, who should be cared for by the New York City rapid transit system. To anyone who considers this problem with care it is obvious that the railroad cannot afford to provide accommodations of trunk-line quality for passengers who ride only a few miles and pay only a few cents fare.

Under existing conditions the long-haul passengers have to suffer on account of the short riders. The real estate developers, however, ignore this fact entirely. They are clamoring for more service to accommodate more people and, of course, to sell more land. The solution of the problem does not lie in this direction. The proper development of Long Island should not be hampered by lack of adequate transportation facilities, but they will not be secured there or anywhere else by fencing between the local interests and the railway. What is needed is less bickering and a greater desire to understand each other's needs and point of view.

Chicago Tackles Its Settlement Problem Again

STEP by step Chicago is getting around again to the consideration of its transit problem. The latest move is presentation of the tentative draft of a new indeterminate permit bill to the sub-committee of the Council on local transportation. This same committee had previously approved the bills dealing with the subjects of subway construction, consolidation, a local transit commission and repeal of the twenty-year limit on electric railway franchises. It was to be expected that the voice of the objector would be heard, and it has been raised, particularly in criticism of the indeterminate franchise plan. This is the feature regarded by the companies as most vital of all to the solution of the problem. Mr. Lisman has renewed his offer in modified form, and the advocates of municipal ownership, with Carl D. Thompson, secretary of the Public Ownership League of America, as their most recent spokesman, have raised their voices in opposition to the acceptance of the plan favored by executives of the surface and elevated lines for fear that it would absolutely preclude any chance of the city to own its local transportation system.

These are merely some of the angles. A final meeting of the sub-committee to approve and recommend the entire set of bills to the full committee on transportation will be held on Nov. 2. To attempt to comment constructively on the measures in anticipation of that meeting would be foolish. To attempt to prognosticate the course the matter will now take would be to speculate about intangibles. The thing that is significant just now is that the matter has again become one of public discussion. It is to Chicago's interest as much as it is to that of the companies that the matter be settled, settled quickly and adequately. It will do no good to castigate the city for its indifference of the past. It is to be hoped that good plans, carefully matured, will meet a better fate than did the bills advanced last year.

Co-ordinated Service Ahead in Indianapolis

CITIZENS of Indianapolis may well be pleased with the prospect of the Indianapolis Street Railway taking over the Peoples Motor Coach Company under a plan that contemplates co-ordination of the two services. This is as it should be. It was a long controversy this, culminating in an appeal by the railway to the Public Service Commission to approve the purchase deal. With that proposal the commission found fault on the score of the price to be paid for the bus carrier and on the matter of the ability of the railway to finance the purchase on terms not onerous to itself. With these strictures the court did not agree.

There is no need to go into that matter here, except to emphasize that the decision stands out as the first one of its kind under the recent law which gave carriers the right to appeal to the courts from decisions of the state regulatory body. There was a real chance for honest difference of opinion over the issues involved in this case. The important point now is not that there never should have been two systems of public passenger service in Indianapolis, but that the city is at last to enjoy co-ordination under conditions that augur well for satisfactory performance by each type of transport operated intensively in the field for which it is best suited.

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Two Transit Reports

Presented in New York

Recommendations of Samuel Untermyer, special counsel to the New York Transit Commission, and C. E. Smith, consulting engineer to the City Comptroller, differ widely. The former desires recapture of existing lines for operation at 5 cents, while the latter proposes unification at a fare to cover the cost of service

WITHIN the past few weeks two notable reports on the New York transit situation have been published. The first is the report of Samuel Untermyer to the Transit Commission reviewing the series of hearings that have been going on for a period of several months before the commission. The second is the report of Major C. E. Smith to City Comptroller Charles W. Berry, answering two specific questions asked him by that official. This latter report was made public on Oct. 24, although preliminary copies were reviewed by several New York daily newspapers previously. The two reports contain so much vital information, and differ so much in their interpretation of the transit problem, that some knowledge of them is essential to an understanding of the situation.

Some of the salient points of the Untermyer report were reviewed in this paper, issue of Oct. 1, page 606, and a still briefer outline of the preliminary draft of the Smith report was given in the issue of Oct. 8, page 717.

Samuel Untermyer, special counsel of the Transit Commission, at the request of that body summarized and reviewed the most material features of the testimony taken before the commission in its studies and investigations leading to a plan of readjustment for the relief of the emergency which has been declared to exist, and for the improvement of service in New York City. Mr. Untermyer's findings are published in a 135-page report with many additional exhibits. Much of the report is devoted to quotations from the testimony of operating officials.

The plan submitted in this report is based primarily on recapture of city-built rapid transit lines with the purchase or condemnation of such portions of the privately built systems as are considered necessary to the formation of an independent municipally owned system, with a revision of the city debt limit to make possible the issue of the necessary securities. The following digest, which gives the high spots only, indicates the procedure recommended for making this possible.

The Untermyer Report

THE city immediately shall terminate all leases of its subways to the New York Rapid Transit Company, subsidiary of the Brooklyn-Manhattan Transit Corporation, and to the Interborough Rapid Transit Company and pay the recapture prices. The city shall buy all the property and assets of the I.R.T., including the Manhattan Railway Company's elevated system, and subways owned by the former company. The city shall form a rapid transit system of these subway and elevated lines.

A corporation shall be formed under the direction of the Transit Commission to lease and operate the rapid transit system thus formed. This corporation shall have a nominal share capital and shall have power to issue securities, to form subsidiary companies if needed and to appoint officers necessary to carrying on its operations. This corporation shall be named "The Board of Transit Control."

The board of directors of the corporation shall consist of nine members, appointed as follows:

Chairman of Board of Transportation of New York City.
Comptroller of the city of New York.
Nominee of the Mayor of New York.
Nominee of Real Estate Board of New York.
Nominee of Merchants Association of New York.
Nominee of Brooklyn Chamber of Commerce.
Nominee of Queensboro Chamber of Commerce.
Nominee of Bronx Board of Trade and Bronx Chamber of Commerce.

The ninth director shall be elected by the first eight selected and shall be president of the corporation.

The Mayor of New York is a member of the board of directors ex officio.

Terms of years of tenure of office of the directors are staggered. The directors serve without compensation, but a nominal sum ($450) is suggested which will be apportioned among those present at board meetings or meetings of the executive committee ($250). No one holding public office is eligible to the board of directors with the exception of the city officials noted.

The board of directors appoints: One or more vice-presidents; a treasurer and assistant treasurers; a comptroller; a general counsel and assistants; a general manager and assistants; a secretary and assistants; a purchasing agent and assistants; such other officials as may be needed.

All contracts and purchases of material and supplies in excess of $1,000 shall be awarded on the basis of competitive bids in conformity to specifications.

The lease shall be 25 years and for renewal terms as may be agreed upon.

The lines shall be operated on a 5-cent fare basis until otherwise required by law.

Gross revenues of the corporation shall be applied as follows: (a) Operating expenses, including overhead charges; (b) maintenance of the properties; (c) fixed charges on underlying liens of property taken over; (d) payment of interest and sinking fund upon the total investment of the city in the leasehold properties; (e) the construction of additional subways and betterments and extensions of existing subways.

If the net revenues are insufficient to meet all the above requirements the city shall make good the deficiency. But on new property expenditures of $100,000 or more the corporation must get authority from the Board of Estimate and Apportionment of the city of New York. A referendum of the people shall be had to vote on their agreement to meet with general taxation returns any deficits that may arise by reason of the 5-cent fare.

The Board of Transit Control shall be under the supervision of the Transit Commission.

It is recommended that the constitutional amendment to

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yield New York City $300,000,000 be passed and the money be used to recapture and purchase the rapid transit lines included in this plan.

I.R.T. Subway Properties Included

Dual Contracts No. 1 and No. 2 between the city and the I.R.T. cover subways built prior to 1913. These include lines in Atlantic Avenue along Flatbush Avenue and Fulton Street to Bowling Green and from South Ferry north to Grand Central, west to Times Square on 42nd Street and thence north on Broadway to 96th Street. Two lines north of 96th Street are included, one going to Broadway and 242nd Street (Van Cortlandt Park) and the other to Bronx Park and 180th Street.

The lease under which these properties are operated by the I.R.T. has no recapture clause but the properties revert to the city upon expiration of the contracts in 1967. The I.R.T. pays the city an annual rental of $2,655,569 for the year ending June 30, 1927, and this sum meets security and sinking fund requirements of the sums invested by the city in these subways. Immediate termination of these contracts and the incorporation of these lines in the city rapid transit system are recommended.

Under terms of Contract No. 3 between the city and the I.R.T. additional subways were constructed. These include: Seventh Avenue line from Times Square to Chambers Street and branches to South Ferry and Borough Hall, Brooklyn, respectively; Lexington Avenue line from Grand Central to 135th Street, Bronx, and two branches, one to Jerome Avenue to Woodlawn Road and the other along Southern Boulevard to Pelham Bay Park; the Eastern Parkway line; the Queensboro subway; the White Plains Road line. The contract with the I.R.T. for these subways contains a recapture clause and immediate recapture and the inclusion of these lines in the city rapid transit system is urged. The cost of recapture of the East Side line only on Jan. 1, 1929, is given as $134,000,000.

Mr. Untermyer advocates the purchase of the entire I.R.T. subway properties and of the Manhattan Elevated Railway Company properties for a total sum of $245,594,000 in the form of 38 and 50-year 3 to 3½ per cent city bonds.

The B.-M.T. Properties

Contract No. 4 between the city and the N.Y.R.T.Co. (B.-M.T.) covers practically all the subway properties of the B.-M.T. system. This contract contains a recapture clause and Mr. Untermyer recommends the city take over the B.-M.T. subways and incorporate these properties into the city rapid transit system. The recapture price given in the report is $62,000,000 as of Dec. 31, 1928. The report continues:

It is estimated that it would cost, at 1926 construction prices, at least $347,180,000 to reproduce the recapturable city subways and equipment of the B.-M.T. system in which the city has an investment as of June 30, 1926, with accumulated unpaid interest and sinking fund charges of $209,333,000, and which the city can recapture as of 1927 for $50,774,000. The B.-M.T. is drawing practically its net profits from this property, while the city is getting nothing and has no immediate hope of realizing anything by way of return on its investment so long as the present condition continues.

Why Surface Lines Should Not Be Included in the Plan

Mr. Untermyer believes that the surface lines should not be included in the plan for the following reasons:

1. They are losing money, not even earning their fixed charges.

2. It would involve the impossible task of negotiating with each of 43 companies included in the seventeen operating systems, with separate forms of outstanding securities.

3. Many of the companies have fixed assets with no corresponding earnings; many are not earning their fixed charges; others are barely meeting operating expenses; while still others are operating at a steadily increasing loss. Thousands of various classes of security holders would have to be consulted and their consent secured.

4. Taken in their entirety they are not earning within $2,465,792 of their fixed charges for the year ended June 30, 1927, and their funded debt exceeds the value on an original cost basis of their physical assets by $60,295,000.

5. Inclusion of the surface car lines is not necessary to or an integral part of the plan. Their inclusion in any plan would inevitably spell the deathknell of the 5-cent fare, and unnecessarily so. If that were its deliberate purpose it could not be more effectively accomplished.

Although the surface car lines carry 35.3 per cent of the total city passengers, the growth and development of the city involves only the unification of the rapid transit lines, the extension of the transit facilities on them into the new sections of the city and the increase of rapid transit facilities to ameliorate the present intolerable congestion and service.

The continued operation of the surface lines is, at least for the present, essential to take care of the short hauls and as feeders to the rapid transit lines, except to the extent they may be replaced by buses and subway extensions. There is, however, no reason why the city should assume the burden of their increasing difficulties of operation due to traffic congestion and other causes, if it were financially able to do so, which it is not, or why it should take over the burdens of the steadily increasing losses, nor the uncertain risks of further losses from new competition from buses and additional subways. This is precisely the psychological moment not to take over the surface car lines, when we do not know and have no means of estimating the effect of bus operation. If it should hereafter be found desirable to include the surface lines in a more comprehensive plan and their owners can agree on a reasonable price, there is no reason why that proposition should not receive independent consideration on its merits. It is not practicable at this time.

The elevated roads are equally essential to the rapid transit system of the city. Of the 1,807,000,000 passengers carried by the rapid transit lines, the elevated lines carried 628,000,000 in 1927. The city cannot do without these facilities at this time nor until more subways are built to take their place.

Operating Statistics

In his report Mr. Untermyer gives many detailed statistics regarding the properties. The following have been selected as showing the magnitude of the proposition and the relative sizes of the various elements involved:

Total Route Mileage, June 30, 1926

Subway	116
Elevated	96
Surface	516
	728

Authorized and Contemplated Mileage

Subways	63
Total	791

Revenue Passengers, Based on Fares as of Jan. 30, 1925, 1926, 1927

	1925	1926	1927
Subways	1,074,000,000	1,147,000,000	1,202,000,000
Elevated	607,000,000	605,000,000	628,000,000
Surface	1,013,000,000	997,000,000	1,001,000,000
Total	2,694,000,000	2,749,000,000	2,831,000,000

Valuation on Original Cost Basis, June 30, 1926

Subways	$560,000,000
Elevated	180,000,000
New City Subway (est.)	643,645,000
Total	$1,384,422,000

Valuation on Reproduction Less Depreciation Basis

Subways	$943,440,000
Elevated	221,155,000
New City Subway	643,645,000
Total	$1,808,240,000

Book Value as of June 30, 1926, Before Depreciation

Subways	$574,137,000
Elevated	253,662,000
Total	$827,799,000

Value of Surface Car Lines

Original cost basis	$131,857,000
Reproduction cost basis	188,161,000
Book value	252,557,000

Funded Debt, June 30, 1927

I.R.T.	$209,000,000
Manhattan Railway	105,206,000
City Contracts 1 and 2	57,092,000
N.Y.R.T. Corp.	114,132,000
City Contracts 3 and 4 and balances on Contracts 1 and 2	254,015,000
City Contract (New Subway)	69,503,000
Total rapid transit	$809,870,000
Surface car lines	204,592,000

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GROSS INCOME

	1926	1927
Rapid Transit	$34,048,000	$34,153,000
Surface Car Lines	7,851,000	7,581,000

NET EARNINGS AND LOSSES—ALL PROPERTIES

	1925	1926	1927
I.R.T., Subways	$4,188,000	$6,395,000	$6,289,000
I.R.T., Manhattan Div.	4,534,000D	4,126,000D	4,909,000D
N.Y.R.T. Corp.	3,861,000	4,684,000	5,484,000
Total Rapid Transit	$3,515,000	$6,953,000	$6,864,000
City, approximate	10,500,000D	11,100,000D	13,600,000D
Total Rapid Transit	$6,985,000D	$4,147,000D	$6,663,000D
Surface Lines	2,066,000D	2,072,000D	2,466,000D
Total on transit system	$9,051,000D	$6,219,000D	$9,102,000D

D indicates loss or deficit.

Text of Statute—P.S.C. Sec. 106

THE procedure recommended by Mr. Untermyer is based on the statute known as the Public Service Commission law, section 106. Since some knowledge of the statute is essential to an understanding of the situation, the principal points included in it are given very briefly below.

The Transit Commission after making the necessary studies and investigation shall prepare a plan of readjustment for the relief of the emergency which is hereby declared to exist, and for the improvement of transit in such city. Such a plan shall contain provisions which in the judgment of the commission will accomplish as nearly as may be the following purposes: (1) The combination, rehabilitation, improvement and extension of existing railroads so that service thereon may be increased and improved to the fullest extent possible; (2) the receipt as soon as practicable by the city of sufficient returns from the operation of the railroads so that the corporate stock or bonds issued by the city for the construction of rapid transit railroads may be exempt in computing the debt-incurring power of the city and (3) the assuring to the people of the city the continued operation of the railroads at the present or lowest possible fares consistent with the just valuations of the railroads and their safe and economical operation. . . . It shall consider the incorporation in the plan of provisions whereby the title to such railroads as are not already owned by the city and whose ownership thereby is deemed by the commission to be desirable may be vested in the city in return for a lease of such railroads by the city. . . . The commission shall cause a valuation to be made of the property, other than franchise or going value, necessarily used in public service of the railroads included in the plan. . . . . The commission shall consider the incorporation in the contracts to be entered into to carry such plan into effect of provision for a board of control to have supervision and control over the management and operation of the railroads included in the plan . . . . to be known and designated as the Board of Transit Control, with authority to issue securities, etc. . . . .

Simultaneously with the above, Major C. E. Smith, consulting engineer, St. Louis, conducted a study of two problems on the transit situation for City Comptroller C. W. Berry of New York City. The two problems as submitted were:

QUESTIONS ASKED BY COMPTROLLER BERRY

1. What can be done with the old subway lines plus the possible utilization of such parts of the new construction as may be available to afford transit relief to the traveling public while the entire system is being completed?

Such relief to be either temporary or permanent or a combination of both. Correction of present conditions in the shortest possible time being the principal factor.

2. Is the plan that has been proposed and presented to this new administration the best one for the entire city? Will the proposed system upon completion provide, as far as our transit experience and available expert engineering knowledge can make humanly possible, the maximum in the way of modern rapid transit facilities for our ever-expanding municipality?

How is this great undertaking to be paid for?

How is the system to be operated, and by whom, when it is completed?

The answers to these questions, together with three brief appendices, form a 95-page volume as submitted to Comptroller Berry. Only the principal points are included in the digest which follows:

The Smith Report

ALL New York transit systems should be merged and all operated as a single unified system by the present rapid transit companies, the latter to be merged eventually into a single company. This transit system should be made self-supporting, partly by fares which should fluctuate up and down with variations in the cost of service and partly by a tax on the special benefits to particular property resulting from rapid transit construction and not subsidized by the general taxpayer. Better service can be provided with higher fares, and ample subways can be provided for comfortable transit at a reasonable fare.

Elevated and surface lines are not obsolete nor inherently losing ventures. Their lack of profits is due to the competition of the city-owned subsidized subways. The old elevated railways must be tolerated until a great deal more money is available and, in the meantime, their revenues should permit them to give good service.

Motor buses to handle all surface traffic would number more than fifteen times the Fifth Avenue buses at an increased cost of many millions of dollars in fares and would introduce serious traffic congestion.

Recapture of city-owned rapid transit lines would present complicated legal, operating and financial problems, and either disrupt present routes and require more fares to be paid or possibly increase fares on the company lines. The recaptured lines would only handle 25 per cent of the present rapid transit traffic. The independent city system of subways now under construction is much more expensive than necessary to give transit relief.

PRIVATE OPERATION DEEMED BEST

The best results for New York transportation will be secured by private operation, state regulation of service, methods and practices and city control over constitution, franchises, contracts and general policy. In every transportation system there are so-called "cream" lines that yield the profits which support the so-called "lean" lines. Yet the latter are very necessary. It would not be an accomplishment to separate the lines in order to secure a system of profitable lines if by so doing the "lean" lines would have greater difficulty in giving satisfactory service.

The subways are so congested that the companies do not now need any increase in fares so long as the people accept the present quality of service and the city makes the taxpayers pay the fixed charges on the city's investment. The cost of a ride on the subways is 5 cents, plus the city's tax exemption, plus the carrying charges on the city's investment. If the subways had paid the same amount of taxes per passenger as the Manhattan Elevated Railway and also the city's carrying charges, the fare on the I.R.T. subways for nine years, 1919-1927, inclusive, would have averaged 6.143 cents. This average fare on the Manhattan Elevated and the surface lines will secure improved service and relieve the companies from unfair financial troubles.

PROPOSED PLAN OF JOINT OPERATION

The best solution of the transit problem is by an agreement between the two operating companies and the city that the present lines will be operated as one in the interests of the best service to the public, the earings pooled, the fares fixed to meet the entire cost of service, including the city's interest and sinking fund charges, and new subways to be merged into the present system, the plans changed so as to provide for the necessary additions to form a comprehensive system instead of the proposed competitive system now under way.

No other charges would be necessary—no financial mergers, no swapping of securities, no issue of city bonds

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for recapture or purchase, except for the purpose of reducing the annual charges. Each company would operate its own lines and jointly operate new lines or reach agreements as to their operation. There is no doubt that before many years one company would be dominant in control, a consummation devoutly to be wished.

Changes in the dual contracts are proposed as follows:

A portion of the N.Y.R.T. (B.-M.T.) return of $3,500,000 per year and an additional amount if necessary to be agreed to as payment for the amortization of the "existing railroads" at an agreed valuation.

A portion of the I.R.T. return of $6,335,000 per year and an additional amount if necessary to be agreed to as payment for the amortization of the "existing railroads" (Contract No. 1 and No. 2 subways) at an agreed valuation.

The 7 per cent on $60,000,000 stocks and Manhattan Elevated preferential of $1,589,348 to be replaced by 5 per cent on $60,000,000 and an agreed annual charge for the amortization of the Manhattan Elevated system at an agreed valuation.

Each surface line or other company taken in to receive an agreed annual payment for return and amortization of its property at an agreed valuation.

In exchange for assurance of return and amortization payments each company to vest title to its property and franchises in the city at the execution of the contract, complete ownership to pass on completion of amortization.

The city's return under Contract No. 3 to be reduced from 8.76 per cent to its actual interest and sinking fund charges, the same as in Contract No. 4.

The accumulated deficits of the city under Contracts No. 3 and No. 4 and of the Manhattan Elevated under the certificates to be canceled. The accumulated deficits of the I.R.T. and N.Y.R.T. to be funded and amortized within a reasonable period of time.

All net revenues of the companies to be pooled and used to pay all company and city charges. All surplus to go into a surplus fund under the control of city and company.

Rapid transit lines of each company to be open free to passengers of other companies to all intersecting points.

Such transfer charges to be made between rapid transit lines and feeder surface and bus lines as determined from time to time.

A fare of 7 cents cash, four rides for 25 cents to be effective on execution of contract by each company.

Fares to be raised or lowered from time to time according to the state of the surplus fund.

Instead of 50-50 division of net profits as heretofore, the total operating cost per car-mile to be allowed in advance each year and after adjustments for unforeseen changes in price and wage levels, the companies' efficiency in keeping operating costs below the allowance to be rewarded about as follows: One-third to surplus fund, one-third to company, one-third to operating personnel.

Provision that future construction and equipment be paid for by the city or company as agreed in each case.

Provision that city bonds may be exchanged for company securities under appropriate conditions.

The Transit Commission to be continued for the regulation of service and practices of the company.

The chairman of the Transit Commission, the City Comptroller and an appointee of the company to constitute a board of control to fix fares, operating allowances, bonuses and certain other questions, the companies and the city to have the right to request arbitration of disputed questions.

The City Comptroller to organize a transit accounting force to check and supervise cost of service and to assist him in exercising his jurisdiction under the contract.

City and companies to secure enabling legislation for constitutional amendment to prevent amendment of contracts by a statutory body.

The city to have the right to issue bonds and pay the companies the amounts required under recapture provisions of the dual contracts.

The city to have the privilege of carrying all or any part of fixed charges by taxes on the increase in property values due to transit.

The city and the commission to appoint a conference committee to work out amendments to the contracts as outlined above and to negotiate with the companies.

Dual Contracts Nos. 3 and 4

Contracts Nos. 3 and 4 with the city, under which the I.R.T. and B.-M.T. subways are operated, were prepared carefully in the city's interest. They attracted a large amount of private capital in 1913 and since at more favorable rates than any other capital has been obtained for public utilities in the United States. The first money invested in the subways built under these contracts earns 6 per cent for the companies and, allowing $\frac{5}{8}$ per cent for amortization during the life of the contract, the net return is $5\frac{3}{8}$ per cent. On money for additions the companies get actual interest plus 1 per cent for amortization until paid for, when the additions belong to the city, thus giving a net of about $5\frac{1}{2}$ per cent. This compares with an average of about 6 per cent on $400,000,000 in the money invested in transit systems in five other American cities.

The only criticism of the dual contracts worthy of serious consideration relates to the fixed preferentials of the original or then (1913) "existing" railroads, $6,335,000 per year to the I.R.T. in place of the earnings on the original subway, and $3,500,000 to the N.Y.R.T. in place of the net earnings on the former Brooklyn elevated and rapid transit lines. These were calculated as the average net earnings of the respective companies for 1910 and 1911. In agreeing to accept the preferentials, the companies gave up prospects of large amounts of money. These earnings were necessary to support the new subways during the development of new traffic.

It is the opinion of Mr. Smith that the rate of return on a fair value of the properties would exceed the returns to which the companies are entitled under Contracts No. 3 and No. 4 and that their property is held under these contracts on a very favorable basis to the public. It seems clear that if the rule of reasonable returns on a fair value be applied to these properties, the financial returns to the companies would be greater than those which are provided in the contracts.

Elevated Systems Not Losing Traffic

Contrary to general impressions, business is not leaving the elevated railways in favor of the subways. The rate of increase has not been so fast as that of subway traffic, but it must be remembered that the elevated lines were thought to be saturated when the subways were started. In 1912 the elevated lines carried 304,270,841 passengers, in 1927 they carried 359,019,660 passengers. The elevated system is a going concern. Its service can be improved and its capacity further enlarged by modern, commodious cars. But this cannot be done on a 5-cent fare.

It would take a billion dollars, according to the cost of the new city subways per passenger, to replace the existing elevated lines as passenger carriers based on Board of Transportation traffic estimates for conditions in 1940.

Had the elevated fares per passenger equaled the cost on the I.R.T. subways the net earnings for the last nine years, capitalized at 6 per cent, amount to $136,821,300 as compared with $152,536,574 existing bonds and stocks.

Surface Lines Still Useful

The surface lines continue to be the neighborhood convenience and necessity. Last year 997,251,460 fares were collected and this slight decrease from the peak of 1924 is not indicative of a permanent falling off. These lines take in about $50,000,000 and spend about $40,000,000. There has been an increase of 50 per cent in surface car passengers during the development of the subway traffic.

In 1926 the bureau of valuation of the commission showed the following for the surface lines:

Original cost	$159,762,000
Reproduction cost	327,428,000
Cost of condition	12,440,000
Depreciation (1926 prices)	114,392,000
The total capital of the companies amounts to	
Bonds	158,532,588
Stocks	85,322,213
Total	$244,054,801

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All the surface line companies protested these commission figures as not including all elements of value. These figures show that at a fare, say 7 cents, four rides for 25 cents, the surface lines would be reasonably self-supporting. Earnings would increase and costs decrease were the lines to modernize.

The ghastliest joke on the street and electric railway industry in America, in which about six billion dollars are invested, is the impression created on the financial interests by the street cars that are operated in lower Broadway through the heart of the financial district. They are old and out of date, noisy, slow to get started and don't run fast when they do, expensive to operate, and subject to frequent failures and push-ins. The electric railway interests could well have afforded to get control of this company, equip it with the best and show what a surface line can do even in congested Manhattan.

In lower Manhattan and on certain narrow streets surface lines could not be operated because of traffic congestion. On wider streets, where there is heavier street car travel, surface lines expedite more people than they delay and carry more people with less use of the streets than any other vehicle. If street cars were abandoned and buses used there would be added the finishing touch to New York's traffic congestion.

The underlying leases that have been criticised for so many years have practically all been lowered or abolished. Receiverships and disintegration have accomplished what the companies found it difficult to accomplish. No leases remain that are subject to honest criticism. Beginning with the receiverships and disintegration of the Metropolitan Street Railways in 1907, the receiverships of the New York Railways and the Brooklyn lines in 1919 and various reorganizations, these leases were wiped out. The sole remaining lease of any importance is the I.R.T. lease of the Manhattan Elevated and this rental has been lowered from 7 to 5 per cent.

Motor Buses Unsuitable

Motor buses cannot supersede the street cars in handling all surface traffic without a great increase in cost that may be estimated at $25,000,000 to $40,000,000 a year and worse interference with other traffic than street cars. For example, it would take more than five times the Fifth Avenue buses to handle only the Third Avenue street car passengers. At 10 cents the extra cost for this traffic would be $13,000,000.

For crosstown use in narrow streets where the lines of traffic are frequently diverted and also as feeders to surface and rapid transit lines there is a wide field for buses in New York. But there is no place for them in competition with the surface lines because they cripple the service of the surface lines and ultimately stop them without being able to handle all the traffic as well, nor as economically, nor as speedily. Where they are needed they should be co-ordinated with present lines.

Rapid Transit Company Earnings for Pooling

For three years the companies have earned more than their charges under Contracts Nos. 3 and 4 as follows:

	I.R.T.	N.Y.R.T.	Total
1925	$725,230	$678,239	$1,403,469
1926	3,078,514	826,336	3,904,850
1927	2,669,895	2,128,282	4,798,177

Had there been no accumulated deficits these amounts would have peen paid the city. But they were applied to reduce the companies' deficits, which were as follows June 30, 1927:

I.R.T.	$2,771,396
N.Y.R.T.	14,192,706

These deficits do not include certain items and claims of the companies. The I.R.T. deficit will probably be wiped out in a few years, but that does not mean the city will receive any rental as the company is behind with depreciation and there is deferred maintenance. The same is true, but in greater measure, of the N.Y.R.T. The net earnings of both companies will be decreased by the competition of the new city subways.

The recapture of the city-owned lines in Contracts Nos. 3 and 4 without the purchase of the remaining lines of each system would present serious problems of disruption of present routes and service or joint operation. The recapture provisions are chiefly of value in definitely fixing the basis on which the city shall pay for the companies' investment in the event of purchase by the city.

If the city recaptures the rapid transit lines it will have to pay the cost of the companies' original contribution to construction and the cost of equipment plus 15 per cent, and lower percentages on additions less 1/39th each year after the tenth year, notwithstanding the companies have already received in large amounts sinking fund installments. Thus the city would pay about 25 per cent more than it is obligated to pay out of fares if the companies continue to operate the lines. The amount the city must pay is decreasing about $4,000,000 per year, which represents the increase in the city's equity under the dual contracts.

The annual charges received by the companies are definite and run until the end of the contracts, about 1968 or 1969. Assuming 1968 as the end, the companies would receive a total of $432,000,000. If the city recaptures the lines in 1927 and issues 50-year bonds at 5 per cent and the charges ran for 50 years it would aggregate a cost of $449,000,000.

In the event of recapture there would be four operating systems instead of three. This would give higher fares in going about the city. There would be discontinuity in the systems, making for difficulty with passengers and controlling bodies. Legal difficulties are also found in any attempt to apply the recapture clauses.

After recapture of city-owned lines of the B.-M.T. and East Side I.R.T. the city would have for subsidized operation lines handling about 700,000,000 passengers a year, 25 per cent of the traffic, carried partly by taxation and tax exemption and partly by fares. The several companies, including the surface lines, would have for self-supporting operation lines handling about 2,100,000,000 passengers a year, 75 per cent of the traffic. They would have great difficulty in giving service in competition with city subsidized subways operating with a fixed 5-cent fare.

Thus, recapture touches but 25 per cent of the transportation problem.

Free Rides Given in El Paso

DETAILS of the chartering of the El Paso Electric Railway for 1¾ hours on May 27 last are given in the company's brief filed in connection with the 1927 Coffin Prize. The chartering company was the Popular Dry Goods Company, which, in May of this year, celebrated its 25th year in business by a special sale. In the opinion of the management of this store, there could be no better accompaniment for such an event than to give the public an opportunity to ride free to its store between the hours of 8:15 and 10 a.m. Between these hours the fare box openings on the El Paso cars were closed with wooden plugs and the railway operators courteously informed all passengers that they were riding free, as guests of the Popular Dry Goods Company. At the store tickets were given away, available on the car lines for a return trip up to 7 p.m. of the same day. During the hour and 45 minutes in the morning mentioned two other car lines which usually do not pass this dry goods store were routed by it. The fact that the dry goods company would provide these rides was well advertised by it in advance.

A check of inbound passengers on all lines during these hours was made and found to result in 4,296 adults and 858 half fares. These were billed to the merchant at regular rates. The number carried was about 2,781 above normal during those hours.

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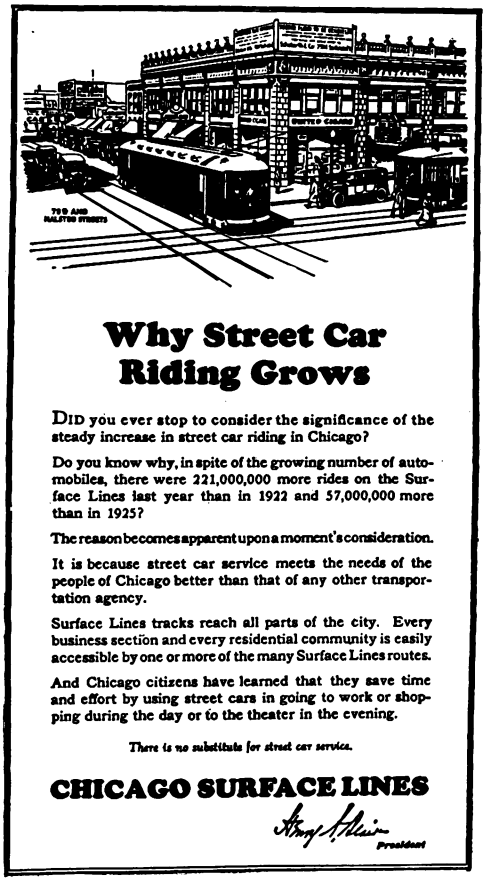
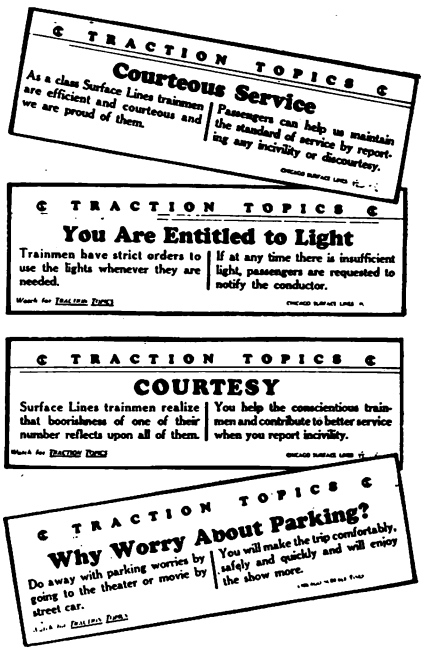
Improved Service Builds Business

in Chicago

Chicago Surface Lines continues to increase revenue and reduce costs with better cars on smooth track, closer schedule supervision and higher standard of maintenance. Increased revenue and reduced cost are shown in company's Coffin Award brief





Car cards and newspaper ads used by Chicago Surface Lines

At the left are shown ride building ceiling cards used in Chicago cars.

The advertisement in the center is newspaper copy used by the Chicago Surface Lines to tell its story directly and frankly.

As shown at the right, passenger good will is the objective of these brief talks with the rider, carried on ceiling cards in the car.

FAILURE of various attempts to reach a franchise settlement have not deterred the Chicago Surface Lines from continuing its program of service improvement, started a number of years ago in the face of the then expiring franchises under which the properties operated. Since February, 1927, operations have been carried on under temporary grants while awaiting permanent settlement. Despite this situation there has been no let-up in the program of providing better, faster and more regular service, a higher standard of maintenance for cars and track, better trained employees—in short, better transportation.

The management has continued to have faith in the power of its demonstration of sincerity ultimately to win an equitable franchise settlement that will be fair both to the community and the company's investors. There is, however, no altruism in this program. It has continued to prove itself good business. Service improvement, on the one hand, has brought steadily increased revenues, while higher standards of maintenance and greater operating efficiency have resulted in large savings in cost. A policy of rigid insistence on employee efficiency, combined with square dealing, has won the loyalty and support of the largest and most powerful union organization in the industry, which even in the midst of wage negotiations recently went out of its way to defend the Chicago transportation companies against unwarranted attack by other trades unions in the city.

Something of the spirit and point of view that have actuated these companies was outlined in the ELECTRIC RAILWAY JOURNAL of April 26, 1926, page 708. The

Year Ended Jan. 31	Revenue Passengers	Per Cent Increase
1923	762,629,211	...
1924	824,850,103	8.16
1925	830,151,540	0.64
1926	842,201,453	1.45
1927	876,249,663	4.04

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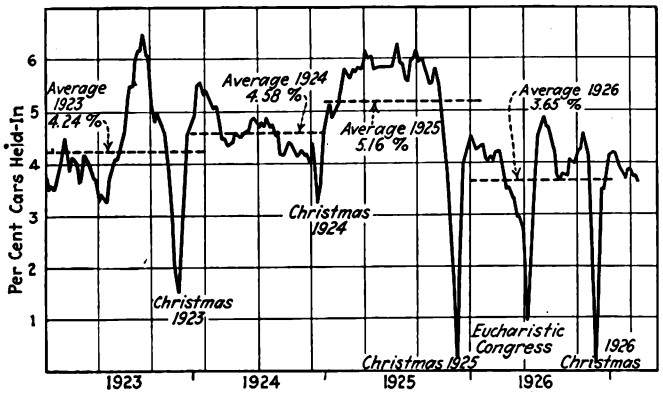

Co-operation between the shops and transportation departments permits maximum utilization of equipment during holiday peak season

results which have followed testify vividly to the wisdom of the company's policy as shown in the tabulation on page 819.

Annual gross earnings in five years increased from $56,103,061 to $61,173,601, or 9.04 per cent. During 4½ months of the year ended Jan. 31, 1923, with which comparison is made, there was an 8-cent fare in effect, which was subsequently reduced to 7 cents. From 1923 to 1927 private automobiles increased 84 per cent and the operations of an independent bus company were widely extended. Again, while the gross earnings increased 4.06 per cent in 1926, operating costs rose 2.07 per cent, but residue or net receipts were increased 9.41 per cent, thus showing a material increase in efficiency. It is also significant that the average speed maintained on surface cars during 24 hours for the entire system rose from 10.73 m.p.h. in 1921 to 10.92 m.p.h. in 1924 and 11.18 m.p.h. in 1927. Still further light is thrown on the results accomplished by the fact that the number of car-miles operated has increased from 122,161,073 in 1923 to 132,451,712 in 1926, an increase of 8.42 per cent.

Operating ratios, including 8 per cent of gross earnings allotted for renewals and depreciation and exclusive of taxes, show a steady decrease as follows:

Years	Operating Ratio, Per Cent
1924	75.17
1925	74.11
1926	72.70

Without depreciation the 1926 ratio was 64.75 per cent, this being 5.17 per cent lower than the average for 42 principal companies throughout the country.

Modern Cars Purchased from Renewal Fund

New cars to the number of 445 were added to the system during the last three years. This was done, despite inability to obtain capital because of the franchise situation, by use of the reserves set aside for renewals. All of the 445 units are equipped with pneumatically operated doors. Two hundred and forty-five of the cars have automatic exit doors. Low steps and wide platforms to speed up the movement of passengers are other features of Chicago rolling stock. Fifteen inches is the maximum height for the first step and the platform width permits three persons to board and alight at the same time.

Included in the car program was an articulated unit, built in 1925 from two old double-truck cars. This was an experiment. The costs of construction, coupled with the result of tests, influenced the management against further construction along this line. There has been expended for new car equipment and extensions a total of $7,848,000.

During the time that this new equipment was being purchased existing cars on the system were overhauled into first-class condition. In 1923 a progressive overhaul and repair schedule was set up. At first the basis of overhaul was three to four years. Beginning with 1925, however, this was changed, so that since that time every

Financial Summary of the Chicago Surface Lines for the Fiscal Years ended Jan. 31, from 1922 to 1927, Shows the Steady Increase in Riding and the Increased Operating Efficiency Resulting from the Management's Progressive Policies

	1927	1926	1925	1924	1923	1922
Passenger revenue	$60,436,705.93	$58,076,487.22	$57,284,602.06	$56,986,687.82	$55,495,310.69	$59,706,412.72
Other revenue	736,895.27	709,393.51	797,076.14	668,481.91	607,751.24	637,320.47
Gross earnings	$61,173,601.20	$58,785,880.73	$58,081,678.20	$57,655,169.73	$56,103,061.93	$60,343,733.19
	7-cent fare	7-cent fare	7-cent fare	7-cent fare	Fare 8-cent to 6-14-24 7-cent thereafter	8-cent fare
Operating Expenses:						
Way and structures	$2,984,484.50	$2,830,649.58	$2,859,869.95	$2,682,066.36	$2,556,627.18	$3,040,939.66
Equipment	4,188,633.15	3,984,635.24	4,148,282.10	3,858,865.16	3,788,170.59	4,348,372.65
Renewals	4,893,888.08	4,702,870.47	4,646,534.24	4,612,413.59	4,488,244.96	4,827,498.67
Power-maintenance	386,086.82	394,620.73	376,062.63	361,955.71	316,449.77	320,375.52
Power-operation	3,638,283.15	3,465,460.05	3,466,857.30	3,321,683.08	3,175,390.97	3,128,792.32
Conducting transportation—trainmen	21,485,750.20	20,741,205.68	20,890,865.98	19,640,721.02	19,662,636.31	21,574,699.34
Conducting transportation—other	3,214,031.29	3,172,423.05	3,177,461.10	3,030,582.88	2,912,780.47	3,208,603.47
Traffic	123,433.08	109,973.48	102,793.44	44,208.18	42,092.79	34,546.97
General and miscellaneou—damages	1,936,202.48	2,469,007.01	2,439,430.49	2,421,517.13	2,356,328.59	2,271,224.06
General and miscellaneou—other	1,620,696.77	1,697,361.31	1,551,803.24	1,695,740.04	1,859,348.09	1,568,097.52
Total operating expenses	$44,471,489.52	$43,568,206.60	$43,659,960.47	$41,669,753.15	$41,158,069.72	$44,323,150.18
Balance	$16,702,111.68	$15,217,674.13	$14,421,717.73	$15,985,416.58	$14,944,992.21	$16,020,583.01
Taxes	$3,400,000.00	$3,060,000.00	$2,915,000.00	$3,170,000.00	$3,258,000.00	$2,193,000.00
Residue receipts	13,302,111.68	12,157,674.13	11,506,717.73	12,815,416.58	11,686,992.21	13,827,583.01
Operating ratio (exclu ing taxes), per cent	72.70	74.11	75.17	72.27	73.36	73.45
Miles single track operated	1,008	1,003	997	993	993	993
Average maximum number cars operated (week days only)	3,367	3,234	3,209	3,134	2,982	2,982
Revenue passengers carried	876,249,663	842,201,463	830,151,540	824,850,103	762,629,211	750,515,622
Transfer passengers carried	651,224,394	626,365,104	616,552,684	600,848,554	557,331,999	547,522,102
Free passengers carried	47,495,845	48,944,104	46,023,318	41,645,629	38,801,339	35,724,685
Total rides	1,574,969,902	1,517,510,661	1,492,727,542	1,467,344,286	1,358,762,549	1,333,762,409
Revenue car-miles operated	132,451,712	128,398,420	127,213,599	122,161,073	116,131,909	118,446,044
Revenue car-hours (paid for)	14,788,514	14,269,909	14,381,497	13,899,147	13,186,984	13,548,089
Passenger revenue per revenue car-mile, cents	45.63	45.23	45.03	46.65	47.79	50.41
Passenger revenue per revenue car-hour	$4.09	$4.07	$3.98	$4.10	$4.21	$4.41
Operating expenses per revenue car-mile, cents	33.58	33.93	34.32	34.11	35.14	37.42
Operating expenses per revenue car-hour	$3.01	$3.05	$3.04	$3.00	$3.12	$3.27

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car goes through the shops every two years, with the following result:

Year	No. of Cars Overhauled	Average Cost of Overhauling	Miles Operated Per Car Overhauled
1922	822	851.93	140,800
1923	803	761.14	150,900
1924	1,000	832.21	126,820
1925	1,467	461.40	87,300
1926	1,517	457.97	87,200

These figures forcibly reveal the economy of a high standard of maintenance. It is a short story: Number of cars overhauled almost doubled, cost reduced almost one-half. To this should be added the figures for the routine maintenance costs, which speak for themselves. In 1922 it cost $3.28 per 1,000 car-miles for equipment maintenance, as compared with $3.13 in 1926.

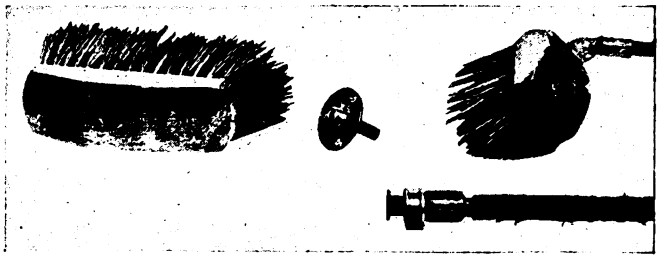
In judging these figures it should be remembered that a wage scale as high as any in effect anywhere in the industry is paid in Chicago. Under this scale repairmen are paid 75 cents per hour, carpenters 64 to 90 cents, machinists $1 to $1.05, machinist helpers 70 to 75 cents, shop controllermen and car wiremen $1 and other trades on a comparable level. These high rates, have, however, been offset by increased efficiency, which is partly shown by the following tabulations:

Year	No. of Carhouse Employees	Car-Miles Per Year Per Man	Cars Per Man
1922	1,258	91,924	2.54
1926	1,325	99,908	2.69

Year	Employees Shop and Equipment Department	Employees Per 100,000 Miles Operated
1922	2,238	1.93
1923	2,405*	1.98
1924	2,484*	1.95
1925	2,343*	1.83
1926	2,304	1.74

*Men employed solely on new car construction are included.

Included in the general plan of overhauling all cars of the system have been painted, the color scheme being para red set off by cream-colored posts, a decided change for the better from the old standard dark green bodies and cherry posts of the period prior to 1920. In addition to this, the Chicago Surface Lines believes in daily and weekly housecleaning. Every day the cars are swept, floors and interiors are disinfected and curtain moldings and lights are thoroughly cleaned. On the present washing schedule, 4,870 cars are thoroughly washed per week. Since the total number of cars on the system is 3,639, this schedule puts the cars through on an average of more than once per week. Compressed air is used to clean



Fountain brushes are used to wash Chicago cars thoroughly and quickly

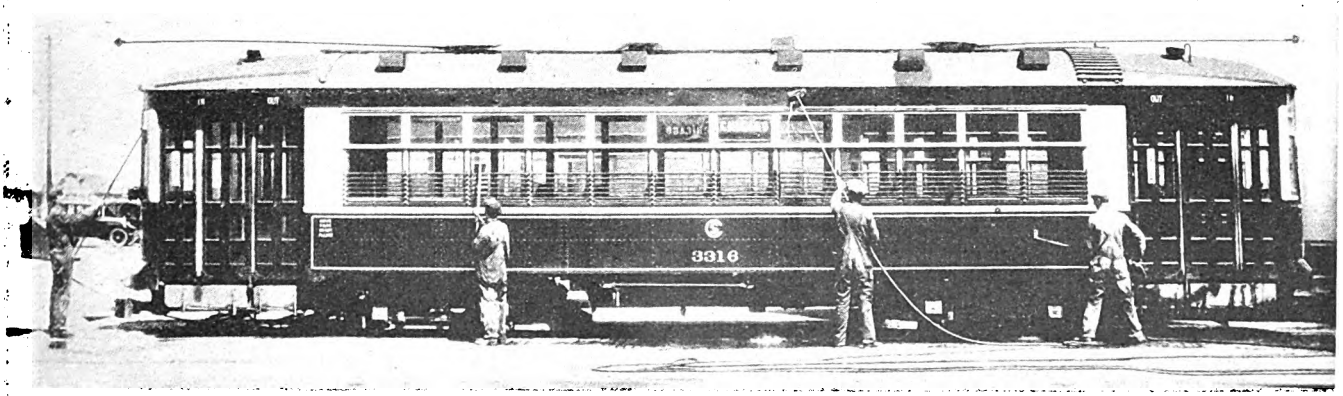
heaters, sign boxes and curtains. All interior woodwork, floors and seats are scrubbed.

Pull-ins, which are a serious handicap in providing speedy and reliable service, have been effectively reduced on the Chicago system by intensive work and co-operation between the transportation and equipment departments. In 1926 the car-miles per pull-in were 14,839, compared with 7,100 in 1925. This represents an improvement of 103 per cent in twelve months. To this record may be added the fact that the mileage operated by the system during 1926 averaged 37,445 miles per motor car on the property. Records also show that on Dec. 20 last 100 per cent of the 3,639 cars owned by the company were in operation and that on the three days succeeding there was only one car out of service.

Greater Use of Equipment

It is significant at this juncture to comment on figures for car operation for the three years ended Jan. 31, 1923, as compared with the three years ended Jan. 31, this year. The score stands: Number of cars operated as of Jan. 3, 1923, per 10,000 riders, 7.87, against 7.35 for the period ended Jan. 31, 1927. Despite this reduction of 6.6 per cent in the number of cars per 10,000 riders the percentage of passengers per car in rush hours was decreased 12 per cent by improved scheduling. By rerouting, more scientific scheduling and better maintenance, which all lead toward more efficient use of available equipment, the following estimated savings were made:

Total cars owned (prior to Nov. 1926)	3,539
Average pay time per rush-hour car, hours	8.2
Average cost that varies with car operation per car-hour	$2.50
Effective days in year	300
14.6 per cent of 3,539	517
Saving per year in operating cost	$3,170,000
Reduced investment at $20,000 per car, including storage	$10,320,000
Reduced interest on investment	$516,000
Total reduction in operating expenses and interest charges	$3,686,000



Clean cars are considered an important element in building a satisfied patronage for the Chicago Surface Lines. The 3,639 cars on the property are thoroughly washed more than once a week

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Special clips made in the company's shops are used to support two ceiling cards in each car

SCHEDULE NUMBER OF CARS CROSSING VARIOUS HEAVY INTERSECTIONS DURING THE MAXIMUM ONE-HALF HOUR IN CHICAGO

	Cars Pass
Grand, Halsted and Milwaukee Streets	269
Madison and Clark Streets	197
Halsted and Archer Streets	153
Clark and Lake Streets	145
State and Lake Streets	137
Clark and Division Streets	169

NUMBER OF CARS ONE WAY PER MAXIMUM ONE-HALF HOUR VARIOUS KEY LOCATIONS IN CHICAGO

Milwaukee Avenue, southbound, Elston Avenue to Desplaines Street	100
Clark Street, southbound, Diversey Parkway to Division Street	86
Clark Street, southbound, Center Street to Wells Street	125
Wabash Avenue, southbound, Randolph Street to Harrison Street	96

RESPONSE IN RIDERS

Year Ended	Weekday Average	Saturday Average	Sunday* Average	Total for Year
Jan. 31, 1923	2,204,425	2,356,385	1,563,911	762,629,211
Jan. 31, 1924	2,354,139	2,521,487	1,623,414	824,850,103
Jan. 31, 1925	2,373,114	2,512,121	1,614,823	830,151,540
Jan. 31, 1926	2,424,194	2,507,004	1,631,484	842,201,453
Jan. 31, 1927	2,521,897	2,668,342	1,632,844	876,249,663

*Includes holidays.

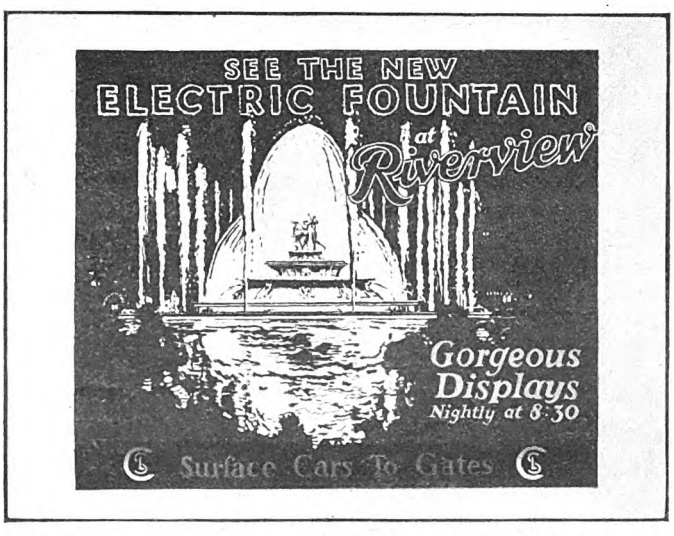
The 14.6 per cent is arrived at on the basis that to have provided the present service under the old conditions would have required 12 per cent more cars in each direction, which would be 8 per cent of all the cars operated. Further, since all cars owned were in use, an increase of 8 per cent in rush-hour equipment would have necessitated the purchase of that percentage of new rolling stock.

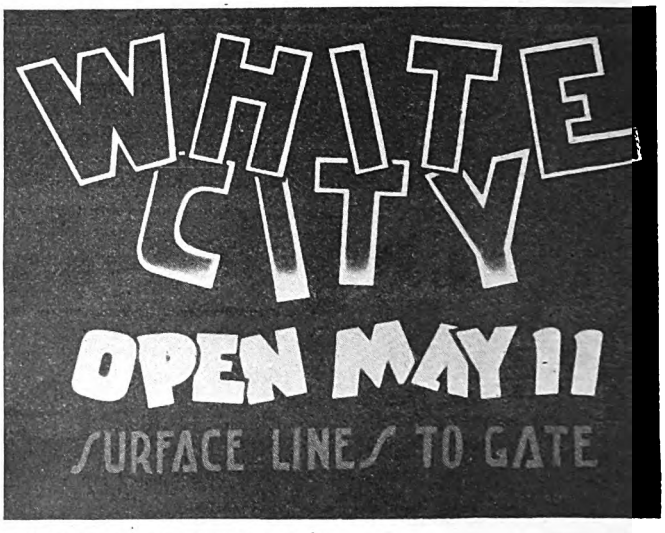
Traffic Checks Speed Service

While only 12 per cent of all rides on the system are taken within the business district, the relief from congestion in this area due to special traffic studies has had a marked effect on the system as a whole. A 10 to 30 per cent reduction in traffic obstructions was accomplished by rerouting and by the consequent elimination of 11,000 car turns per day in the Loop district. At the same time the results accomplished led the city to prohibit left-hand turns by all vehicles in the business district. A 14 per cent increase in service, an 8.42 per cent rise in revenue car-miles and a 10 per cent rise in seat-miles are some of the results. These figures when translated amount to an increase in car-miles from 122,161,073 in 1923 to 132,451,712 as of 1926, and seat-miles increased from 5,339,660,501 to 5,875,557,944. The latter is due in some respects to new cars having 52 seats each.

Success obtained by the company in improving traffic conditions in the Loop area led to co-operation by the city in the initiation of similar studies over the systems. The schedule and traffic department was increased from eleven to 40 highly trained men. New forms were drafted and closer co-operation maintained between trainmen, supervisors and civic bodies. Special checks are made by conductors to supplement the records of the schedule force. Specialists analyze terminal conditions and traffic interferences. These agent reports are compiled for office use and when combined with analyses of the operating and supervisory practices of the transportation department form the basis for revisions in running time. Schedule checkers follow up the company's operations by checking variables in running time, headway and terminal time. This work develops detailed data for transportation and supervisory forces. On certain heavy lines, where headways are close, increased service is provided by two-car trains of the multiple-unit type, operated on a carefully balanced schedule during the rush hours.

A concrete example of what has been accomplished by keeping service carefully balanced to the needs of a given line is furnished by the history of a crosstown line located on the south side. Five years ago nine two-man cars were operated on this line and the yearly revenue passengers stood at 1,939,722. It was decided that better service could be given by one-man operation (there are





Types of posters used in the ends of Chicago cars to stimulate riding

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80 one-man cars on the system, the number being restricted by state authority). Twelve cars of this type were subsequently placed in service. This reduced the headway and inversely increased the riding. Schedules were revised. More cars were added. With twenty one-man cars operating during the week from Feb. 8 to 14, 1925, 193,743 passengers were carried compared with 99,113 patrons per week transported by the nine original two-man units in service prior to April 1, 1923. Growth of population and business made it expedient to change back to two-man operation. The line was extended 1 mile last year into an undeveloped area. The net results stand at this writing: 6,766,840 revenue passengers per year, which is a 249 per cent increase over the fiscal year ended Jan. 31, 1922; average of 22 cars and 1,171,798 car-miles operated per year, representing an increase of 119 per cent.

Traffic Problem Severe

The staggering traffic problem confronting the Chicago Surface Lines may be appreciated when it is known that normally between 7 a.m. and 7 p.m. there are 570,000 rides per day into and out of the business districts provided by 17,000 cars. This represents 57.8 per cent of all passengers using surface vehicles in the area. Fifteen thousand vehicles enter or leave the business area (about ⅞ of a square mile) during the peak half hour, and 1,136 street cars must cross the district boundaries during the same period. Despite a constant increase in private vehicular traffic, the results obtained in speeding up the three main traffic arteries through the congested Loop district are indicated by the following figures:

	1924 M.P.H.	1926 M.P.H.	Increase Per Cent
Wabash Avenue	4.32	6.17	42.8
State Street	3.66	6.10	66.7
Clark Street	4.88	6.65	36.3

While analysis and revision of schedules have been largely responsible for these speed figures, there is another important factor to be mentioned, i.e., traffic direction by an expert force of company men who in the central district assist the police in moving traffic during the rush hours. These men are dressed in uniforms closely resembling those of the police. Augmenting this traffic control there is a liaison between the company traffic officers and dispatchers at the central offices which is maintained by street telephones. Further improvement of service was brought about by the company's anti-parking campaign and the subsequent regulation by the City Council, which revealed, incidentally, that automobiles had increased from 12,000 in 1910 to 341,000 in 1925. This increase brought 122,726 trips of vehicles into the central business district during a normal business day. The district is capable of accommodating only 1,157 parked vehicles at a time and there is parking room during a twelve-hour day for only 18,222 vehicles. A survey conducted by employees of various retail business concerns among 96,082 of their patrons showed that 1,505, or 1.57 per cent, came in automobiles, which parked at the curb.

As the result of sifting out the other causes of delays, parades and other pageants were ruled off certain busy streets, through the co-operation of the civic authorities. Front-end collectors, who are stationed at heavy transfer points during the peak loads, and the skip-stop system, authorized in 1918, are other contributions to speedy service.

Detroit Street Traffic Survey

Report reveals that city is less than 50 per cent efficient in the use of its streets. Only 19.1 per cent travel by private auto

DETROIT'S annual economic loss, due to traffic congestion and delay, is estimated as more than $30,000,000. Detroit, in common with all large American cities, is less than 50 per cent efficient in the use of its streets. The recognition of the need for reducing traffic hazards and the economic losses due to traffic congestion and the possibility of making more efficient use of the highways prompted the city, through the Department of Police, to make a traffic survey.

The survey, which deals principally with private automobile traffic, contains some interesting information about general vehicular travel. A table listing the mode of transportation used by customers of 27 Detroit stores over a three-day period reveals that only 19.1 per cent use private autos, while 80.9 per cent resort to the street car and motor bus. Data on private auto traffic, the 19.1 per cent, comprise the bulk of the report.

The work includes alley traffic, street parking, garage and lot parking and business district traffic flow surveys, in addition to a study of economical vehicular speed.

The division on alley parking points out many unfavorable conditions, such as absence of street numbers, parking of private automobiles, storing rubbish or construction material in alleys and obstructive truck parking.

It was shown in the section covering street parking that many violations of parking regulations were being made.

Increasing Vehicular Speed

Under the subject of "Economical Vehicular Speed" appear data on the use of automatic traffic signals and suggestions for increasing vehicular speed. The report further states: "We believe that 'rush-hour' traffic should be given special preference by keeping open for moving vehicles the full width of pavement in the direction of the greatest traffic movement. Slow-moving vehicles obstruct traffic, diminish the number of vehicles that can pass a given point in a given time and increase the amount of passing of one vehicle by another, thus adding to confusion and danger. Certain vehicles, such as heavy trucks, which inherently proceed at slow speed, are required to travel close to the curb. This requirement is fairly well observed, but fails to solve the problem of interference with free movement caused by the presence of other slow-moving vehicles.

"Street cars using the natural highest speed lane and operating on a local stop service become slow-speed vehicles and, in view of the ordinance requiring other vehicles to stop with them, have a very definite retarding action on all other vehicular movements."

It was suggested that the system of operating street cars express and buses local be given a 30-day trial on some route. It is believed by the Commissioner of Safety that such a combined service would expedite materially the flow of all types of vehicular traffic on any street where trolley cars are operated.

Diagrams showing traffic movements in the downtown district were prepared for the traffic flow survey. It is the plan to use the chart in planning platoon type signals.

The intent of the report was to point out certain con-

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ditions that exist and to suggest that those interested in a more efficient use of streets and alleys lend their assistance to that end.

The suggestions at the end of the report for bettering conditions included: Further modernization of the traffic signal system, publication of information on use of signals and streets, passing further ordinances and enforcing the present ones with respect to use of alleys and streets, prohibiting improper parking and giving the combination express-trolley car and local-bus service a trial.

In the foregoing suggestions, stress was laid on cooperative endeavor because "in the final analysis," according to the report, "regulatory statutes must depend on public support to produce quick and lasting results."

Washing Frames at Edinburgh and London

They are provided with inwardly swinging horizontal pipes so as to fit any type of car or bus. Other devices feature their design

WASHING frames for buses and cars are much more common in Europe than in the United States, despite the lower cost of labor abroad. A large railway or bus system in Europe without one or more of these washing frames is a rarity. The London General Omnibus Company has 44 garages and at least a number of them are fitted with two or three washing frames. Hence the principal interest in European washing machines is not so much in their use as in their design.

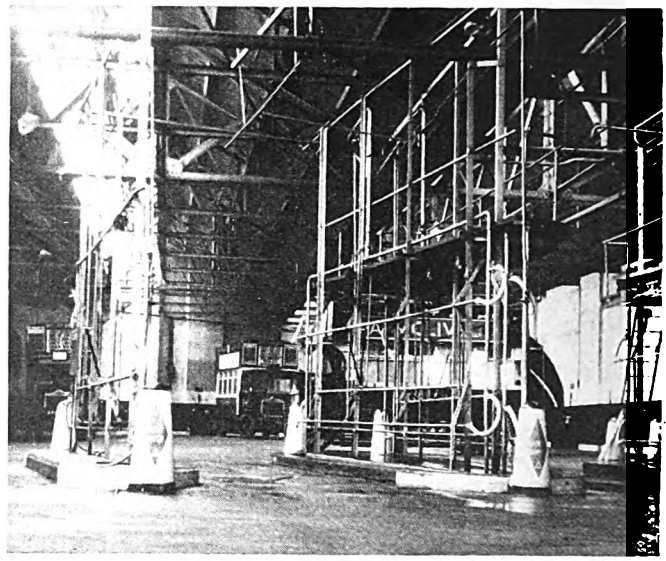
One of the accompanying illustrations shows the form used by the Edinburgh Corporation Tramways and forms part of the report at the Cleveland convention of the Engineering Association committee on motor bus garage design. A feature of this washing frame is the use of two hinged horizontal spray pipes on each side connected to the main water supply by flexible hose. These hinged spraying pipes can be swung inwardly toward the car or bus while in action, thus bringing the spray close to the sides of the vehicle. This permits the frame to be used with a great variety of equipment.

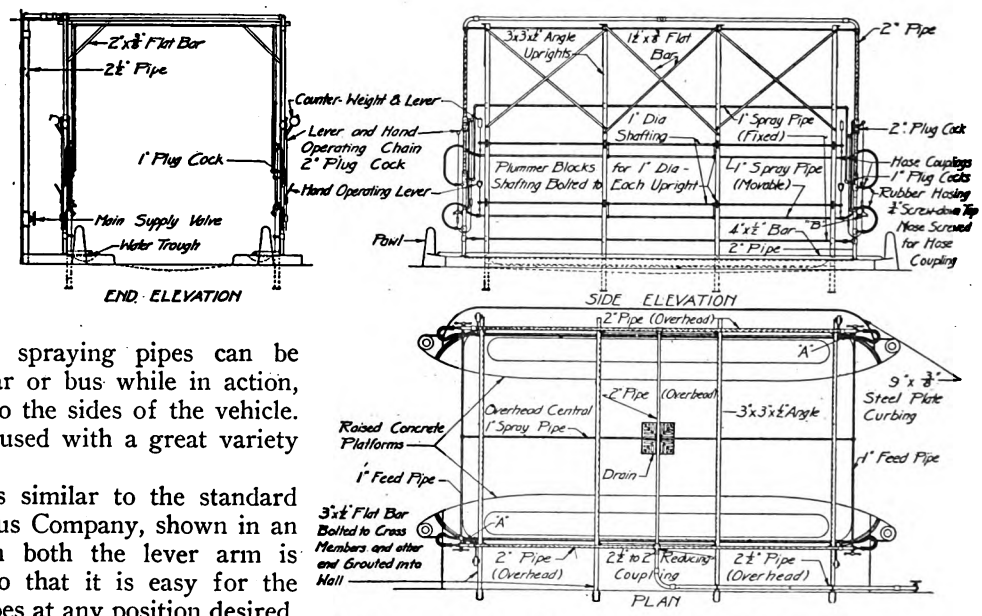
In this respect the frame is similar to the standard of the London General Omnibus Company, shown in an accompanying illustration. In both the lever arm is counterbalanced by weights, so that it is easy for the operator to set the swinging pipes at any position desired. In its use of swinging pipes the machine differs from that used for buses in Berlin and described in the issue of this paper for Sept. 3. In the Berlin example each side of the washing frame is separate and mounted on wheels. By this construction the two frames can be set at any distance apart desired and in any position. An account of still another type, that used by the Paris Surface Lines, was published on page 272 of the issue of this paper for Aug. 13, last.

The Edinburgh washing rack, to quote from the report of the committee on motor bus garage design, covers approximately 495 sq.ft. of floor space. The extreme outside length is 29 ft. and the width between inside of island curbs is 7 ft. 9 in. These islands serve as the foundation for the frame of the machine. Rounded at the ends, they contain a trough 18 in. wide by 6 in. deep, which extends the whole length of each island.

Three men are required to operate this machine, one at either side, to manipulate the spray handles, and the third at the front end, to wash the bonnet and front part of the body. The time occupied in washing a bus is four minutes, as compared with twenty minutes under the old method, and the quantity of water used per bus has been reduced from 150 gal. to 100 gal. The water pressure is approximately 100 lb. per square inch.

The London washing frame is for a double-deck bus,





British washing racks with inwardly swinging horizontal spray pipes so as to fit any width of vehicle. The line drawing is of a rack used by the Edinburgh Corporation Tramways, the half-tone engraving of one used by the London General Omnibus Company

and there is a platform near the top on which the man who washes the roof stands, using a soft brush. The ends are protected by heavy concrete ports so that accidental sidewiping or other blows from buses will not injure the piping. The water pressure used in London is from 60 to 70 lb. per square inch.

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Saving with One-Man Cars in Scranton

With completion of fifteen cars now being converted the Scranton Railway will be 100 per cent one-man equipped, with a marked reduction in operating cost

By C. G. Keen
Railway Engineer General Engineering & Management Corporation, New York

When the General Engineering & Management Corporation actively entered the street railway field early in 1925 there were numerous problems to solve, many of which have a general interest. Of major importance was the Scranton Railway, and as it was the largest property in the railway group acquired it deservedly received a large share of attention. An extensive track rebuilding program was at once inaugurated and studies were undertaken to effect savings in operating costs.

This company operated at that time about 100 passenger cars in normal daily service, over 103 miles of track, serving the city of Scranton and running to Moosic on the southwest and to Carbondale and Forest City on the northeast and including about 10 miles of track rented from the Scranton, Dunmore & Moosic Lake Railroad to Moosic Lake on the east. The entire system was run with two men per car. This seemed to be the logical place to make economies. A large part of the car equipment was obsolete, and while some cars were worth rebuilding, it was decided to purchase at once ten new light-weight, double-truck, double-end, one-man, two-man cars. A careful review of the existing equipment was made and 35 cars were selected to be rebuilt and to be furnished with safety control at once.

The new cars were carefully designed, with no thought except the comfort of the passenger and safe and economical operation. These cars were described in Electric Railway Journal of Aug. 14, 1926.

Rehabilitation of the 35 old cars in 1925 was the first half of a general plan to furnish the entire system with cars that could be operated by one man with safety so as to obtain the resultant savings. The preliminary study showed about $3,000 per year per car reduction in platform labor cost by one-man operation, assuming 52,000 car-miles run. The cost of the change would be about $1,500 per car. The work of conversion was pushed vigorously and the cars were soon on the road with full safety devices and pneumatic door engine control. Line switches were installed and general repairs made.

The savings were at once apparent and the platform costs were reduced approximately as estimated. However, because of the installation of traffic signals in the central city, the schedule speeds were slowed down and the full savings were not realized. Nevertheless the program was prosecuted with vigor and in 1926 twelve more new cars were purchased. These were identical with those bought in 1925 and were described in Electric Railway Journal of Jan. 29, 1927. Twenty more cars were rebuilt. A brief account of the changes on ten of these appeared in the Journal of Dec. 18, 1926.

With 22 new cars and 55 others converted to safety cars the average platform expense on the entire system was cut nearly 5 cents per car-mile, amounting in all to about $180,000 per year. As the total cost of new cars and rebuilding of the old ones was about $503,000, a good return was shown on the investment. In the face of generally unsatisfactory business conditions, particularly in and around Scranton, this is a very satisfactory showing and is highly important.

At present fifteen cars are going through the shops, the changes on five costing $1,500 each and on ten costing $3,500 each. The cars in the latter class need considerable overhauling, but the greatest cause of the difference in cost is elimination of multiple-unit control and the substitution of hand controllers. This latter change was decided upon because of the expense of maintaining the multiple control with no corresponding benefit, as there are no cars now operated in trains in Scranton.

With the completion of these fifteen cars the city of Scranton will be 100 per cent one-man operated. This, in view of the traffic density, is remarkable and was not thought possible by many who had studied the situation previously.

The safety features of these cars are the standard adopted for all cars operated under the management of the General Engineering & Management Corporation. They permit the greatest flexibility of operation. C. A. Brooks, manager of railways for the General Engineering & Management Corporation, has been the prime mover in all of this work and has devoted a large part of his time to obtaining the economies mentioned. H. H. Dartt, vice-president and general manager of the Scranton Railway, is in direct charge of the construction and operation of this equipment.

Freight Accounting for 25 Depots Centralized

Centralized station accounting, by a systematized plan devised and installed by C. R. Mahan, comptroller Chicago, North Shore & Milwaukee Railroad, is reported by that company to be in successful operation at the present time in the office of the auditor of freight accounts at Highland Park, Ill.

The accounting activities for the 25 freight and merchandise dispatch deposits located on the North Shore Line are now cared for by the auditor of freight accounts and a staff of 22 employees at the Highland Park office. Approximately 50,000 waybills are handled through this office each month. The use of Powers accounting machines in the compilation of station accounts has proved particularly advantageous.

According to Mr. Mahan, author of the system, the principal advantages of the centralized station accounting plan are as follows:

Station freight accounting is completely divorced from the station and consolidated in a centralized department under the jurisdiction and supervision of the auditor of freight accounts.

The station agent is relieved of considerable detail work, thereby permitting him to give more time to the solicitation of business. The new system also eliminates the factor of accounting experience when selecting new agents or other freight station employees.

It provides a more adequate accounting control over the station accounts and reduces the work of a traveling auditor approximately 65 per cent. By use of the accounting machines in handling this work the number of employees usually required is reduced, as also is the possibility of error due to the human element. In addition the machines speed up accounting work and minimize the labor cost of securing freight statistics.

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Public's State of Mind Controls Car Advertising

By J. C. Barnes

Director of Advertising New Orleans Public Service, Inc., New Orleans, La.

WITH any advertisement, or series of advertisements, concerning the operation of a public utility the character of the copy necessarily must be determined from the state of mind of the community toward the utility rendering the service. This is so even in merchandising copy. What is the feeling of the community toward the utility? Is there a just appreciation of the problems involved in the service? Or is the consciousness toward the utility merely dormant, the service being taken for granted? Or, again, is the feeling toward the utility one of open hostility? These are factors which must determine the character of the copy used in a series of institutional advertisements. Thus considerations were carefully analyzed in the preparation of this series of eleven advertisements which the New Orleans Public Service, Inc., is now running in the daily press. We had no hesitancy in departing from the beaten path of advertising rules in order to meet what we considered the needs of our local situation.

This series, as it obviously will be seen, was designed primarily to awaken a street railway consciousness in the city; to cause the public to appreciate more fully the difficulties that have to be surmounted in order to render dependable street railway service; to bring about a clear appreciation of the value of such service in the growth and development of the community. Only indirectly was there any strictly sales appeal made.

The first of the series shows the magnitude of the company serving the city with gas, electricity and a street railway. However, instead of presenting this in the form of dry statistics, we introduced the idea of a new city, Public Serviceville, La. In a state where there are comparatively few cities with a population of 20,000, the designation of a city hitherto unknown and having such a large population we felt would at once arrest attention. We have shown in this advertisement the number of employees and the amount received by these employees in salaries and pensions. But the keynote of the advertisement, the message we were striving to get over, is embodied in the paragraph, "This great Public Service family of 20,000, almost 5 per cent of the total population of the city, is united, not by bonds of kinship, but by ideals of public service, and these ideals are to give to the city of New Orleans, at all times, the highest degree of gas, street railway and electric service that it is possible to render."

Succeeding advertisements deal strictly with the street railway operation, the most important feature of which we considered dependability. We presented this first in the copy captioned, "Around the World 50 Times Without a Breakdown," and were able to show in a rather startling manner the remarkable record that our company has been able to achieve in the dependability of the service. Here we make only a casual reference to the fact that the average fare paid by street car passengers in this city is considerably less than elsewhere. And it is made not so much to encourage riding the street cars as to emphasize the importance of the record for efficiency in operation.

We considered, after dependability, the next most important factor, safety, though mindful that many critics would reverse the order, and again we were able to present the record of our company in a somewhat dramatic fashion. Methuselah, a Biblical character known to practically every individual, is shown signaling a street car. There can be little doubt that the unusual contrast of this ancient figure on a modern street would arrest attention, and it was thought that the caption would arouse sufficient curiosity to inveigle one into reading the entire story. Again, in this advertisement we have studiously avoided presenting mere dry statistics.

The advertisement which followed, captioned "The Safest Place on the Streets," tells substantially the same story as the previous copy, with the exception that it shows the difficulty of handling congestion out on the streets, and while applicable to probably every city it was conceived largely with the local situation in view.

At the time the series was prepared there was nation-wide discussion on the place of the bus in urban transportation. Copy in the advertisement, with the head "A New Service," was designed, first, to show our conception of the relationship that the bus should occupy in the transportation facilities as a whole, and, further, to apprise the community of the number and type of buses that our company has in service, which facts had not been presented adequately hitherto.

"Winning Friends for New Orleans," the next piece of copy, is strictly of the good-will type. Our company has always prided itself upon the courtesy of its car men, but we realize that local citizens think of this service as valuable only to the citizens of New Orleans. We have presented in the text another angle, which it was felt should cause a better appreciation of the value to the community of the courtesy of our car men.

While in the text of "A Forest Is Under the Track" we have had to deal to a large extent with figures, we believe that they have been handled in such a way as to be readable. This copy was written with the sole

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idea of presenting the great difficulties encountered in operating a mass system of transportation on the congested streets of a great metropolis.

Analysis of the next public talk, "Transportation Builds School Houses and Homes," reveals that we have presented a value of street railway service, realized by all street railway operators and perhaps individuals actually engaged in the real estate business, but not generally appreciated by the average individual. The copy shows, too, the amount paid in taxes, without making any reference to the fact that a municipally owned utility pays no taxes, as it was thought that any direct reference to this fact might arouse a suspicion of some political issue in the offing, and thus tend to destroy the good-will value of this statement.

Little explanation is needed in regard to the text of "The City Is Judged by the Appearance of Its Street Cars." This company has always prided itself on the appearance of its street cars, but, of course, there being no local basis for contrast, the appearance of the street cars was taken as a matter of course. It was to awaken a realization of the influence that well-kept cars have on visitors, as well as the value of attractive street cars as they affect the general appearance of the city, that this copy was prepared. It should be noted that in practically all of these advertisements we reiterate our excellent records in safety and dependability.

"You Don't Deliver Your Own Mail" is perhaps nearer directly sales copy than any other advertisement carried in the series. It was written, however, first to reveal the high percentage of individuals who use street cars as contrasted with other means of travel, and, next, to awaken a consciousness of a mass system of transportation, just as the electric system is a mass system of power, and should be so considered.

The purpose of the last of the series, which is headed "Lost in Traffic Congestion $1,500,000,000," was to apprise the community of the seriousness of traffic congestion, with the certainty that whatever should be done to relieve such congestion the street cars would be shown preference, and that whatever limitation was imposed upon the parking of automotive vehicles in the business section of the city would necessarily operate to the advantage of the street railway.

Allentown Has a Trolley "Greeter"

Employee of the Lehigh Valley Transit Company directs incoming railroad passengers to the proper cars for various destinations

HAVE you a "greeter" in your home town? Allentown has. Edward Greenawald, employed for 23 years by the Lehigh Valley Transit Company, has been given the position to welcome strangers at the two railroad stations in the town. Travelers, heretofore ignorant of the routes and destination names on the street car fronts, have been jumping in the taxicabs as the easiest thing to do. Now they ask the kind and courteous man standing there with the blue uniform and white cap which car they shall take. Thousands of dollars, the result of investigation, have been added to the coffers of the transit company since this new system has been in effect. E. C. Spring, general superintendent, said that he was skeptical at the beginning and thought that nothing short of a crew of guides could ever get people into the cars.

On his way back to the station from the offices of the company, the inquiring reporter asked Mr. Greenawald a few questions:

"What time do you start, and what are your hours?"

"I get here at 7:30 in the morning," he replied. "I meet all the principal trains on both roads. As the passengers debark, I call to their attention that such and such a car is waiting outside. It is also my duty to learn if any trains are late; when I do, I hold the trolley at the station so that no one has to wait for his car. People appreciate this service very much."

"How has the taxi trade been recently?" was another question.

"Taxis are not carrying the passengers they used to.

Edward Greenawald, Allentown "greeter," assisting street car passengers

The taxi station over there," he pointed to the plaza where the cabs parked, "used to be filled. Now you see only two or three."

Aids as Traffic Officer

Mr. Greenawald's job, however, is not only this. As representative of the transit company, he assists in keeping schedules by directing trolleys across the railroad tracks. There is always a halt to permit the conductor to cross the tracks and signal his motorman to proceed safely. With the inspector there, he gives the signal and many seconds are saved.

He must be an information bureau as well. Very often people want to know how to get to a small, nearby country town; how to get to a certain street number; ask where Larry "Whatsisname" is living; what time does the Bethlehem car pass; when will the Muhlenberg car reach Sixteenth and Hamilton Streets, and hundreds of other questions. Not only must he know Allentown's streets, buildings and people, he must be able to digest railroad time-tables and reel them off in a wink. He must help ladies on the trolleys. He must call off the names of the trolley destinations as the trains come in. He must smile at the little ones, and at the big ones, too. He must be on duty in fair weather and foul. He must hold cars for late trains. He must direct them across the railroads. He must be a human encyclopedia of everything that pertains to or is part of the Lehigh Valley Transit Company, with its many routes and its wide-flung system.

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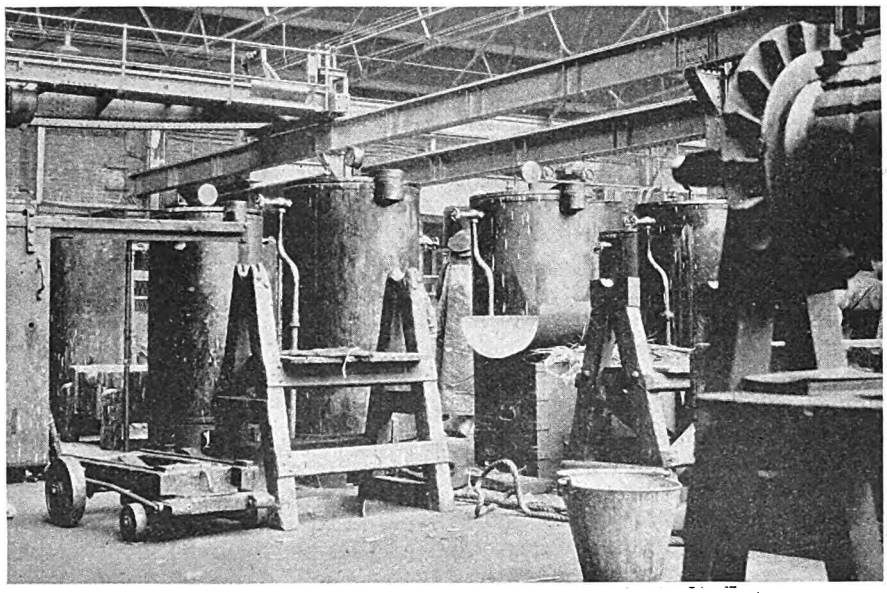
Maintenance Methods *and* Devices

Small Impregnating Tanks Favored

SMALL impregnating tanks are used by the London County Council Tramways, London, England, to supplement the one large impregnating tank with which its shop is equipped. The management, which is an extensive user of impregnation in motor repairs, believes this plan is preferable to the use of a few large tanks. There are fifteen small tanks, each of which will hold an armature. All are served by an overhead crane. It is the practice to leave an armature in one of these tanks for about six hours.



London County Council Tramways has fifteen impregnating tanks, each of which will hold an armature

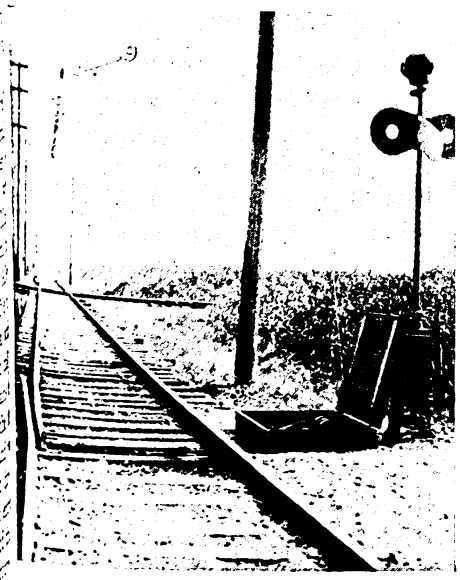
Railroad Crossing Derail for One-Man Cars

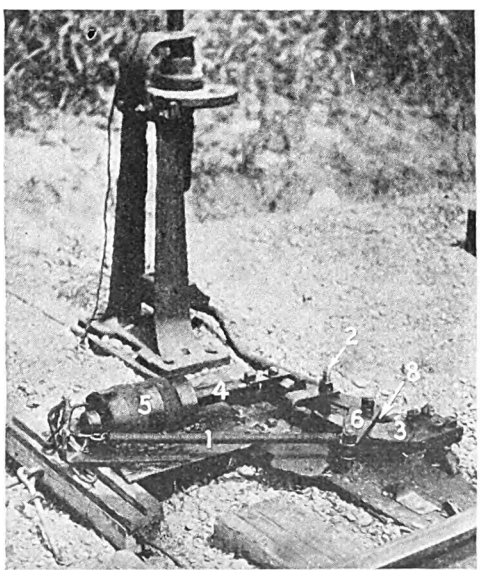
FIVE railroads are crossed at grade by the tracks of the Cleburne interurban division of the Northern Texas Traction Company, Fort Worth, Tex. At the time the interurban line was built the owners agreed to maintain derail switches on both sides of each railroad crossing, these derails to be kept open except when interurban cars were actually crossing the track.

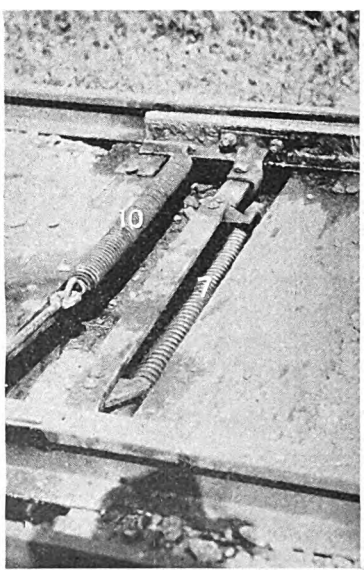
An arrangement of ordinary hand-operated derail switches served very well as long as the cars were operated by two men, but when one-man operation was begun the problem of operating the derail switches immediately presented itself. Full automatic operation, the company says in its 1927 Coffin brief, did not seem to be satisfactory as it did not require the operator to get out of his car and look up and down the track for an approaching train. Finally the company decided to use a derail which it developed itself. It consists of an ordinary hand-operated derail switch with an electric trip to open the derail after the car has passed. The details of the switch follow:

When the interurban car is approaching the railroad crossing the switch point is open, as shown in the first illustration. Therefore, the operator has to bring his car to a full stop, get out and throw the switch lever so as to line up the switch point. Reference will now be made to the second view. When the switch point is lined up properly, a roller, 8, underneath latch 6 engages in a notch in plate 3 by the tension of spring 1. Plate 3 is bolted to the switch throw-rod. Latch 6 is pivoted at the point 2.

The car then proceeds to the contactor, which is mounted on the trolley wire 80 ft. beyond the switch







Northern Texas Traction develops derail for railroad crossings for use with one-man cars

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point, as shown at 9 in the first view. On reaching the contactor, the trolley wheel or slide on the car completes a circuit through the magnet coil 5 in the second view. The plunger, 4, in this coil then trips latch 6. The switch point then comes to an open position through the action of spring 10 in the third view.

Cars coming through the switch point in the opposite direction cannot latch or keep the point lined up after passing it for two reasons: The first is that when the manually operated switch stand returns to the open position the handle automatically drops into a slot. The second reason is that as the car comes through the point, spring 7 acts in the ordinary way to return the point to the open position. The slot in the usual semaphore switch stand that holds the operating handle in closed position is filled up.

There are two of these equipments at each railway crossing and the company has had ten in service for some time with very satisfactory results.

Bearing and Gear Case Maintenance in Birmingham

SEVERAL ingenious maintenance methods of the Birmingham Electric Company are given in the 1927 Coffin Prize brief submitted by that company. Some of these have already been described in the Maintenance Data pages of other issues. Brief notes of some others follow:

Bronze bearings are now used for armature and axle bearings and are tinned by a rather novel device. After the bearings are heated in the gas furnace they are placed in a jig while hot, the tinning being applied by spinning the bearing around. This assures a smooth finish and even application of the tin to the interior surface of the bearing.

In the renewal of axle bearings it was quite frequently found that the axles were worn, and as it was customary to carry in stock bearings bored for a standard axle, they would not fit the worn axle. To overcome this trouble, axle bearings are only finished on the outside and rough-bored on the inside. A specially designed chuck was provided, so that now axle bearings are fitted to the individual axle to which they are applied. This has increased the life of the axle bearings 15 per cent and greatly reduced the noise of the car.

To overcome trouble in keeping gear cases on G.E.-57 and 67 motors tight, a $2\frac{1}{2}$-in. x $\frac{5}{8}$-in. wrought-iron strap was welded to the top of the gear case and the motor frame. This converted the type of support to a three-point suspension instead of two. This has reduced the maintenance of the gear cases on these types of motor by at least 50 per cent.

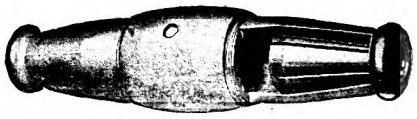
Loose armature "bands" render discordant music. Keep them keyed up tight and in tune.

Much of the yarn waste used in carhouses for car journal packing is now reclaimed. The oiled waste is first heated to a temperature close to boiling, the mass being stirred meanwhile to remove all dirt. The reclaimed waste is stored in metal containers and the oil is piped to underground tanks. This practice has reduced the oil cost one-half and the waste annual consumption from 14,000 lb. to 5,000 lb.

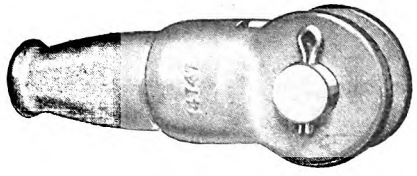
New Equipment Available

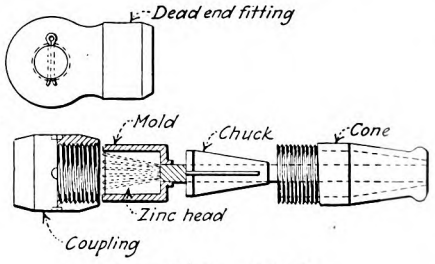
Improvements in Splice and Dead End

STRENGTH and ease of attaching are claimed for a new cable splice and dead end recently introduced by the Ohio Brass Company, Mansfield, Ohio. The cable splice consists of two cones and two chucks connected by a coupling, one threaded right hand, the other left, with space provided for tightening with a spanner wrench.



New cable splice





New dead end device

The dead end is made up of a cone and a chuck with a clevis for connecting to dead end insulators. A zinc head molded on the end of the cable bears against the chuck and the strain on the cable pulls the chuck into the cone, compressing it on the cable and holding it in place firmly. The gripping action of the chuck increases with the tension. All strands of the cable bear their proportionate share of the load, because after the cone and the chuck are slipped over the cable, the ends of the strands are spread and cleaned with emery cloth and tinned by dipping into molten zinc, with a flux of pure sal ammoniac. A mold is then clamped to the end of the cable and a zinc head is made which holds the ends of the strands and makes a positive electrical contact.

The device is made of high-strength, smoke-resisting bronze; it is more easily and quickly assembled because of fewer parts and because wrench surface on the cones and on the coupling is provided. Both the dead end and the splice are made in sizes to fit all cables from $\frac{1}{2}$ in. to 1 in. diameter.

Combination Universal Saw and 8-In. Jointer

BY COMBINING a motor-on-arbor saw with an 8-in. jointer the Gallmeyer & Livingston Company, Grand Rapids, Mich., is offering a combination tool to the trade. Important construction and operating features of both machines are maintained. There is nothing to lock or unlock when changing from operating one machine to the other. When used as a jointer the saw is dropped to its lowest position and the slip coupling is moved to engage the coupling on the jointer.

The motor develops sufficient power to rip $2\frac{1}{2}$-in. stock at a satisfactory speed. The motor-on-arbor construction makes it possible to eliminate belts, gears or flexible couplings and provides a most efficient and positive drive.

The machine is mounted on a portable truck type base. Two rollers at the back and two stationary feet at the front of the base provide a firm setting on the floor when the machine is in operation. By pulling the handle forward to a position for moving

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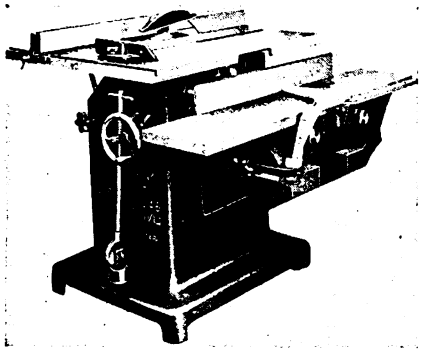
the machine a cam is raised, which in turn automatically lifts the feet from the floor and brings the weight of the machine on a third roller which is carried on a swivel bearing moving with the handle. This makes a convenient means of moving the machine from place to place as occasion demands.

The jointer tables are adjustable in height by means of small hand wheels under the ends. The machine will handle work up to 8 in. wide. The adjustment of the front table will allow a depth of cut to ½ in. and a rabbeting groove in the rear table allows the cutting of rabbets up to that depth.

The fence can be set at any desired position on the front table. It is adjustable from any angle from 90 deg. to 45 deg. The 30-in. x 34-in. saw table is properly machined and can be tilted to any angle up to 45 deg. and instantly locked at the desired setting. It is an iron casting, stiff,

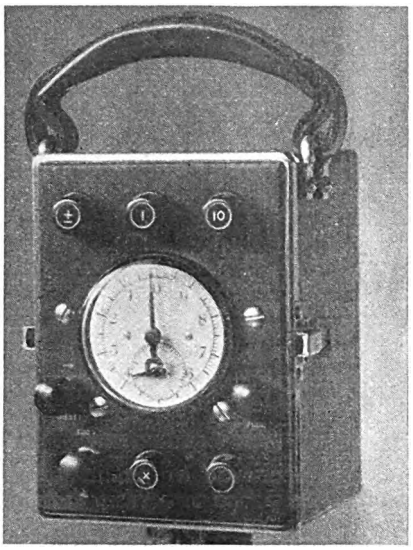


Motor-on-arbor type of universal saw and 8-in. jointer

well ribbed and similar to that supplied on high-grade machines. A dial with graduations and a pointer indicate the exact position of the table at all times. A stop is provided to facilitate a quick and accurate return to the horizontal position. A cross-cut gage can be used on either side of the saw, two slots in the table, one on either side, being arranged for this purpose. The ripping gage can also be used on either side of the saw. The tightening of the lever-head screw locks the ripping gage in position and lines it up automatically with the saw.

A saw guard protects the operator and fits down over the saw. It can be set instantly to allow any thickness of stock to be cut. A splitter guard is also part of the safety equipment. It keeps the stock from pinching the saw. A saw 12 in. in diameter is used which may be raised and lowered from flush with the table to high enough to cut 2½-in stock.

Temperature Compensation Features Watt-Hour Meter



Portable watt-hour meter with temperature compensation features

SEVERAL advantages are claimed for a new type OB portable standard watt-hour meter which has recently been placed on the market by the Westinghouse Electric & Manufacturing Company. The outstanding improvement is the compensation for temperature errors at both unity power factor and low power factor, which is inherently permanent for both the electromagnets and the permanent magnets and does not depend on the movement of mechanical parts with the variation in temperature.

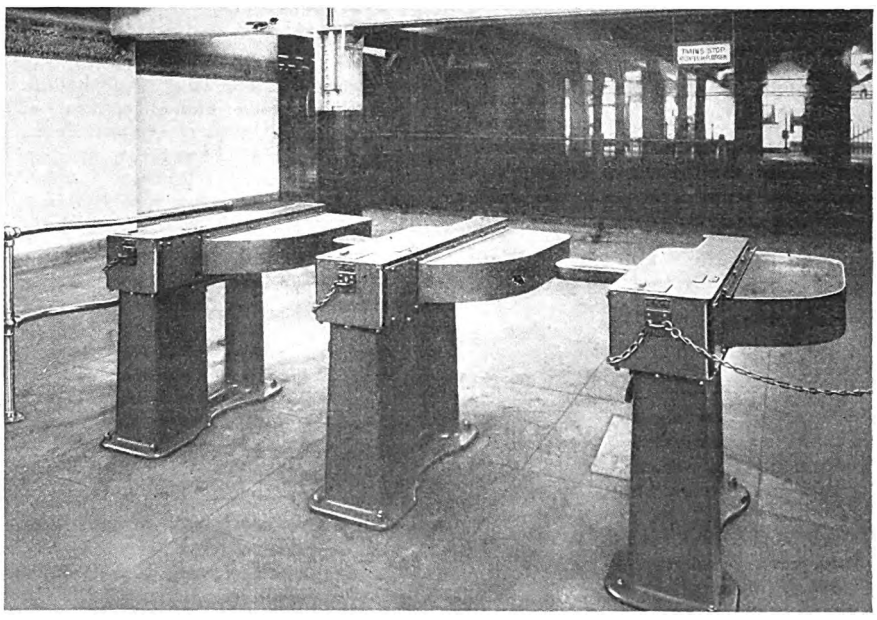
Superior accuracy is obtained along with a decrease in size and weight. The micrometer adjustments have been simplified and the electromagnets are of the one-piece OB type. A zero reset is provided by which both pointers can be adjusted. Potential settings are changed by means of a small switch, and three current binding posts are used, so that the meter may be connected for either 1 or 10-amp. capacity.

New Automatic Non-Electrical Turnstile

"COINPASSOR" is the trade name given to the new automatic coin-controlled turnstile recently developed and put on the market by the Perey Manufacturing Company, Inc., New York, N. Y. The machine is non-electrical and therefore requires no wiring installation.

The important operating principle is the use which it makes of the coin or token. Instead of using the coin to operate some part of the mechanism, the "Coinpassor" makes the coin a part of the mechanism which the patron himself operates in passing through. The coin plays only a passive part in the operation of the turnstile, yet without the coin the mechanism is, in effect, incomplete and cannot operate.

The Brooklyn-Manhattan Transit Corporation, operating subways and elevated railways in New York City and Brooklyn, has given it a thorough trial, having installed 25 of them in its busiest stations, and reports that they have stood up satisfactorily with only routine attention. The machines have also been used by the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey.



Battery of Perey non-electrical turnstiles installed in B.-M. T. subway station

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Association Activities

Problems of Commissioners Treated in Committee Reports

MOTOR vehicle transportation, public ownership and operation, grade crossings and public relations were the principal subjects covered by committees of the National Association of Railroad and Utilities Commissioners at their convention held at Dallas, Tex., Oct. 17 to 21. Each report covered an important phase of regulation of public utilities, bringing enlightenment on some particular problem of the commissioners.

Motor Vehicle Regulation

The report of the motor vehicle transportation committee stated that if regulation is to accomplish the best possible results it should be all inclusive. That is, all classes of operations must come under the purview of the law if it is to be made really effective and prevent discrimination, both in the matter of rates and charges and as between the various operators. It is quite obvious if the man operating between fixed termini and upon regular schedule, and who under these conditions must of necessity file tariffs and adhere thereto, is to be faced with the competition of unlicensed and unbridled operators who would take from him only the cream of the business paying the most profitable returns, that he will be in a very unprofitable condition.

The opposition to regulation evidenced on the part of the public in its early stages has largely disappeared. The public has come to a realization of the benefits of proper regulation, and that realization is reflected in the activities of enforcement officers.

Inability to accumulate accurate data over a considerable period of time reflecting the results of the operation of the motor vehicle in the public service is a handicap to regulatory authority in reaching scientific conclusions. The explanation of this is that apparently many operators have had little or no business training, and their volume of business is too small to warrant the expenses incident to the employment of skilled clerical forces. Another explanation is found in the fact that the federal government has not yet assumed supervision, and also that there has not always been helpful co-operation on the part of state and county peace officers in the strict enforcement of state laws, which, in the early stages of regulation, were not always popular.

Another of the difficulties confronting proper regulation is the activity of the fellow engaged in "private-contract" operations. Even some of those operating under permits between fixed termini and on regular schedules have asserted the right to handle this class of business. It is difficult to determine the dividing line between the common carrier and the man engaged under private contract by motor vehicle.

Public Ownership

Public operation of public utilities, asserted the public ownership and operation committee report, cuts deeply at the heart of our American system of business and government. Our system of private ownership and operation has been brought about by evolution based on ideas which permeated our whole life and methods of thought. In this country the development and conduct of our industries was wisely left to the initiative of private citizens, and our conception of the relation of government to business has been in the main the simple one that government existed merely to prevent the rights of activities of one man from encroaching upon the equal rights of another.

General management and supervision are found to suffer with public administration, and the period of service of public employees is generally brief, due to the fortunes of politics. The reward of labor is generally less in public employ, and public officials too often find that they are bound by laws or practices that do not permit of the discretionary power that may be exercised in private employment. As a general thing, utilities owned and operated by the public furnish inferior service to that furnished by privately owned and operated utilities. They are on a lower level generally than the privately owned corporations, and as a rule they are slow in responding to new discoveries and new methods and often fail to supervise their equipment while discriminatory rates are as flagrant as they were prior to regulations in private plants.

All privately owned public utilities begin with systematic engineering plans of construction work, and there arises the first economy in favor of private operations. In organizing the staff to design and build, merit and efficiency alone are considered, and each man is selected and each move is made to secure the largest, quickest and safest return for the money expended. Political considerations do not enter.

Throughout the business world the best service is rendered when there is hope of reward, and the best commodity is produced when there is hope of profit. The losses due to extravagance and misdirected efforts of public operations of utilities will represent enormous dividends on properly applied capital and generally a plant can be built and operated at less cost by private capital than by public funds. All of these things, we believe, go to make public operations of public utilities undesirable.

Not agreeing with the views of the remainder of the committee on public ownership and operation, Joseph B. Eastman prepared a separate statement. He explained that these industries are very properly called, not private, but public utilities, and that public ownership and operation of utilities would not mean an entry by the government into the field of private business. Ownership and operation are different, he stated, and of the two operation is the more debatable. Public regulation is very necessary for private enterprise, he added.

Public Relations

The committee on public relations in its report made three recommendations for the establishment of proper relations in the field of public utility service:

1. That the different utility companies faithfully and courteously fulfill all their assumed obligations to serve the public and consistently inform the public as a co-partner in business on all matters.
2. That the public, as a co-partner in the utility industry, should be enlightened by educational programs in schools.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Nov. 2-3—**Iowa Electric Railway Association, operating and maintenance sections, annual convention, Blackhawk Hotel, Davenport, Iowa.**

Nov. 4—**Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 33 West 39th Street, New York, N. Y.**

Nov. 4—**American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York City.**

Nov. 17-18—**American Society Mechanical Engineers, annual meeting, Engineering Societies Building, 29 West 39th Street, New York, N. Y.**

Nov. 17-18—**Personnel Research Federation, Accident Reduction section, 40 West 40th Street, New York, N. Y.**

Jan. 26-27—**Central Electric Railway Association, Cincinnati, Ohio.**

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by the public press, by lectures, and by general authentic publicity information on the fundamental principles pertaining to utility companies, their organization, operation, service, and regulation, and particularly as to the vital importance of financially sound utility companies and the individual and public importance of the service they render.

3. That regulatory commissions: (a) Use every reasonable effort to impress upon utility companies coming under their jurisdiction the necessity of good public relations and their duty in maintaining such relations, to keep their patrons honestly informed on all matters of legitimate personal interest in connection with their operation. (b) Give to the public press all information of public interest pertaining to their duties and activities as regulatory bodies. (c) Co-operate as far as possible with the educational institutions of the state in an effort to establish a carefully prepared study of public utilities, public utility companies, and public utility regulation, in the public schools and colleges. (d) Conjoin with other commissions in establishing standard rules of practice and procedure wherever practical, and in co-ordinating the regulatory functions of the different state and federal commissions.

GRADE CROSSINGS

That safety of travel at grade crossings is measured by the mental attitude of the travelers was the conclusion of the committee on grade crossings and trespassing on railroads. The committee recommended that educational methods be employed to correct the mental attitude of the public and to promote observance of safety rules. It also recommended that grade crossings be eliminated wherever possible.

Iowa Association Announces Program

REDUCING operating costs of electric railway transportation without impairment of service will be the theme of the annual convention of the operators' section, Iowa Electric Railway Association, which will be held at the Blackhawk Hotel, Davenport, Iowa, on Nov. 2-3. The meetings will be led by Chairman John Sutherland. Following is the program:

Wednesday Morning, Nov. 2

Welcome from Davenport, by Louis E. Roddewig, Mayor.

"Some of the Problems Confronting the Electric Railways of Today and How They Have Been Met at Rockford, Ill.," by A. P. Lewis, general superintendent Rockford & Interurban Railway and Rockford City Traction Company.

"Shop Practices and Elimination of Equipment Failures," by Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad.

Wednesday Afternoon

A tour of inspection of railway properties in the Tri-Cities, including the repair shops in Rock Island, arranged through the courtesy of the Tri-City Railway.

Wednesday Evening

Annual convention banquet.

Thursday Morning

"Making the Most of Motor Coach Popularity in Bringing Back Riders," by D. D. Bentzinger, assistant to general manager Iowa Southern Utilities Company, Centerville, Iowa.

"The Importance of Freight Business in Building Interurban Revenues," by C. F. Doge, general superintendent Clinton, Davenport & Muscatine Railway.

"Co-ordination of Motor Coaches and Street Cars and Operation and Maintenance of Both," by A. H. Smith, superintendent Dubuque Electric Company.

Thursday Afternoon

"Track Construction and Maintenance," by W. L. Wilson, civil engineer Des Moines City Railway.

"The Automatic Treadle Door and Its Relation to the Modern Car," by R. S. Frehse, sales engineer National Pneumatic Company.

"The Gas-Electric Drive for Motor Coach Operation," by W. A. Clough, engineer General Electric Company.

A.I.E.E. to Discuss City Growth

"PREDICTING the Future for New York" is the subject for the next meeting of the New York Section of the A.I.E.E., to be held on Nov. 4. The following papers will be presented:

"Probable Growth of New York City and Distribution of Population," by E. P. Goodrich, consulting engineer on city planning for the Sage Foundation.

"Architectural Requirements and Building Service," by R. H. Shreve, president New York Building Congress.

"Suburban Transportation," by L. S. Miller, president New York, Westchester & Boston Railway.

"Urban Transportation," by C. E. Smith, consulting engineer.

"Telephone Service," by J. S. McCullough, president New York Telephone Company.

"Light and Power Service," by J. W. Lieb, vice-president and general manager New York Edison Company.

American Association News

Engineers' Standing Committees Announced

STANDING committees of the Engineering Association on power, purchases and stores, rolling stock, and way and structures have been completed. These are the continuing committees which have charge of the activities of the four principal divisions of the association's committee work. The personnel follows:

POWER

W. E. BRYAN, superintendent of power United Railways of St. Louis, St. Louis, Mo., chairman.
W. H. BASSETT, Waterbury, Conn.
L. W. BIRCH, Mansfield, Ohio.
C. A. BUTCHER, East Pittsburgh, Pa.
M. W. COOKE, Pittsburgh, Pa.
H. A. KIDDER, New York, N. Y.
JOHN LEISENRING, Springfield, Ill.
J. F. NEILD, Toronto, Ont., Canada.
F. W. PETERS, Schenectady, N. Y.
W. J. QUINN, New York, N. Y.
D. L. SMITH, Chicago, Ill.
L. J. TURLEY, Los Angeles, Cal.

PURCHASES AND STORES

JOHN Y. BAYLISS, director of purchases and supplies Virginia Electric & Power Company, Richmond, Va., chairman.
A. S. DUNCAN, East Pittsburgh, Pa.
A. L. FISHER, Cincinnati, Ohio.
J. FLEMING, Washington, D. C.
B. W. FORKNER, Mansfield, Ohio.
A. E. HATTON, Pittsburgh, Pa.
F. A. JORDAN, Atlanta, Ga.
E. A. MURPHY, Indianapolis, Ind.
A. A. ORDWAY, Boston, Mass.
W. E. SCOTT, Philadelphia, Pa.
C. THORBURN, Los Angeles, Cal.
W. J. WALKER, Schenectady, N. Y.

ROLLING STOCK

A. T. CLARK, superintendent rolling stock and shops United Railways & Electric Company of Baltimore, Baltimore, Md., chairman.
R. S. BULL, superintendent of equipment Pittsburgh Railways, Pittsburgh, Pa., vice-chairman.
V. W. BERRY, Richmond, Va.
C. BETHEL, East Pittsburgh, Pa.
W. C. BOLT, Chelsea, Mass.
J. M. BOSENBURY, Springfield, Ill.
J. A. BROOKS, Philadelphia, Pa.
M. R. HANNA, Schenectady, N. Y.
J. S. MCWHIRTER, New York, N. Y.
A. D. MCWHORTER, Memphis, Tenn.
T. H. NICHOLL, Anderson, Ind.
R. B. SMYTH, Boston, Mass.

WAY AND STRUCTURES

H. H. GEORGE, assistant to chief engineer Public Service Production Company, Newark, N. J., chairman.
E. M. T. RYDER, way engineer Third Avenue Railway System, New York, N. Y., vice-chairman.
C. A. ALDEN, Steelton, Pa.
C. H. CLARK, Cleveland, Ohio.
E. B. ENTWISLE, Johnstown, Pa.
C. L. HAWKINS, St. Louis, Mo.
W. G. HULBERT, Easton, Pa.
J. R. MCKAY, Fort Wayne, Ind.
C. A. SMITH, Atlanta, Ga.
A. T. SPENCER, Montreal, Quebec, Canada.
H. M. STEWARD, Boston, Mass.
J. H. SUNDMAKER, Cincinnati, Ohio.
F. B. WALKER, Boston, Mass.

"Met" Section Meetings Announced

MEETINGS for the current season of the Metropolitan Section, A.E.R.A., are scheduled as follows: Nov. 4 and Dec. 2, 1927; Jan. 6, Feb. 3, March 2, April 6, and May 4, 1928. The hour and place of each meeting will be announced as arrangements are completed.

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News of the Industry

Piedmont Renews Its Application

Charles Evans Hughes has been engaged as counsel by the Piedmont & Northern Railway in its effort to get permission from the Interstate Commerce Commission to extend these lines.

The road filed exceptions with the commission on Oct. 25 to a proposed report by Examiner Haskell Davis refusing to permit the extensions on the ground, among other things, that they would parallel for a long distance the Southern Railway and are not needed. Other exceptions were filed by Governor Richards of South Carolina and several municipalities and civic organizations which favor the extensions.

The Piedmont & Northern claims that its original purpose was to extend its lines as an interurban electric road but that World War conditions interfered with its program.

The Southern Railway, in earlier proceedings, declared if the application is granted its annual earnings will be lessened by $10,000,000. Other steam roads aligned against the granting of the application of the electric railway are the Seaboard Air Line, Atlantic Coast Line and the Clinchfield.

Ten Cents in Beacon

An increase in fare in two operating zones from 7 cents to 10 cents with three tickets for 25 cents was permitted the Fishkill Electric Railway, Beacon, N. Y., by the Public Service Commission in an order dated Oct. 20. The company was also authorized to increase its 54-trip $5.40 commutation ticket rate to $6. There will be no change in school children's tickets.

The value of the property used in giving service was placed at $246,719. After payment of interest charges and amortization there would be available $5,885 for dividends and extraordinary expenses. Commissioner Van Namee's memorandum stated that the latter amount would hardly be realized and that it was apparent that any increase in revenue which might be obtained from the new rate would not suffice for a reasonable return upon the property used in giving service.

The railway has been in operation since 1892.

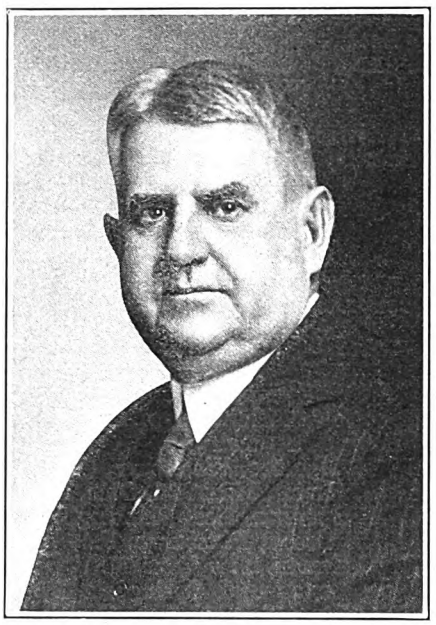
Columbians Awakened to Need of Better Transportation

Sentiment which scores the 10-cent jitney and a crippled bus system in Columbia, S. C., is rapidly crystallizing in favor of the street car which deserted the streets of the city last March. Now in the hands of the Supreme Court is the action of the Attorney-General of the state seeking a mandamus to enforce the resumption of street car service. Railway service was formerly supplied by the Columbia Railway, Gas & Electric Company.

In a recent editorial, the leading daily of Columbia, the *State,* takes the position that unless better transportation be provided growth will be hampered and even very seriously retarded. Where is there a town of 100,000 inhabitants without railway service, says this writer, who states that it is almost inconceivable that a town could grow to such size under the heavy handicap imposed by deprivation of electric railway service. Bungling over the "transportation situation" is charged with a net result that cars are not in operation, buses and jitneys are not prospering and the public is dissatisfied. "Think it over, gentlemen—all of you."

Thomas N. McCarter Honored

Employees of New Jersey company surprise their president on occasion of the 60th anniversary of his birthday. Stock-selling campaign huge success



Thomas N. McCarter

ABOUT 1,000 employees of the Public Service Corporation of New Jersey assembled in the auditorium of the Newark Terminal Building on the morning of Oct. 20 to participate in the ceremonies attendant on the awarding of trophies and prizes in connection with the recent 6 per cent cumulative preferred stock campaign, in which 115,226 shares were sold to 15,492 subscribers.

At the conclusion of the trophy ceremonies, the meeting was turned into a birthday party in honor of the 60th birthday anniversary of President Thomas N. McCarter. A huge bunch of American beauty roses was presented to the president by John Craig, Rutherford, one of the oldest employees in any of the companies. Mr. Craig is 69 years old and has a service record of 35 years. He is employed at the Kearney electric generating station.

As the president rose to speak, the chair in which he was seated during the presentations was transformed to represent a huge birthday cake. Sixty large electric globes were set on a white table with the Public Service emblem in the background.

Six grand prizes and six trophies, presented by the president and vice-presidents, were awarded for the largest number of shares sold and for the greatest number of subscribers to the stock.

At the conclusion of the presentation of these awards President McCarter thanked the whole Public Service organization for its splendid work in the campaign.

The grand prize winners were: First, $150, William T. Blackwell, Newark, general lighting representative; second, $125, Timothy J. Fields, Paterson, instructor, railway; third, $100, A. S. Hebbe, foreman, Newark Railway Shops; fourth, $75, Miss Annie G. Morris, combination representative, Burlington commercial office; fifth, $50, George S. Curtis, Paterson, Passaic Division superintendent of electric distribution; sixth, $25, Walter Johnson, assistant cashier, Trenton commercial office.

The trophies were silver cups and were awarded as follows: The president's trophy to the Southern Division; Vice-President R. R. Young, in charge of sales, presented his trophy to the commercial department, Southern Division; Vice-President Edgar Allegaert of the electric department, to the Essex Division; Vice-President John A. Clark of the gas department, to the Bergen Division; Vice-President Matthew R. Boylan of the railway and transportation companies, to the Southern Division; Vice-President N. A. Carle of the Production Company, to the electrical engineering department; Vice-President P. S. Young, in charge of finance, to the general office group.

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Draft of Indeterminate Permit Bill Presented

Last of traction enabling bills is received by Chicago City Council sub-committee. Realtors condemn indeterminate permit plan of companies. Municipal ownership advocates active

COMPLETING the work of preparing five legislative bills to be used as a basis for settling Chicago's traction problem, James Breen, assistant corporation counsel, has turned over to the City Council's sub-committee on local transportation a tentative draft of a new indeterminate permit bill. Four bills dealing with subway construction, consolidation, a local transit commission and repeal of the twenty-year limit on electric railway franchises have previously been accepted and approved by the sub-committee.

As interpreted by the city attorney, the indeterminate measure, which is regarded by the companies as the most vital of all to the solution of the problem, allows the city the option of granting either a fixed-term franchise or one without time limit. The bill introduced into the Legislature last spring by the companies provided for an indeterminate franchise only.

A final meeting of the sub-committee to approve and recommend to the full committee on local transportation the entire set of bills will be held on Nov. 2.

Sharp criticism of the indeterminate plan as proposed by the companies was voiced during the week ended Oct. 22 by several speakers at a meeting of the Cook County Real Estate Board. Edward W. Bemis, consulting engineer, urged the realtors to support either the Lisman or the Detroit purchase plan as the only practical measures which have so far been presented to the City Council. This proposal to grant indeterminate permits, he contended, would give the present companies complete and perpetual control of the city's transit facilities.

Although he had no specific scheme to submit, Carl D. Thompson, secretary of the Public Ownership League of America, who was another speaker, suggested that acceptance of the plan presented by executives of the surface and elevated line systems would absolutely preclude any chance of the city to own its local transportation systems.

Under the Lisman ordinance, now pending in the City Council and outlined previously in the ELECTRIC RAILWAY JOURNAL, the City Council would give to the New York banking syndicate headed by Frederick J. Lisman a railway franchise for twenty years and a renewal for ten years more, after which the entire surface lines system would be turned over to the city for $1. The Detroit purchase plan was proposed to the City Council several months ago as means of negotiating purchase of the car lines by the city and is based on methods said to be successfully employed by the city of Detroit.

Local municipal ownership advocates, headed by Attorney Henry M. Ashton, have begun circulating a petition asking for a referendum next April on the question of supplanting the present private railway operations with a large system of municipally owned and operated motor coaches. If they succeed in getting the necessary 125,000 signatures, or 25 per cent of all registered, the following questions will be placed upon the ballot at the spring election:

1. Shall the city of Chicago proceed at once to motorize its entire surface lines transportation by purchasing 4,400 pneumatic-tired buses and equipment out of the $55,000,000 now in the city traction fund?
2. Shall the city of Chicago proceed to operate buses?
3. Shall the city of Chicago refuse to grant any permit or franchise giving the Chicago Surface Lines or any other private corporation the right to operate street cars in the streets of Chicago?

Coincident with the announcement of the municipal ownership petition, Corporation Counsel Samuel Ettleson handed down a rule which again defeats proposals to borrow money from the city traction fund, a sum which has been accumulated by street car riders during the period of the twenty-year franchise granted to the Chicago Surface Lines in 1907.

The decision was rendered in connection with the request of the City Comptroller to be allowed to borrow money from this fund to tide the city government over until this year's taxes are received and to give city bonds as security Mr. Ettleson held, however, that the city might sell bonds to the traction fund up to the $15,000,000 maximum allowed by the traction fund laws.

McGraw-Hill and A. W. Shaw Companies Form Subsidary

Four national circulation industrial publications affected by publishing plan which will combine them into two monthly papers

INCORPORATION of a subsidiary to publish four long-established national circulation industrial publications just acquired was announced on Oct. 26 by the McGraw-Hill Publishing Company, Inc., New York, and the A. W. Shaw Company, Chicago. The subsidiary is the McGraw-Shaw Company and the papers affected are *Factory, Industrial Management, Industry Illustrated* and *Industrial Engineering*. Under the announced publishing plan, the first two papers will be combined as *Factory and Industrial Management,* starting with the January issue. The third paper will be consolidated with *Industrial Engineering,* a McGraw-Hill publication, starting with the December issue.

Facts underlying the formation of the subsidiary were outlined in a statement by James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., and in a letter sent to advertisers in the affected papers by A. P. Gumaer, as manager of *Industrial Engineering,* with which is consolidated *Industry Illustrated,* and by James O. Peck, as manager of *Factory and Industrial Management.*

The statement by Mr. McGraw stressed the fact that the arrangement by which the two parent companies control jointly a subsidiary publishing important publications devoted to industry is in no sense or degree a merger of the McGraw-Hill and Shaw groups of journals. He pointed out that the two companies have effected a separate subsidiary organization to serve more adequately in a publishing way those manufacturers whose broad marketing problems extend throughout the range of industry.

Letter Gives Facts

The letter from the two publication managers gives the details of the reasons for the latest announced development in the field of business paper publishing.

The communication addressed to advertisers says:

Believing that you will be greatly interested in a publishing move for better marketing we want you to know of plans to intensify the service value of several papers with which you are familiar—*Factory, Industrial Management, Industrial Engineering* and *Industry Illustrated.*

Two consolidations have been made and plans are being put into effect to add materially to the strength of their editorial, circulation and advertising functions.

To carry out this program, the McGraw-Hill Publishing Company, Inc., and the A. W. Shaw Company have formed a subsidiary publishing company known as the McGraw-Shaw Company. No change has been made, however, in the corporate status of the parent companies. *Factory,* heretofore published by the A. W. Shaw Company, and *Industrial Management,* recently acquired by the McGraw-Hill Publishing Company, will appear in January as one publication under the name of *Factory and Industrial Management.*

Industrial Engineering, heretofore published by the McGraw-Hill Publishing

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Company, and *Industry Illustrated,* recently acquired, will appear in December under the name *Industrial Engineering,* with which is consolidated *Industry Illustrated.*

While these consolidated publications will retain their original fields it is the aim of the McGraw-Shaw Company, through far-sighted industrial journalism, to keep a step ahead of the changing production needs of industry, whether those needs are influenced by management, finance, engineering, production or marketing.

Factory and Industrial Management will serve the top production executives in problems of production management and policy. *Industrial Engineering,* with which is consolidated *Industry Illustrated,* will deal with all phases of plant services—mechanical, electrical, or otherwise—through which production is attained.

The letter concludes:

Seldom have publishers had the opportunity to offer a more tangible service to industry or to individual manufacturers. Details of the plan will show how manufacturers can do a more economical and efficient job of advertising and selling.

James H. McGraw is chairman of the board of the McGraw-Shaw Company. A. W. Shaw is president.

Holyoke Decision Significant

Massachusetts regulatory body insists railway shall be permitted to charge rates which under reasonably prudent and economical management will yield a fair return

UNUSUAL interest attaches to the decision by the Massachusetts Department of Public Utilities to permit the Holyoke Street Railway to increase its rate of fares. The schedule is a modification of the one the company filed, but is intended to enable the company to maintain the quotation of its stock at par. The commission filed a long decision which outlines the financial policy to be followed in Massachusetts in regard to railway fares.

The matter can be understood intelligently only by the recital of some of the recent events in connection with the case. On Aug. 1, 1927, the company filed tariffs with the commission to become effective on Aug. 31. These tariffs were intended to provide for an increase in the regular rates of cash fares from 6 cents to 10 cents, with a provision for the sale of four tickets for 30 cents, good for a ride in any one fare zone. They also provide for certain overlaps, for a ride from any part of the central zone, called Section A, to any other part, by the use of transfers when necessary, upon the payment of a 10-cent cash fare, for special tickets between various parts of the system when sold in strips varying from four to five, and for an increase in pupils' tickets from 3 cents to 5 cents when sold in strips of ten.

The date the rates were to go into effect was suspended from time to time, the last suspension being until Oct. 22.

In view of the public interest and discussion which has taken place in this matter, the commission prefaced its consideration of the subject with a few fundamental principles sometimes lost to sight in the heat of advocacy. In this connection the state body said:

General Laws of Massachusetts, Chapter 159, section 14, requires this department, before it sets aside rates fixed by a carrier, to determine that the same are unjust and unreasonable, and also requires that, if the department shall be of such opinion, it shall determine the just and reasonable rates to be charged for the service to be performed. Where the question involved is not one of specific rates, but as here, of the whole rate structure of the company, this department is bound to follow the interpretation which has been given to this and similar statutes by the courts of this Commonwealth. There can be no doubt that this statute, which of course is mandatory upon us, interpreted in the light of these decisions, obliges us to permit the carrier to charge such rates as will give it a fair return upon the capital employed in the undertaking. We must perforce, therefore, approach this question in that view of the law. Apart from any question of law, we think it obvious that a public utility ought to be allowed rates under which reasonably prudent and economical management will yield a return upon the capital employed in the enterprise sufficient to enable it to sell its shares of stock.

Under the laws of the Commonwealth a street railway is obliged to sell its stock at par or not at all. Any policy, therefore, which results in a failure to maintain the value of its stock at par cripples its ability to meet the needs of the community, impairs its credit and, if long continued, results in financial disaster to the company and great inconvenience to the public. So long as the dividends paid on the capital stock of the company are only such as are necessary under prudent management to maintain the credit of the company and its ability to obtain new capital needed in its development, the interests of the company and its passengers are substantially identical. Adequate service cannot be given unless the passengers pay that which is necessary to provide the same.

The capital of the company consists of $1,342,000 of common stock, on which a premium of $276,160 was paid into the treasury of the company. The request of the company was that it be permitted to charge rates sufficient to yield a return of 6 per cent upon its investment. During the last seven years the company paid dividends of 6 per cent on its capital stock. This really was equivalent to only 4.98 per cent on the stock and premiums. In the last two years, at least, the company did not, in the opinion of the commission, make sufficient provision for depreciation, an operating expense necessary and proper to be charged against earnings. While the railway paid a dividend of 6 per cent in 1926, it actually earned only 4.17 per cent on its stock and premiums. For the first six months of this year its passenger revenue was $24,000 less than for the similar period last year, and up to the present no dividend has been paid this year. Its passenger revenue in 1926 was $188,000 less than in 1920 and 3,000,000 fewer passengers were carried in 1926 than in 1920, in spite of the fact that in the year 1926 the company operated 112,000 more passenger car-miles and 11,500 more passenger car-hours than in 1920. If there had been no falling off in the number of passengers carried in 1926, as contrasted with 1920, the company would have received additional revenue under its existing fares equivalent to the proposed increases. It was generally conceded by all at the hearings that the company had been and is giving good service to its patrons and that it has been and is well managed.

The company contended that to earn a net return of 6 per cent on its invested capital, on the basis of last year's earnings and of the first six months of this year, it would need $207,646 additional gross revenue. Based on its own experience and that of other companies, it estimated that the proposed schedule would yield an additional revenue of about $173,006. No reliable evidence was offered to refute this estimate, and, based on the experience of other railways that have increased their fares, the commission did not think that this estimate was excessive. To the contention by Holyoke people of discrimination against them, the commission said:

We feel that the company should permit passengers to ride from any part of Section H to any part of Section G, and vice versa, upon the payment of a 10-cent cash fare, issuing transfers therefor, and thus place riders in Chicopee substantially upon a parity with riders in Holyoke. If this should be done, we believe that there would not be any unfair or unjust discrimination.

In concluding its decision the commission said:

The proposed schedule provides for the sale of pupils' tickets in strips of ten for 50 cents, each ticket good for one ride in each fare zone. This requires pupils to pay 5 cents for a ride which costs regular patrons 7½ cents. We are of the opinion that pupils' tickets should be issued in strips of ten for 38 cents, to be sold in the manner prescribed in the schedule, each ticket to be good for one ride in each zone or section where a 7½-cent ticket enables a passenger to ride and that pupils' tickets should be sold in strips of ten for 50 cents, each ticket to be good for one ride between points where a 10-cent ticket or a 10-cent cash fare enables a passenger to ride.

When the tariff is amended in accordance with the changes above set forth, we think it should be allowed to go into effect. Accordingly, it is ordered that the tariff filed by the Holyoke Street Railway on Aug. 1, 1927, be canceled, with leave to the company to file an amended tariff carrying out the changes above outlined, and, upon such an amended tariff being filed, it shall become effective forthwith.

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Action on Omaha Franchise on Oct. 31

The City Council of Omaha, Neb., has finished its consideration of the draft of the new franchise for the Omaha & Council Bluffs Street Railway and will take final action on it on Oct. 31. In the meanwhile the officers and attorneys for the company are considering the draft, with the expectation of entering objections to several of its provisions. As the draft now stands it calls for a special election on Jan. 10, 1928. In this draft the Council has sought to meet the various objections urged by voters at the election where the company's draft was defeated last year.

One Dollar Weekly Pass for St. Petersburg

Weekly passes on the line of the Municipal Railways, St. Petersburg, Fla., will be put in force about Nov. 1. The passes will sell for $1. While the pass will be accepted on all railway lines in the city, it cannot be used on the buses. It was also made clear that passes could not be used by school children as the city gave these patrons the benefit of a 5-cent fare with transfer privileges from car to bus or from bus to car. The weekly pass was decided upon especially for those who live in the outlying districts and who use the cars regularly in going to and from their work. Persons making four trips a day on the street car will be able to save 96 cents a week by using the pass. Regular fares for seven days on four trips a day would amount to $1.96.

Franchises Sought by Key System

The Key System Transit Company, Oakland, Cal., has applied to the City Council of Richmond for 50-year franchises for all its lines in Richmond. Application followed a recent agreement that the company would maintain local car service if the long-term franchises were authorized. Several franchise grants are near expiration.

Electrification Planned of Reading Suburban Lines

Plans are being prepared, it is said, for the electrification of suburban lines of the Reading Railroad, Philadelphia. A start will be made on the Chestnut Hill branch next year and the work completed in about two years. Electrification of the lines to Glenside and Langhorne will probably follow and the cost of electrifying the three lines will be $10,000,000 to $12,000,000. Electrifying the Chestnut Hill branch will cost between $4,000,000 and $5,000,000, including the company's share of the cost of removing a number of grade crossings. Included in cost is the expense of electrifying the Reading Terminal at Twelfth and Market Streets in Philadelphia.

The company has placed orders for 35,500 tons of 130-lb. steel rails for 1928 delivery, which is about the same as last year, when 36,000 tons were ordered for 1927 road work. It is well supplied with steam equipment and no additions are contemplated.

As Things Are and as They Were in Altoona

Progress week in Altoona, Pa., which opened Oct. 25, is being participated in by the Altoona & Logan Valley Electric Railway, through a display arranged by the Altoona Chamber of Commerce. Large windows in the center of the business district were given over to the railway and in them is pictured a likeness of the newest in rolling stock owned by the company, together with the "standard" cars of 1900 and a picture of the first car ever operated in Altoona, a horse-drawn one.

Artistic Effect Important Consideration in Jamestown

The color scheme for cars most popular in the voting contest has been adopted by the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y. When the company purchased six new cars it asked the citizens to select the color for the equipment. The suggestion was first advanced by one of the company's department heads, who proposed that the cars be painted the colors of the city's three junior high schools, with a voting contest to choose the most popular combination.

Three cars were painted desert sand, deep cream, pyramid gray and fire red for Lincoln Junior high school; azure blue, deep cream, sage green, blue and fire red for Washington Junior high school, and pigskin, romany maroon, deep cream, fire red and gray for Jefferson Junior high school. The cars bore the pennant of the school represented. After a three-day contest, the Lincoln Junior high school combination, with a total of 463 votes, received the highest number of the 804 cast.

W. H. Pickard, traffic manager, said that the number of votes cast showed that the people were really interested in how the cars were painted, so that when the order for the new cars was placed the desired color scheme was adopted with slight modifications.

Ohio Fare Increase Turned Down

Stark County Commissioners rejected the request of the Northern Ohio Power & Light Company to increase the fare between Canton and Massillon, Ohio, from 15 cents to 25 cents. Other pleas for increased passenger rates were also turned down. As a result of the denial H. D. Berkaw, company superintendent, said that the case would be taken to the Public Utilities Commission. In its petition the company claimed that the present fare did not meet the operating expenses of the 8-mile line, which recently had been double-tracked.

School and Shut-in Children Have Own Car in San Francisco

Operation of a new parlor car for the use of children, principally for educational purposes, without charge, and also for the unprivileged and shut-in children, has been announced by Samuel Kahn, president of the Market Street Railway, San Francisco, Cal. The car is finished in white enamel, trimmed with gold, and fitted with all the latest safety appliances. The end sections boast of the latest type leather-upholstered seats. Thick carpet covers the floor of the center section, which has plush-cushioned wicker chairs and heavy plush window drapes.

Many trips are already scheduled to take technical classes of the San Francisco public and parochial schools to the company's car-building plant, the car operators' training room and one of the latest substations. T. A. Bragg, in charge of employment and training for the company, is acting as guide to the school classes. Technically trained men explain the mechanical and electrical processes in the various departments as the classes watch the inside workings of the big machines necessary to successful railway operation.

When schedules will permit, the car is to be devoted to unprivileged and shut-in children who need to get around and without some such service as this might not have an opportunity.

Louisville Carhouse Is Victim of Bandits

Masked bandits invaded the carhouse of the Louisville Railway, Louisville, Ky., on Oct. 16 and escaped with $1,300 in cash and $200 in car checks after forcing four employees to lie prone on the floor. Employees claim that the robbers had timed their visit, and had also learned just where the money was kept. However, a large safe containing $1,500 and boxes holding 84 coin containers from street cars, not yet emptied, were ignored.

Public Utility Courses in Illinois University Work

The School of Commerce of Northwestern University is conducting afternoon and evening courses in public utilities in Wieboldt Hall, Chicago, during the 1927-28 semester. These emphasize the economic, financial, legal and managerial principles in effective operation and management. This curriculum was established in recognition of the ever-increasing importance of the functions performed in modern industrial society by public utilities.

The University of Illinois is also offering a course in Economics of Public Utilities, through its College of Commerce and Business Administration. The courses on operation of public utilities, management of public utilities, public utility administration and other phases are open to graduates as well as advanced undergraduates.

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W. D. Mahon Warns of Dangers in Highly Competitive Business

The danger in bus and private automobile competition should arouse electric railway managements to the necessity of improving their services, in the opinion of W. D. Mahon, president of the Amalgamated Association. In a recent statement on present-day conditions he is reported to have said:

In the first place it would pay stockholders in these properties to reflect that the chief problems of management in the past have had to do with politics, economical operation and rate making. The business has been characterized by monopolistic conditions. "Ride the cars or stay at home," represented the laconic attitude toward development of business. Management must be jarred out of this state of mind if the street car industry is to prosper.

There will always be a use for street cars and a use for buses. Henry Ford once said, in discussing the street car problem, that nothing that ever came into the world and proved its usefulness had ever gone out of it. This union includes bus drivers as well as street car operatives, so it cannot be charged that our views are inspired by selfish interests.

The need of the moment is for intelligent efforts to improve street car service. Better cars should be provided. Comfort and speed should be sought. Plenty of new business remains to be developed. Automobile owners—many thousands of them—can be won back to street car riding if it is made more comfortable and more expeditious. The expense of motoring and the difficulties of parking would cause owners of cars to ride the trolley to business if they had not learned to despise the creeping rattlers that many companies operate.

One-Man Cars in Smaller Streets of Montreal

By decision of the City Council the way has been left open for the continued use of one-man tramcars in Montreal, Canada, in the smaller streets of the city, but not in the large thoroughfares. The question came before the Aldermen in the form of a report submitted by a committee suggesting that the use of these cars be prohibited in Montreal. A minority report recommended that the cars be given further trial. After a debate the Council decided the public interest would be best served by not taking a decisive stand against these tram vehicles in all city streets, and a motion was accepted in that sense.

Fatal Accident on Indiana Interurban

Eighteen persons were reported as injured on Oct. 14 when a car of the Union Traction Company of Indiana, Anderson, Ind., struck a truck trailer carrying a score of persons to a lodge dance at Emerson Avenue and the Honeybee line on the outskirts of the city of Indianapolis. A separate investigation of the accident has been ordered by the Indiana Public Service Commission. The conductor and motorman of the interurban, both of whom were injured and sent to the hospital, have been placed under arrest and released on $2,500 bond. The driver of the truck, who was not injured, also was placed under arrest and held under a similar bond. The truck had passed over the track, but the trailer was squarely in the middle of the interurban line when the inbound car collided with it.

Resumption of New Jersey Line Sought

Residents of National Park, N. J., have presented a petition to the Borough Council demanding resumption of railway service from there to Camden and Woodbury, discontinued some time ago because of the building of a bridge over Big Timber Creek. The line is operated by the Public Service Railway.

Foreign News

Good Year for Brazilian Traction

Net earnings of the Brazilian Traction, Light & Power Company for the year ended Dec. 31, 1926, totaled $12,278,654, compared with $8,848,594 the previous year. Comparison of the balance sheet with the figures of previous years showed remarkable growth. In 1922 the property account stood at $94,301,954. In 1926 it stood at $140,701,014. In 1922 total assets were $250,685,074. In 1926 this item stood at $286,104,734. Total assets have not grown as rapidly as property account. The reason lies in the policy of writing off large amounts for depreciation. Reserves which were $52,481,481 in 1922 have grown to $83,896,762. The Brazilian Company itself has no funded debt, the items which total $67,692,707 being the bonds of subsidiaries such as the Rio Tramways and São Paulo Electric Company. Sir Alexander MacKenzie, president of Brazilian and subsidiary companies, says in his report that Rio de Janeiro and São Paulo, the two principal cities which the company serves with transportation, electricity for heat and for power, have become the two principal industrial centers of South America, largely by reason of their abundance of cheap power and other modern facilities.

Proposed Co-ordination of London Passenger Services

The Automobile Association is carefully studying the proposed extension of the present London Traffic Combine to include under one management all the passenger services of the metropolis, including railways, omnibuses and tramway systems.

Considerable publicity has already been given to the advantages of the scheme as viewed from the standpoint of those whose interests are directly concerned in the furtherance of this project, but the Automobile Association takes the view that there is another angle from which these proposals have yet to be carefully analyzed.

In the absence of full particulars of this new "grouping" scheme, it is obviously impossible to express any definite opinions, but should a legislation be introduced to give effect to the scheme as at present outlined, the Automobile Association will thoroughly examine the proposals and, through the medium of the motor legislation committee, take such action as may be necessary to safeguard the interests of the owners of private motor vehicles.

New Swiss Electrically Operated Cable Railway

Work has commenced on the construction of a new electrically operated cable railway between Lake Traub and Gerschnialp, near Engelberg, Switzerland. The line is being constructed on the Bleichert system. The difference in altitude between the upper and lower stations is about 6,560 ft., which it is expected will be covered in ten minutes.

Electrification Extended by Mexican Railway

Officials of the Mexican Railway, Ltd., have completed arrangements for the extension of the electric zone now operating over the Maltrata Incline eastward to Paso del Macho, a distance of about 22 miles. The most difficult portion of this grade section was converted to electrical operation in the latter part of 1924, and during the past year an additional 17 miles, fed from the single original substation, was placed in service.

Extension now under way will require an additional substation, which will be located at Portrero, a short distance east of Cordoba. Equipment for this extension will be supplied by the International General Electric Company. It includes line material and bonding and a complete 3,000-kw. substation, to contain two 1,500-kw., 3,000-volt synchronous motor-generator sets with transformers, switchboards and switching equipment. This station will be a duplicate of the present substation except in capacity.

When this extension is completed there will be a total of about 70 miles of electrified track running through the severest grade section of the line between Mexico City and Vera Cruz. Grades run as high as 5.25 per cent maximum, with an average of 4.7 per cent for about 25 miles. The remainder of the electric

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zone ranges from 2 to 3 per cent. All trains on these grades will be handled with regenerative electric braking and it is expected that the same 150-ton locomotives used on the original electric zone will be used on the extension.

Power is to be supplied over a new transmission line from the Toxpango power plant of the Puebla Tramway, Light & Power Company, giving a reliability of service equal to that now being obtained by the original station at Maltrata.

The overhead line will be supported entirely by steel structures fabricated from used rails which the company has on hand. Due to the circuitous route followed by the railway tracks, the entire 70 miles will be fed from two substations. The motive power for the electric zone includes ten locomotives of the six-axle type, with a normal hourly rating of 2,700 hp. These have been in service since 1924.

Coventry Shows Profit on Buses

The annual report of the Tramways and Motor Omnibus Department of the city of Coventry, England, for the year ended March 31, 1927, shows a net deficit of £5,226, after interest and sinking fund payments on tramways, and a net profit of £9,851 for the bus system. The railway operating revenues for the year ended March 31, 1927, for the tramways were £97,256, and for the bus system £43,030.

Automatic Substations for Cape Town Suburban Railway

When the electrification now in progress on the Cape Town Suburban Railway is completed it will be the first line in South Africa to have all its substation equipment automatically operated and remote-controlled. The line runs from Cape Town to Simonstown, a distance of about 30 miles. It will have six substations, each of which will contain one or more pairs of 1,000-kw. rotary converters by which three-phase current at 33,000 or 12,000 volts from the Salt River power station will be converted to 1,500 volts direct current for operation.

The load dispatcher located at the central station will be able to start or stop the rotary converters at any of the substations and will be assured by means of visual indications that the machines have done what he wishes and are working properly. For this purpose, all-relay tandem supervisory system of power control of the General Electric Company of England has been adopted.

The twelve pairs of rotary converter sets, with automatic starting equipment, high-speed circuit breakers, etc., are being made at the company's Witton Engineering Works, Birmingham. Supervisory control equipment, really a telephone engineering job, is being supplied by the Peel Connor Telephone Works, Coventry.

Recent Bus Developments

Bus Purchase Approved

Indiana court sanctions plan of Indianapolis Street Railway to take over Peoples Motor Bus

Judge Harry O. Chamberlin in the Circuit Court in Indianapolis on Oct. 25 ordered the Indiana Public Service Commission to approve and authorize the purchase of the stock of the Peoples Motor Coach Company by the Indianapolis Street Railway for $500,000. The court also ordered the commission to approve the issue of $500,000 of securities, paying 8 per cent interest, to finance the purchase.

Incidentally the decision is the first of its kind in the state under a law passed by the last Legislature, which gives the right of appeal to the Circuit Court from decisions of the Public Service Commission. It seems unlikely the decision will be subjected to a test which would also serve to try out the validity of the law.

The ruling ends a controversy begun last April 16 by the railway during which the Public Service Commission twice refused to approve the bus company sale. The last refusal was appealed to the Circuit Court. Given an opportunity to change its stand after the hearing before the Circuit Court, provided by law, the commission a third time refused to sanction the purchase.

According to Robert I. Todd, president of the railway, the co-ordination of the transportation system in the city will mean better service. The bus lines, he declared, will be continued and enlarged, with bus service direct from outlying districts now served by railway feeder lines. Except in one or two cases where it is impossible, feeder lines will run to the downtown district instead of ending at the terminal of some car line as at present.

Cost of bus transfers will be reduced from 3 to 2 cents and it will be possible to transfer from a bus to a car line or vice versa.

The Public Service Commission objected to the purchase on the grounds that $500,000 was an excessive price to pay for the bus company and the 8 per cent interest rate was too high.

Informing the Public on Cars and Buses

The advantages of the street car and bus in one system are told by Thomas N. McCarter, president of the Public Service Corporation of New Jersey, in the Oct. 15 issue of *Forbes*. He makes it plain that the bus has achieved for itself a permanent place in the local transportation field, that its use is increasing rapidly and that it is popular with the traveling public.

In the same issue William A. McGarry tells the story of Joseph H. Alexander and his "give the car rider what he wants." Mr. Alexander is president of the Cleveland Railway, Cleveland, Ohio.

Taxicabs Restrained at Brockton Fair

On the petition of the Eastern Massachusetts Street Railway, Boston, Mass., the Suffolk County Superior Court has granted an injunction to restrain the Blue Ribbon Garage, Inc., of Brockton, from operating five taxicabs for five days during the Brockton fair between the railroad station and the fair grounds. The court finds that the garage cannot compete with a railway without complying first with the state laws as to license and the filing of bonds with the Public Utilities Department.

Buses Run Over Rail Route in Salt Lake City

Permission to discontinue railway service on its Holliday line, below 33d South Street, in Salt Lake City, Utah, and to substitute bus service has been granted the Utah Light & Traction Company by the Public Utilities Commission of Utah. The bus line will be operated over the same route and with the same frequency as the street cars are run at present, and the fares will remain the same. The order of the commission granting the applications of the company provides that a suitable comfortable and convenient passenger depot be provided by the company at or near its terminal at the intersection of 33d South Street and Highland Drive.

Reduced Tickets in Worcester to Induce Riding

Operating officers of the Worcester Consolidated Street Railway, Worcester, Mass., announce that the reason for the adoption of the reduced rate tickets by the company on some of the suburban motor coach lines which it operates is an effort to induce riding in the company's motor cars rather than in the family car. The reduction in rates is expected to encourage more general use of the motor coaches that ply between Worcester and the suburban towns.

The lines affected by the reduced rates include Worcester to Northboro, Marlboro line, Worcester and Shrewsbury and the Worcester, West Bolyston, Oakdale and Clinton route. The purchase of reduced rate tickets enables passengers on these lines to save about 20 per cent in fares. The fare unit for those who do not use the tickets is 10 cents for each zone.

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Fares a Factor on New Bus Line in District of Columbia

During a public hearing on an application of the Capital Traction Company, Washington, D. C., for authority to establish a new 25-cent de luxe motor coach line, operating from Cleveland Park to the heart of the business area, it was intimated that the railways of the district are planning to seek an increase in fare. William F. Ham, president of the Washington Railway & Electric Company, who appeared before the commission to oppose the creation of the new line, pointed out that the public desired better service, regardless of cost, but that the rate of fare now was too low to enable the companies to give better service. Mr. Ham's chief objection to the establishment of the new line was that it would compete with the Washington Railway & Electric Company's bus line in Cleveland Park. He said that that line had suffered a loss of $38,000 since its establishment.

Partial Substitution by Bus in Green Bay

Bus service will be substituted for railway service on the Mather Street car line in Green Bay, Wis., and for the interurban service on the line between the city of Green Bay and the village of Duck Creek about Nov. 1. The City Council of Green Bay recently granted the Wisconsin Public Service Corporation this permission for an eight months trial period. The company is positive that the patrons of these lines will be converted to the bus service during the trial and have purchased three Yellow Cab company buses at an expense of about $30,000.

Substitution in Troy

The Public Service Commission of New York on Oct. 11 approved the declaration of abandonment by the United Traction Company of that part of its railway line in Troy in Fifteenth Street between Hoosick and Congress Streets and also granted a certificate of convenience and necessity to the Capitol District Transportation Company, Inc., for the operation of a bus line in that part of Troy where the railway service is to be abandoned.

Muncie Operators Win Long Battle

Muncie, Ind., bus operators recently won a long legal battle with the Union Traction Company of Indiana when the Supreme Court of Indiana denied the petition for a rehearing asked by the railway company and made permanent an order restraining the Circuit Court at Anderson, Ind., from imposing fines on the bus operators for contempt.

The railway company, independent bus lines and the city have been in a three-cornered legal fight in numerous courts for nearly three years, the fight being filled with injunctions of assorted kinds, court decisions, ordinances, public service commission orders and certificates, with the net result that the public passenger vehicles of all those involved have continued to operate in spite of all commands and countercommands, and the further result that more buses are on the streets than are needed to care for the patrons.

New Rockford Company Would Oust Bus Concern

The Elgin, Belvidere & Rockford Railroad, Rockford, Ill., which has been granted a permit to operate bus lines between South Beloit and Elgin, Ill., is expected to take legal action seeking revocation of the permit held by the Royal Rapid Transit Company, which operates buses over the same route. The case will be followed with interest by traction line heads and bus operators throughout Illinois as a precedent for future relationship between traction and bus interests. The Illinois Supreme Court in a recent Joliet case indicated that traction or steam lines in any territory have first call upon the right to establish bus services in their territory and that coach lines are not favored in the field until the established companies relinquish their claim to bus service.

Anderson Company Appeals Bus Permit

Formal notice that an appeal will be taken from a recent order of the Indiana Public Service Commission granting a certificate of public convenience and necessity for an Indianapolis-Elwood bus line to Ovid N. Hesler of Elwood has been filed with the commission by Arthur W. Brady, receiver for the Union Traction Company at Anderson. The appeal will be made to the Circuit Court at Anderson.

Bus Replaces Stub Line

The Portland Electric Power Company, Portland, Ore., has installed one of its standard buses to take the place of the stub line that ran east from 82d Street and Sandy Boulevard to Park Rose. The railroad was constructed about nineteen years ago by a real estate firm to help develop its land holdings, and the realtors have operated it up to the present time. It was recently decided by the County Commissioners that Sandy Boulevard should be widened east of 82d Street; this necessitated either the paving of the right-of-way or abandoning the whole proposition. The paving and maintenance would be too great, so it decided to turn it over to the Portland Electric Power Company, which will remove the tracks and maintain the bus service. The rate of fare is the same as before, except that employees' tickets will be good on this bus the same as in other parts of the city.

Purchase of West Virginia Lines Announced

Bus lines between Morgantown and Uniontown and Morgantown and Laurel Iron Works, on Lake Lynn, were purchased by the Monongahela Transport Company, subsidiary of the Monongahela West Penn Public Service Company, on Oct. 4. The lines were purchased from Frankhouser and Clark, Morgantown men, who have operated them for some time, and the purchase included considerable equipment, which will be added to the company's garage facilities. Operation of the lines will be under the supervision of Bailey A. Hupp, superintendent of the subsidiary company.

Buses May Replace Cars on Line in Toledo

The Toledo, Ohio, City Council voted to remove the entire tracks on Indiana Avenue between Washington Street and Brown Avenue except the downtown loop—following a four-year fight on the matter, during which time sentiment of property owners and car riders changed considerably. The removal of the tracks will make possible the repaving of the street.

The plan is regarded favorably by the Community Traction Company, as it removes an old parallel line in a territory adequately served by other lines. However, the railway company may put on auxiliary bus service in the district if it is required.

Lawton-Fort Sill Railway Gives Up in Favor of Buses

The Lawton-Fort Sill Street Railway, built in 1914 to connect Fort Sill and Lawton, Okla., ceased operation on Oct. 15. The project will be abandoned until the system is refinanced from fresh capital, it was said. Bus lines running between Lawton and the military post will succeed the cars. During the war the railway carried capacity loads of soldiers. Of late years the cars have been patronized only by a few. The line has not been able to earn a return for its owners for several years.

ORANGE LINES REPORTED SOLD.—The Orange Coach Company, operator of nine buses between Maplewood, N. J., and New York City, is reported to have been sold to the Public Service Transportation Company, Newark, a subsidiary of the Public Service Corporation of New Jersey.

TO EXTEND SERVICE TO BEACH.—The Connecticut Public Utilities Commission has ordered the Connecticut Company to supply bus service to the residents of Sound Beach. To accomplish this the company will have to extend its bus line from Laddin's Rock Corner to Adam's Corner. It was recently granted permission to discontinue railway service in this section.

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Financial *and* Corporate

Jitney Elimination a Factor in Increased Revenues in Savannah

Receipts of the transportation department of the Savannah Electric & Power Company, Savannah, Ga., for the year ended Dec. 31, 1926, were $813,500. Revenue from both railway and bus operations increased 20.6 per cent. Approximately two-thirds of this was the result of the elimination of jitneys, which ceased operation on Jan. 1, 1926. This was the opinion of Howard C. Foss, president of the company, expressed in his annual report to the stockholders. The balance of the increase could be attributed to the growth of the community.

Operating statistics for 1926 compared with 1925 showed 113 passenger cars in service in 1926, and the same number in 1925; miles of track 62.6 in 1926, and 63.7 in 1925. Buses operated last year numbered four against three in 1925. There were 11,861,659 passengers carried in 1926 against 9,845,762 in 1925. No separate statement covering railway operation in detail was contained in the announcement to the press on which this account is based.

First Kansas City Dividend

The Kansas City Public Service Company, Kansas City, Mo., has declared an initial dividend of $1.75 a share on series A preferred stock. Voting trustees have fixed Oct. 31 as the record date for certificate holders entitled to the dividend, which will be distributed on Nov. 10.

Save Hocker Line from Junkpile

The Hocker line, known officially as the Kansas City, Lawrence & Topeka Electric Railroad, has been saved from the junkpile. At a meeting of 66 residents of communities along the line, in the Shawnee rural high school in Merriam, Kan., Oct. 20, it was agreed that the residents would raise $35,000 by Jan. 5, 1928, to purchase the road from the Sonken-Galamba corporation. In addition to the payment of $35,000, the Sonken-Galamba interests will accept $15,000 in stock in the line. Service, which was suspended on July 31, will be resumed within 60 days.

Committees have been named to raise funds for purchasing the line. Subscriptions will be taken from residents of Shawnee, Merriam, Rosedale, South Park and other communities bordering the Hocker line. Articles of incorporation will be filed at the state Capitol at Topeka for the formation of a stock company with the raising of money for the purchase of the controlling interest in the line. It was planned during the meeting to vote a subsidy of township bonds to repay the subscription raised to purchase the electric line. In case it does not pay for its operation the plan is to place bonds on the market and induce outside capital to finance the road's operation.

The Kansas City Public Service Company will operate the Hocker line for residents at 25 cents per car-mile. The agreement to be made with the Kansas City Public Service Company is termed a sympathetic one in order to allow residents a tram outlet to Kansas City and at the same time to act as a feeder to local city lines of the Kansas City Public Service Company.

Partial Abandonment in Loop Authorized

Permission to abandon its rails and service for four blocks in the loop to the Burlington and Union Pacific passenger station in Lincoln, Neb., was granted the Lincoln Traction Company recently by the Nebraska Railway Commission. Although the company had asked for complete abandonment of the loop the commission held that as the present type of bus was impractical to handle travelers with hand baggage the company would have to continue to send a shuttle car and one of the Sumner cars there on a ten-minute service. It was because of a large expenditure needed to bring the cars and paving to grades to correspond to those of the railroad station being completed that the company sought this abandonment.

Interborough Surplus $9,362,346

Earnings statement for year ended June 30 shows increase in gross revenue and operating expenses with drop in net corporate income

GROSS operating revenue of the Interborough Rapid Transit Company, New York, N. Y., for the year ended June 30, 1927, was $63,316,088, compared with $61,708,814 last year, a gain of $1,607,273, the result of a gain on the subway division of $1,152,761, and a gain on the Manhattan railway division of $454,512. The gain in the revenue from the transportation of passengers was $2,158,080 and the loss in the other street railway operating revenue $550,807, principally from advertising, which shows a decrease of $597,191.

Operating expenses with maintenance and depreciation included on the basis of contractual provisions were $35,575,666, compared with $33,540,813 last year, an increase of $2,034,853, the result of an increase of $1,207,890 on the subway division and an increase of $826,963 on the Manhattan railway division.

The net operating revenue was $27,740,422, compared with $28,168,001 last year, a decrease of $427,579, the result of a loss on the subway division of $55,129 and a loss on the Manhattan railway division of $372,450.

The total amount of taxes was $3,506,823, compared with $3,350,783 last year, an increase of $156,040; the subway division shows an increase of $162,323, while the Manhattan railway division shows a decrease of $6,283, or 0.26 per cent.

Income from operation was $24,233,600, compared with $24,817,219 last year, or a decrease of $583,619, the result of a loss on the subway division of $217,452, and a loss on the Manhattan railway division of $366,167.

Non-operating income was $257,176, against $276,980 last year, a decrease of $19,804, the result of a decrease on the subway division of $10,278, and a decrease on the Manhattan railway division of $9,526.

Gross income was $24,490,775, compared with $25,094,198 last year, a decrease of $603,423, the result of a loss on the subway division of $227,730, and a loss on the Manhattan railway division of $375,693.

Income deductions were $21,540,066, compared with $21,669,158 last year, a decrease of $129,092.

The net corporate income was $2,950,709, compared with $3,425,040 last year, a decrease of $474,331.

Some $11,657,966 was spent during the year for maintaining the railroads, power plants and the rolling stock. This amount was $1,479,821 in excess of the contractual provisions and when de-

COMPARATIVE INCOME ACCOUNT OF INTERBOROUGH RAPID TRANSIT COMPANY

Year Ended June 30	1927	1926
Gross operating revenue	$63,316,087	$61,708,814
Operating expenses	35,575,665	33,540,812
Net operating revenue	$27,740,422	$28,168,001
Taxes	3,506,822	3,350,782
Income from operation	$24,233,599	$24,817,218
Non-operating income	257,175	276,979
Gross income	$24,490,775	$25,094,198
Income deductions	21,540,066	21,669,158
Net corporate income	$2,950,708	$3,425,040
Add:		
Surplus at beginning of year	$4,968,768	$1,529,863
Profit and loss account—net changes during the year*	1,442,868	13,865
Totals	$6,411,637	$1,543,728
Surplus at end of year †	$9,362,346	$4,968,768

* Due principally to adjustment of subway division federal income tax accruals for years 1917 and 1918.

† Stated exclusive of accruals under Contract No. 3 and related certificates payable from future earnings and exclusive of expenditures for maintenance in excess of contractual provisions.

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ducted from the net corporate income leaves a balance for the year of $1,470,888, compared with $2,443,695 the previous year.

The number of passengers carried was 1,173,646,256, compared with 1,130,484,647 last year, an increase of 43,161,609,, the result of a gain on the subway division of 30,346,523 and a gain on the Manhattan railway division of 12,815,086.

The cost of transportation, which includes the cost of power station coal during the year, was $1,495,720 more than the previous year. Of that amount $967,876 is incident to the strike of July, 1926, leaving an increase in the ordinary transportation expenses of only $527,844 for the year, notwithstanding the operation of 3,553,834 additional car-miles and an increase of 5 per cent in wages effective April 1, 1927.

A net expenditure of $1,425,160 was made during the year for additions, betterments and replacements. This amount includes the company's contribution toward construction and equipment under Contract No. 3 and the related certificates, as well as additions thereto.

The system is made up of 388 miles of single track, of which 249 is subway division, built under Contract Nos. 1 and 2, extension to 148th Street, and Contract No. 3, and 138 comprises the total Manhattan division.

The comparative income account for the years ended June 30, 1927, and 1926, is shown on page 841.

Abandonment of California Branch Line Authorized

Permission has been granted by the Railroad Commission to the Key System Transit Company, Oakland, Cal., to abandon operation of its San Lorenzo branch line between the junction of said branch line with the Oakland-Hayward line and San Lorenzo junction. The applicant showed that the earnings of this line have averaged $220 a month, while the cost of operation has been approximately $1,035 a month, a loss that the utility cannot continue to absorb.

Net of New York & Queens County Railway Increased

The New York & Queens County Railway, Long Island City, N. Y., reports earnings as shown in the following table:

Results for Calendar Years:	*1926	*1925	*1924
Revenue from transportation	$660,811	$687,512	$696,898
Other street railway operating revenue	114,904	160,351	19,961
Total	$775,715	$847,863	$716,859
Operating expenses	626,804	687,939	580,181
Taxes	33,156	35,921	39,401
Income from operations	$115,755	$124,004	$97,277
Non-operating income	6,809	5,055	2,665
Gross income	$122,563	$129,059	$99,942
Interest deductions—unpaid taxes	2,452	8,749	16,297
Other rent deductions	3,097	9,841	11,542
Net corporate income	$117,013	$110,469	$72,103

* Receiver's operations only.

Balance of $1,011,383 in Denver

The statement of earnings and expenses of the Denver Tramway Corporation and the Denver & Intermountain Railroad (with intercompany transactions eliminated) and direct debits and credits to surplus for the twelve months period ended Dec. 31, 1926, is as follows:

Total operating revenue	$4,565,251
Less operating expenses and taxes:	
Operating expenses (not including depreciation)	2,452,131
Taxes	543,029
Total operating expenses and taxes	$2,995,160
Net operating income	$1,570,090
Total miscellaneous income	54,497
Gross income less operating expenses and taxes	*$1,624,588
Deductions from income:	
Interest of underlying bonds	249,959
Balance	†$1,374,629
Interest on general and refunding bonds	322,175
Balance	$1,052,454
Less net profit and loss charges (including $40,750 appropriated to Insurance Fund to enable corporation to carry part of its fire insurance)	41,071
Balance available for depreciation and for dividend requirements on 104,164 shares of preferred stock	$1,011,383

* Equals 6.50 times interest on underlying bonds.
† Equals 4.27 times interest on general and refunding bonds.

Engineers Public Service Increases Directorate

Frank L. Babbott and Edwin S. Webster, the latter president of Stone & Webster, Inc., have been elected additional directors of Engineers Public Service Co., Inc., increasing the directorate to nineteen members. Mr. Webster was one of the original directors, but resigned just before taking an extended trip abroad.

The Engineers Public Service Company controls various utility corporations, including electric railways, under executive management of Stone & Webster.

Deficit in Portland, Me., Continues

For the year ended Dec. 31, 1926, the gross income of the Portland Railroad, Portland, Me., leased by the Cumberland County Power & Light Company, was $1,402,767, compared with $1,451,902 for 1925. Operating expenses and taxes were $1,183,031, against $1,178,574 for the year previous. A deficit of $27,862 is compared with a net income of $25,730 in 1925. After the consideration of dividends, operation in 1926 resulted in a deficit of $127,812, against a deficit of $74,220 in 1925.

The annual statement to the stockholders says that in spite of the increased deficit from the operation of the railroad property the company's earnings for the year showed an increase for dividends after deduction of $370,200 for depreciation reserve, of which $120,000 was applicable to the railroad property.

Would Abandon California Line

The Central California Traction Company has applied to the California Railroad Commission for permission to abandon its Sunnyside line from the intersection of Cherokee Lane to the intersection of Park and Ophir Streets in the city of Stockton. It is the claim of the company that the revenue from that line is inadequate to pay the expense of operation.

Interstate Would Sell Common Stock

In a petition filed with the Indiana Public Service Commission the Interstate Public Service Company, Indianapolis, Ind., asked authority to issue and sell 3,333 shares of no par value common stock to raise approximately $250,000 for refunding purposes. The securities issue is sought in connection with the purchase of the New Albany Street Railway on Oct. 30, 1925, and is also intended to reimburse the Interstate's treasury for money applied to refund bonds that fell due Aug. 1, 1927.

Oregon Line Buys Steam Property

The Portland Electric Power Company bid in the Willamette Valley Southern Railroad for $272,000 at public sale on Oct. 17. There was a judgment for $1,000,000 held against the railroad for power, materials and work furnished in the last twelve years. The Portland Electric Power Company will continue to operate the railroad as usual for passenger service between Oregon City and Molalla and for operations of the Eastern & Western Lumber Company.

London Shareholders Ratify Conversion Plan

Speyer & Company have been advised that the shareholders of the Underground Railways, London, England, have ratified the readjustment plan whereby holders of 6 per cent income bonds are to receive the option to convert their bonds into fully paid £1 ordinary shares of the company.

The plan provides that the bonds may be converted at any time before July 1, 1930, at the rate of £1 fully paid ordinary share for every £1 1s. face amount of bonds. Income bonds may be deposited in New York for the exercise of the conversion privilege.

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COMPARATIVE STATEMENT OF THE OPERATING RESULTS OF THE LONDON UNDERGROUND GROUP, YEAR 1926, COMPARED WITH 1925

	Railways		London General Omnibus Company, Ltd.		Total	
	1926 £	Increase £	1926 £	Increase £	1926 £	Increase £
Traffic receipts, after the operation of the common fund under the terms of the London Electric Railway Companies' facilities act agreement, dated Dec. 21, 1915, and supplemental agreement, dated Dec. 8, 1921	4,825,914	226,297	8,371,713	*272,322*	13,197,627	*46,025*
Expenditure	3,007,896	168,114	7,998,915	*249,558*	11,006,811	*81,444*
Net receipts	1,818,018	58,183	372,798	*22,764*	2,190,816	35,419
Miscellaneous receipts (net)	537,699	33,447	389,411	59,519	927,110	92,966
Net income	2,355,717	91,630	762,209	36,755	3,117,926	128,385
Interest, rentals and other fixed charges	1,222,620	116,399	234,335	20,011	1,456,955	136,410
Balance	1,133,097	*24,769*	527,874	16,744	1,660,971	*8,025*
Appropriation to reserve for contingencies and renewals	155,000	.....	325,000	25,000	480,000	25,000
Balance	978,097	*24,769*	202,874	*8,256*	1,180,971	*33,025*
Dividends on guaranteed and preference stocks	389,477	.....	.....	.....	389,477	.....
Balance	588,620	*24,769*	202,874	*8,256*	791,494	*33,025*
Add balance from last year's accounts	257,673	9,286	67,501	6,999	325,174	16,285
Total amount available for dividends on ordinary stocks and shares and for other purposes	846,293	*15,483*	270,375	*1,257*	1,116,668	*16,740*
Dividends on ordinary stocks and shares	604,103	.....	206,250	2,119	810,353	2,119
Rate per cent per annum	3.54	.....	6 (Free of tax)	.....	4.09	.....
Balance carried forward to next year's accounts	242,190	*15,483*	64,125	*3,376*	306,315	*18,859*

London Underground Railways and General Omnibus Company Report Year's Operations

London underground railways lost 9,000,000 passengers last year despite the fact that 7 additional route-miles was opened for traffic in September. Report of the last annual joint convention of the London Underground Railways and the General Omnibus Company as reviewed by Lord Ashfield, Feb. 24, showed that there was an increase in bus traffic of 13,000,000 passengers; this increased carriage was provided for by 59 additional miles of road. During the year 112 additional cars were purchased for the tube railways. Operation costs per mile on railways has been reduced 1½ per cent, while cost of bus operation amounted to 3½ per cent reduction.

The combined companies have obligated themselves to spend £25,000,000 on improvements and extensions since the year 1918.

Expenditures influencing the cost of operation were, according to the report, costs of coal, amounting to £144,000; £57,000 was incurred during the general strike; loss of £339,000 was due to labor troubles, and the burden of taxation, which included £400,000, compared to £330,000 the preceding year. Contribution of seven-tenths of a penny now is paid for every mile run by buses, including also the company's share of road maintenance. Burdens laid by Parliament on this group of companies last year amounted to £711,000, equal to 5 per cent of the gross receipts and to 88 per cent of the amount distributed in dividends on ordinary stocks. Of this sum, £589,000 was required to meet taxation in the strict sense. The balance was represented by contributions toward health, pensions and unemployment. About one-fifth of the amount distributed in dividends had to be paid in income tax, so that the ordinary shareholders received not more than £648,000, while the government received £751,000.

Bus service was restricted last year because of the order of the Ministry of Transport to the General Omnibus Company to withdraw 45 buses from its main routes. These buses, however, have been put in operation on routes new and not much used. Of all the routes worked in 1926, 87, or 29 per cent, did not earn sufficient to pay expenses including depreciation and renewals. The company also has acquired controlling interests in several of the smaller lines and is gradually consolidating them.

Operating data on the London Underground group are shown in the accompanying statements.

MISCELLANEOUS STATISTICS OF LONDON UNDERGROUND GROUP, YEAR 1926, COMPARED WITH 1925

	Total Railways		London General Omnibus Company, Ltd.		Total	
	1926	Increase	1926	Increase	1926	Increase
Passengers carried:—						
Ordinary	210,470,208	*7,444,288*	1,249,353,228	12,805,475	1,459,823,436	5,361,187
Workmen	50,580,564	*836,422*	.....	.....	50,580,564	*836,422*
Seasons	48,727,502	*642,856*	.....	.....	48,727,502	*642,856*
Total	309,778,274	*8,923,566*	1,249,353,228	12,805,475	1,559,131,502	3,881,909
Average daily number of passengers carried	921,573	*21,332*	3,712,788	54,363	4,634,361	33,031
	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.
Route-miles owned or leased†‡	78 62	6 59	... ..	.. ..	78 62	6 59
Route-miles run over by companies' trains	128 22.5	6 59	... ..	.. ..	128 22.5	6 59
Road-miles run over by company's omnibuses	... ...	.. ..	860 0	59 0	860 0	59 0
Number of stations	125	7	.....	.....	125	7
Number of garages	.....	.....	44	1	44	1
Number of lifts	171	*14*	.....	.....	171	*14*
Number of escalators	63	23	.....	.....	63	23
Number of car-miles run in relation to passenger receipts	65,398,129	*38,584*	138,784,175	*5,159,026*	204,182,304	*5,197,610*
Number of car-miles run by companies' trains or omnibuses	72,307,654	*563,983*	138,784,175	*5,159,026*	211,091,829	*5,723,009*
Number of cars or omnibuses owned	1,770	182	*3,935	*201*	5,705	*19*

† Includes 12 miles 49 chains run over the City & South London Railway (Euston to Morden).

‡ Includes 15 miles 48 chains run over the London Electric Railway (Kensington and Euston to Edgware and Highgate).

* The number of omnibuses owned and/or worked by or in conjunction with the London General Omnibus Company, Ltd., is 4,703, compared with 4,704 in 1925.

Italics denote decrease.

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Personal Items

A. C. Baker and T. Rowland Visit America

Two keen students of electric railway and bus transportation have completed a thorough study in this country of modern methods and equipment. They are A. C. Baker, chief engineer of the Birmingham Corporation Tramways, Birmingham, England, and his assistant, T. Rowland. These distinguished representatives of a large English tramway system arrived in New York on Oct. 1 and went immediately to Cleveland to attend the American Electric Railway Association convention. There they expressed themselves as much interested in the cars and buses that were on exhibition. While in Cleveland they also made an extensive inspection of the Cleveland Railway.

From Cleveland they went to Detroit, where under the direction of Charles F. Hewitt, staff engineer of the Detroit Municipal Railway, they inspected the cars and the buses in operation and studied the system of traffic control. Their next objective was Chicago, where they visited the shops of the Chicago Surface Lines and the Chicago Rapid Transit Company, as well as the Chicago Motor Coach Company's plant. Next on their route east they visited Buffalo and Boston and returned to New York on Oct. 18. In New York they studied railway and bus operation and as guests of L. H. Palmer, general manager of the Fifth Avenue Coach Company, they visited the new Holland Vehicular Tunnel from New York to New Jersey. Later they visited Philadelphia.

Martin Ackerman with Peoples Railway

Martin Ackerman has been appointed manager of the Peoples Railway, Dayton, Ohio, under control of the American Electric Power Company of New York, effective Oct. 17. Stevens & Wood are operating managers of this property.

Early in 1926 Mr. Ackerman, who was serving as general manager of the Cincinnati & Dayton Traction Company, resigned to become general manager of the Lake Shore Electric Railway, with headquarters at Sandusky. At that time the ELECTRIC RAILWAY JOURNAL commented upon the fact that Mr. Ackerman was returning to take charge of the property on which he had obtained his early electric railway experience. There he had served as a shop man and then as a trainman. In time he advanced to the positions of train dispatcher and trainmaster.

Early in his career Mr. Ackerman became connected with the Youngstown & Ohio River Railway, originally a steam line running between Washington and Salem, Ohio. Some four months later he assumed the general managership of the Springfield & Xenia Railway. He continued with this property, making it a paying proposition, which it had not been prior to his supervision, until 1914, when he took over the operation of the Interurban & Terminal Company of Cincinnati as general superintendent. He seemed to have the knack of converting losing ventures into paying ones, for here too a surplus in earnings was reported. Although this healthy condition did not last, due to war-time handicaps, his reputation had been made and he received the appointment of general manager of the Cincinnati & Dayton Traction Company in July, 1918.

Martin Ackerman

In the face of hard times and subsequent operation under a receivership Mr. Ackerman carried on and did a great deal to restore a property which was fast making for the rocks. The company has since been reorganized with a cut in debt from $4,900,000 to $1,300,000. He helped to pave the way for this happy result.

L. V. Sutton Promoted to Post in Mississippi

L. V. Sutton, former assistant manager of the Arkansas Power & Light Company, Little Rock, Ark., has been promoted to the position of vice-president and general manager of the Mississippi Power & Light Company. He has started on his new duties at Jackson, Miss. Mr. Sutton went to Little Rock in August, 1924, from Raleigh, N. C., where for twelve years he had served the Carolina Power & Light Company. Before that time he was connected with the General Electric Company at Lynn, Mass.

Mr. Sutton was born in Richmond, Va. He was graduated from the Virginia Polytechnic Institute, where he had majored in electrical engineering.

The Mississippi Power & Light Company operates 12 miles of line in Jackson, Miss., and 11 miles in Vicksburg. This company and the Arkansas Power & Light Company are controlled by the Electric Power & Light Corporation, New York, N. Y.

A. R. Koonce and Rex I. Brown Promoted in Arkansas

Some of the duties of L. V. Sutton, who recently left Little Rock, Ark., to assume new duties as vice-president and general manager of the Mississippi Power & Light Company, Jackson, Miss., will be undertaken by A. R. Koonce, superintendent of the Little Rock railway department of the Arkansas Power & Light Company. Mr. Koonce has been made general superintendent in direct charge of the railway department and will act in an advisory capacity for the Pine Bluff Railway system.

Twenty-six years ago Mr. Koonce entered the employ of the local railway company as a blacksmith's helper. He advanced through the various positions of night foreman, day foreman and master mechanic until in 1918 he was made superintendent of the railway department.

Vice-President Griffith, who gave Mr. Koonce his first position with this property, said that both he and R. I. Brown, who will cover the other duties of Mr. Sutton in the electric end of the business, were deserving of the promotions. Mr. Brown, who has been made assistant to Vice-President C. J. Griffith, directly in charge of the electric department, will continue his duties as commercial manager, as will Mr. Koonce continue in his present position in addition to taking on new duties.

A. W. McLimont Honored on Decade of Progress

To honor his ten-year service record with the Winnipeg Electric Company as general manager, a complimentary dinner was tendered to A. W. McLimont, president, by the supervisory employees of the company on Oct. 1. The dinner was held in the Royal Alexandra Hotel, Winnipeg, and was attended by the local directors. Speeches sketched the history of the Winnipeg Electric Company over the past ten years, indicating its progress in the capable hands of Mr. McLimont. Later Mr. McLimont was presented a silver loving cup as an expression of esteem by the members of his organization.

In addressing the happy gathering, Mr. McLimont said that there were three outstanding factors which had to be considered in connection with every problem which presented itself. The first one was public relations; second, capital, and, third, loyal labor. He said he believed the company today was on the threshold of a great development, that the growth of the company mirrored very clearly the future of the community. It was his desire that every employee should assist "in getting and maintaining the confidence of the public

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we serve—as well as capital and labor—in us and in our good intentions."

The occasion for honoring Mr. McLimont recalled to mind the comment on his progressive policy in big business which appeared in an article appreciative of Mr. McLimont in the *Canadian Financial Post* for June 24. His averting a threatened strike of the trainmen was said to be only one of the big steps he had taken in putting the company on a sound basis.

When Mr. McLimont was induced to go to Winnipeg the Winnipeg Electric Company was in a dangerous state of disorganization, confronted with labor troubles, producing no dividends, hampered by the provisions of an old franchise and its equipment in need of repairs and replacements. The hardest job was getting the old franchise adjusted on an equitable basis since the old franchise made no provision for the necessary increase in revenue. The adjustment was accomplished and then he set about the task of rearranging the company's labor program. His endeavors to make the organization satisfactory to the company, the men and the city, have met with no little success.

Harry L. Brown

Secretary of Ohio Brass Company and former editor of "Electric Railway Journal" died at Toledo on Oct. 23—Long a constructive force in industry and active association worker

HARRY L. BROWN, secretary of the Ohio Brass Company and formerly editor of the ELECTRIC RAILWAY JOURNAL, died at Toledo, Ohio, on Oct. 23. He was stricken with appendicitis while returning home to Mansfield after attending the Ohio-Michigan football game at Ann Arbor, and did not recover from the shock of the operation which it was deemed necessary to perform at once.

Harry Brown, as he was familiarly known, was a constructive force in the electric railway industry. This was true of his work as a member of the staff of the ELECTRIC RAILWAY JOURNAL, later as editor of this paper, and still later as an officer of the Ohio Brass Company. It is putting no strain on facts to say that he was a brilliant man. A brilliant man is ever aggressive—his mentality compels him to action. While he grapples friends to him with hooks of steel, he is very likely to be misunderstood by those who do not know him well and are given to judging superficially. It fell to Harry Brown's lot to be so judged on occasion because of his militancy as a journalist, but he and the paper he served had the satisfaction of seeing improvements made and of witnessing the carrying out of plans which the paper advocated.

The man had about him the air of the natural doer of deeds. He had small patience with mediocrity, and he despised complacency, neither of which has any place in the general scheme of things, and least of all in journalism. If it be a fault to be intolerant of these human but pernicious failings, then Harry Brown had that fault, but there was nothing hypercritical about it. If he did not spare others in the tasks which he allotted to them, he certainly did not spare himself. And never was that more evident than in his work as chairman of the subjects and meetings committee at the recent convention at Cleveland. Recognition of the ability of the man to get things done came to him again at the Oct. 6 meeting of the American executive committee, which reappointed him chairman of the committee on subjects and meetings for the year 1927-1928. Of the important work that he did for the Ohio Brass Company perhaps the most conspicuous was his contribution to its publicity and advertising activities.

Harry L. Brown

Great as was his service to the industry through his general activities in association affairs and in serving as a member of the American executive committee, none of the work of this kind that he did really overshadowed in its importance his contribution in 1924, along with Secretary Welsh and Harley Johnson, as a member of the committee on foreign practice. These men spread before the industry a summary of foreign practices with comment on the applicability of things being done in Europe for adoption in the United States. It was a difficult task done with celerity.

Conspicuous work by the man as Western editor of the ELECTRIC RAILWAY JOURNAL led eventually to the elevation of Harry Brown to its editorship on Jan. 1, 1923. As a field editor he had hitched his wagon to a star. He saw clearly—and, more important, journalistically—the place that the bus was to play in the transportation industry, appraised accurately the need for better public relations and for merchandising the service, and recognized that it was essential to modernize both railway plant and operation methods. In all he served the McGraw-Hill Publishing Company, Inc., ten years, starting as an editorial apprentice in the capacity of assistant editor *Electrical World* in 1915.

For two years after he was graduated from the University of Michigan and before taking up editorial duties he was engaged in engineering work with the Aurora, Elgin & Chicago Railroad and the Chicago Telephone Company. During the war he was first lieutenant and captain in the Signal Corps. He was born in Grand Rapids 38 years ago.

Many men prominent in the industry telegraphed expressions of sympathy to Mansfield.

E. F. Wickwire, vice-president Ohio Brass Company, voiced the sentiment of the other officers, directors and associates of Mr. Brown in the following words:

Expressions that have poured in from Harry Brown's host of friends testify eloquently to the magnitude of the loss which his passing occasioned. The sense of loss is doubly strong in us who have been so close to him.

Of him Lucius S. Storrs, managing director of the American Electric Railway Association, said:

It is difficult for me to realize that Harry L. Brown has passed on. Only yesterday he was applying his seemingly indefatigable energy to making the American Electric Railway Association convention a success. And only the day previously, it seems, he was using his great editorial ability in fighting for the progressive things in local transportation. He will be missed wherever local transportation exists, because everywhere in it there are forward steps directly traceable to his efforts. But most of all he will be missed as a charming and congenial friend.

J. W. Welsh, secretary of the American Electric Railway Association, said:

I came to know Harry Brown rather intimately as a member of the association's committee on foreign operation that studied transportation problems in Europe in 1924. He was a keen observer. He had a clear appreciation of relative values and a happy way of expressing himself in his writings. For years he has been an active worker in the association and has been a member and chairman of its most important committees. He was a leader among those who were thinking along modern and progressive lines. His loss will be very keenly felt.

James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, said:

Harry L. Brown, in addition to his personal charm and rare ability, had many of the qualities of leadership. He did not shy at a new idea. Still more important, he never counted the cost to himself of the work involved in carrying out any project upon which he launched. His work in journalism, exacting as it was, proved this, as well as did his work in other lines, par-

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ticularly his activities in behalf of the American Electric Railway Association. In voicing my own sense of loss at his passing, I know that I express the sentiments of all the officers of the McGraw-Hill Publishing Company, Inc., and more particularly the sentiments of the members of the staff of the ELECTRIC RAILWAY JOURNAL, which he served loyally and faithfully. His was a constructive influence the industry can ill afford to lose.

Funeral services were conducted at his late home in Mansfield on Wednesday morning. The pallbearers were Messrs. Sawyer, Bozell, Wickwire, Mason, Jameson and Huntington. Later the remains were taken to the home of Mr. Brown's parents in Grand Rapids, Mich., where brief services were held Thursday morning. The interment was in the family plot at Fuller Cemetery, near Hastings, Mich. He is survived by his father, mother, wife and two children.

JOHN R. H. STALEY, right-of-way expert for the Public Service Company of Northern Illinois, died on Sept. 13 in Joliet, Ill., two years after his retirement from active duty. He went to Joliet 42 years ago and began as lineman for the old Economy Light & Power Company. Later he was advanced to superintendent, which position he held when the company was absorbed by the Public Service Company.

C. F. MCELROY, instrumental in the organization of the Carthage Electric Railway Company, Carthage, Mo., which built and operated the Carthage to Carterville line, died recently. He was secretary of the company and continued in that capacity until the consolidation of the line as a part of the Southwest Missouri Railroad. Mr. McElroy was 79 years old.

GEORGE ST. PIERRE, retired superintendent of equipment of the Key System Transit Company, Oakland, Cal., died recently as a result of injuries sustained in an auto accident in Walnut Creek, Cal., on Oct. 13. When he retired from the Oakland System in the spring of 1925 he had been connected with the local railway for 39 years. Mr. St. Pierre went to California from Montreal, where he served his apprenticeship as marine machinist.

PERLEY F. WALKER, dean of the School of Engineering of the University of Kansas, Lawrence, Kan., since 1913, committed suicide Oct. 17 in his office at the university. He was a national figure in engineering circles. Dean Walker was the author of "Management Engineering," published by the McGraw-Hill Book Company, and had contributed articles on various topics to the technical press. He served as president of the Society for the Promotion of Engineering Education in 1923-1924, was a past-president of the Kansas Engineering Society and a member representative of the American Society of Mechanical Engineers on the American Engineering Council. Dean Walker was born in Embden, Me., in 1875.

Manufactures *and the* Markets

Improvements of Over a Million by Altoona & Logan Valley

The Altoona & Logan Valley Electric Railway, Altoona, Pa., it is reported has completed a three-year program of track building, new car purchase and general improvement at a total cost of $1,047,946, as follows:

The installation of new track, paving and drains under the tracks cost $533,435; safety and efficiency equipment for street cars, $45,376; thirteen steel-body, light-weight, double-truck safety cars purchased new, $212,065; rebuilding three single-truck safety cars, $13,464; substation equipment and distribution lines for power, $74,867; a bridge construction job, $42,794; conveyance, electric welders, telephone lines and signals, $32,095; five auto buses, 21-passenger style, $31,435; two other buses for use at Tyrone, $12,469; two additional buses in use in Altoona, $11,000, and the building of a new garage to house 25 buses, $38,942.

Carolina Company Awards $96,300 Contract for Carhouse

Contract for construction of the Carolina Power & Light Company's new carhouse in Asheville, N. C., has been awarded to the Palmer-Spivey Construction Company, Charlotte and Asheville, on a bid of $96,300. The building is to be a two-story fireproof structure and will contain space for storage of the company's street cars and buses. Installation of track and other equipment for the structure will make the cost of the plant approximately $175,000.

Basic Bessemer Process Dropped from British Rail Specifications

The British Engineering Standards Association has decided to remove all reference to basic bessemer process from specifications for bull-head and flat-bottom rails, the use of this process being no longer in accord with British practice.

Big Track Job Under Way by Los Angeles Railway

The engineering department of the Los Angeles Street Railway, Los Angeles, Cal., has started work on the renewal of a crossing at Macy and Alameda. It is also engaged in a complete reconstruction of track with 116-lb. girder rail on Pasadena Avenue between Avenue 18 and San Fernando Road. Work is now in progress, it is reported, on the largest track job which the company has ever undertaken, the complete reconstruction of track on San Pedro Street from Ninth to 36th Street. New 116-lb. steel girder rail will replace the old 60-lb. rail, with a view to providing more comfort for passengers and smoother riding. The roadbed is rock-ballasted with drain tile on both sides and 8-in. concrete paving with asphalt surface is used. The job will cost $200,000.

General Electric Exhibiting Great Northern Electric Unit

The largest motor-generator type electric locomotive in the world, one of four being built by the General Electric Company for the Great Northern Railway for hauling passenger and freight trains through the new 7¾-mile tunnel piercing the Cascade Mountains, is being exhibited during this month at cities along the Great Northern road. Some of the main specifications of these units follow:

Total weight	518,000 lb.
Weight on drivers	409,800 lb.
Length over couplers	73 ft. 9 in.
Length of wheel base	58 ft. 8 in.
Number of driving axles	6
Number of guiding axles	2
Diameter of driving wheels	55 in.
Diameter of guiding wheels	36 in.
Number of motors	6
Speed continuous rating	18.7 m.p.h.
Maximum speed	50 m.p.h.

Large New England Contract for English Electric Company

The English Electric Company has obtained a contract for complete electrification of the railway from Christchurch to Lyttleton, New Zealand, at a cost of about £100,000. The order includes 45 miles of overhead line material, six 1,500-volt locomotives of the four-axle type, 3 ft. 6 in. gage, each machine weighing 50 tons, and a substation plant. There is only one substation, and it is arranged for remote control. It will be supplied with three-phase current at 10,500 volts, 50 cycles.

G. E. Directorate Inspects Fort Wayne Plant

The entire board of directors of the General Electric Company was in Fort Wayne, Ind., Oct. 14 for a business meeting and an inspection of the Fort Wayne works of the company. Those attending were: Gerard Swope, president, of New York City and Schenectady; Jesse R. Lovejoy, New York, vice-president; George F. Morrison, vice-president, and Owen D. Young, chairman, both of New York; E. Wilbur Rice, Jr., honorary chairman, of New York and Schenectady; Oliver Ames, Gordon Abbott, Robert Treat Paine II, George P. Gardner, Philip Stockton, Francis L. Higginson, all of Boston; Marsden J. Perry, Providence, R. I.; Bernard E. Sunny of Chicago; Burton G. Tremaine of Cleveland; Mel-

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vin T. Traylor of Chicago; Henry M. Robinson of Los Angeles; George F. Baker, Jr., Seward Prosser, Dwight W. Morrow and Clarence N. Woolley, all of New York City. Several of these men have visited the Fort Wayne works on various occasions before, but this is the first time the entire board has assembled in the city.

Worcester's Railway Rehabilitation Program Shows Large Expenditure

The rehabilitation program of the Worcester Consolidated Street Railway, Worcester, Mass., has cost approximately $1,510,848 in the first nine months of this year, according to officials of the company, it is reported. The New York, New Haven & Hartford Railroad, when it resumed control of the franchise, it is understood, promised to expend $1,000,000 in rehabilitating the road. One of the major items of expense was the purchase of 50 new cars from the Osgood-Bradley Company of Worcester at a cost of $708,550. A description of these units and the ceremony attendant upon the official demonstration trip of the first of them appeared in an article in the JOURNAL Oct. 1. All but three of these cars have been delivered.

The new carhouse at Grove Street, Worcester, will represent the expenditure of $250,000 when completed and $75,000 has already been spent in building a new garage for buses. Sixteen new buses have been purchased at a cost of $149,500. Car route numbers have cost $15,000. Other expenditures included a new automobile truck at a cost of $4,800 and special line work $18,164. On Oct. 1 $209,834 had been spent for track construction, with the end of the program in this direction not yet in sight.

National Power Show Scheduled for Dec. 5-10

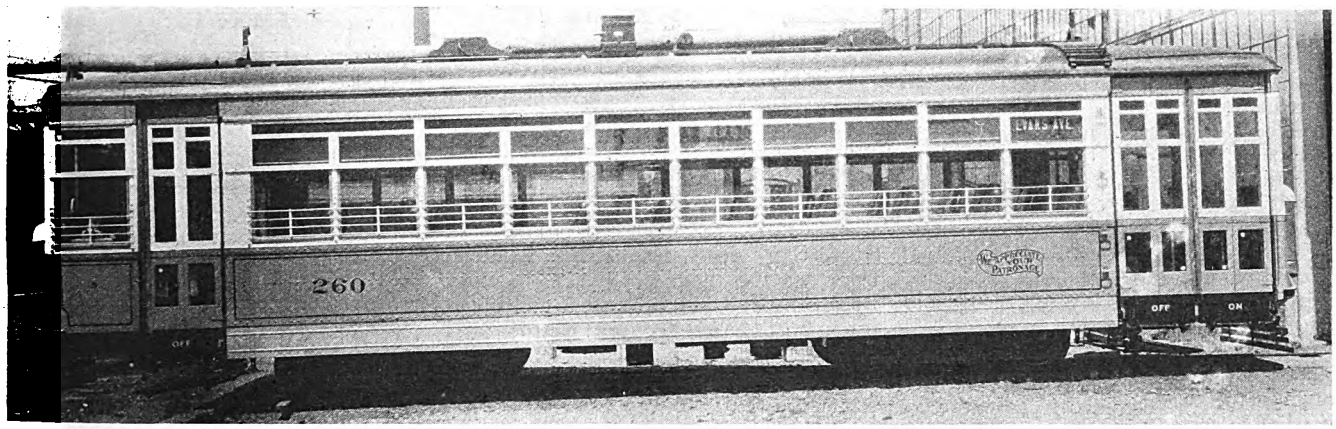
The sixth National Exposition of Power and Mechanical Engineering will be held at the Grand Central Palace, New York, from Dec. 5 to 10 inclusive, and at the same time as the exposition is held the annual meetings of the American Society of Mechanical Engineers and American Society of Refrigerating Engineers will be held. Numerous other organizations will meet at the same time as the exposition; some of these will meet jointly with, or in bodies attend, the exposition.

Quiet Week in Metal Markets

The extreme activity in buying of copper and lead apparently ran its course last week and the week ended Oct. 26 has been a quiet one in the nonferrous metal markets. Buying of copper has been particularly dull, whereas there was a little more activity in zinc than in the preceding week. Prices have tended toward lower levels, zinc suffering particularly in this respect.

The copper market has again relapsed into a condition of stagnation such as existed prior to the wave of buying that took place last week. As before, the leading producers are almost uniformly holding at 13.25 cents, at which level only scattering sales have been made and these in small tonnages. Export

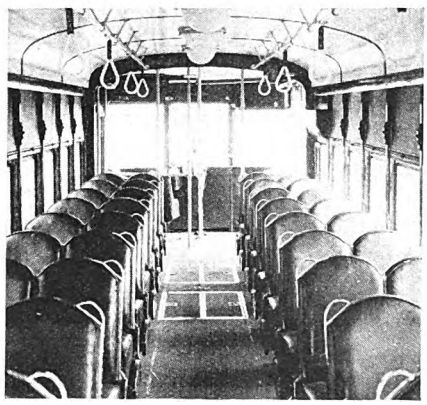
Ten Units for Northern Texas Traction Company



Exterior of one of the ten units for the Northern Texas Traction Company

Specifications have recently been released by the Northern Texas Traction Company, Fort Worth, Tex., on ten one-man, double-end, city type, double-truck cars built by the St. Louis Car Company. The cars are of all-steel construction, 39 ft. 11½ in. over all, with a total weight of 35,000 lb. each, and designed to seat 50 passengers. One of the cars was exhibited at the Cleveland convention. General Electric No. 265 motors are part of their equipment. Subjoined are the specifications as sent to the JOURNAL by L. E. Thorne.

Number of units	10
Type of unit	One-man, motor, passenger, city, double, end, double truck
Builder of car body	St. Louis Car Co., St. Louis, Mo.
Date of order	April 25, 1927
Date of delivery	Aug. 31, 1927
Weight, total	35,000 lb.
Length over all	39 ft. 11½ in.
Length over body posts	26 ft. 5½ in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	11 ft. 0 in.
Body	All stee
Roof	Arch



Interior view of one of the units built for the Northern Texas Traction Company

Air brakes	Safety Car Devices Company
Armature bearings	Plain
Axles	A.E.R.A. standard, 4-in. diameter 3/14x6 journal
Car signal system	Faraday
Compressors	Westinghouse DH-16
Conduit	Cables in canvas hose
Control	K-75A controller, No. 98A cutout switch
Curtain fixtures	National Lock Washer Co.
Curtain material	Pantasote, double faced
Destination signs	Hunter Illuminated
Door mechanism	National Pneumatic Co.
Doors	End, folding
Energy-saving device	Economy meters
Fare boxes	Johnson Pneumatic
Finish	Enamel Ripolin
Floor covering	Linoleum, green cork
Gears and pinions	G. E.
Glass	Non-shatterable
Hand brakes	St. Louis Car Co. No. 10558
Hand straps	Sanitary hand holts
Heaters	Consolidated type R.
Headlights	E.S.S. Co., S.M. 95
Headlining	Haskelite 1/16 in.
Interior trim	Mahogany finish
Journal boxes	Symington
Lamp fixtures	E.S.S. Co., dome type
Motors	Four G E-265, inside hung
Registers	International, type R.
Roof material	Treated canvas
Sash fixtures	O. M. Edwards, bronze nickel plated
Seats	Heywood-Wakefield, No. 327-M.S.
Seating material	Cleveland Tanning Co., Hyline train
Slack adjusters	Westinghouse
Steps	Folding
Step treads	Feralun, type A
Trolley catchers	Keystone No. 23154
Trolley base	O. B., form 4
Trolley wheels	Miller trolley shoes
Trucks	St. Louis Car Co., form E-IB-64
Wheels	26-in. rolled steel
Wheelguards	H. B. life guards

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METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Oct. 25, 1927
Copper, electrolytic, cents per lb.	12.937
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.25
Zinc, cents per lb.	5.90
Tin, Straits, cents per lb.	58.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	1.80
Pittsburgh mine run, Pittsburgh, net tons.	1.825
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.25
Kansas screenings, Kansas City, net tons.	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.2
White lead in oil (100-lb. keg), N.Y., cents per lb.	13.75
Turpentine (bbl. lots), N.Y., cents per gal.	$0.52

sales have been made in reasonable volume at the association price of 13.60 cents, c.i.f., and at 13.35 cents, f.a.s.

A moderate business in zinc was done during the week, but at gradually declining prices. The market is established for the time being at 5.90 cents. Producers of high grade zinc quote 7.75 cents, New York, as against 8 cents, which they have held for several months. However, the price is purely nominal as the market is dead.

The continued weakening in the London lead market, which culminated Oct. 25 in a spot quotation of only £20 2s. 6d., put a quietus on buying in the United States, consumers evidently thinking a reduction in prices was in order. Middle Western producers did go back to 6 cents, St. Louis, but the American Smelting & Refining Company continued its contract price in New York at 6¼ cents. On Oct. 26 some encouragement was felt in the advance reported from London, and from the good foreign demand that the lower prices of the week have developed.

A fair demand for tin for prompt shipment to consumers manifested itself during the week, but in general the market has been rather quiet at prices varying between 58 and 59 cents per pound for prompt Straits. Futures have been approximately half a cent lower.

ROLLING STOCK

NEW YORK STATE RAILWAYS, Rochester, N. Y., has ordered three White buses, Model 50-B, with 25-passenger bodies.

SHAMOKIN & TREVORTON BUS LINE COMPANY, a subsidiary of the Shamokin & Edgewood Electric Railway, Shamokin, Pa., has accepted delivery on a 25-passenger Mack city type bus, 196-in. wheelbase, with four-cylinder motors. This bus, it is reported, will replace railway equipment between Shamokin and Paxinos, a 4-mile route.

SAN DIEGO ELECTRIC RAILWAY, San Diego, Cal., announces the purchase of additional equipment to take care of the ever-increasing traffic on the existing bus routes and also for new extensions recently added, including the bus service between San Diego-La Mesa and El Cajon, which added approximately 16 miles of bus route to the system. One A.C.F. six-cylinder, 31-passenger bus was purchased a few weeks ago and orders have recently been placed for an additional Fageol 31-passenger bus and also one of the new Twin-Coaches developed by Frank R. Fageol. These late acquisitions bring the total bus fleet operated on regular schedules to 21.

TWIN CITY MOTOR BUS COMPANY, subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., is standardizing its buses with one-body models on Mack and White chassis. Between fifteen and twenty old buses will be replaced within a year, it is reported.

TRACK AND LINE

TRI-CITY RAILWAY, Davenport, Iowa, is engaged in track reconstruction work on Rockingham Road between Howell Street and Lincoln Avenue. The cost will be approximately $12,500.

TRENTON & MERCER COUNTY TRACTION CORPORATION, Trenton, N. J., will extend its tracks about 2,000 ft. from Stuyvesant Avenue to the Hilltonia section.

WHEELING TRACTION COMPANY, Wheeling, W. Va., has commenced work on replacing the northbound tracks along Warwood Avenue between North Sixth and North Eleventh Streets.

SAN DIEGO ELECTRIC RAILWAY, San Diego, Cal., was recently reported as completing reconstruction of double track on Kettner Boulevard between Broadway and Market Street and north track on Market between Kettner and Atlantic Streets, comprising some 3,300 ft. of equivalent single track. This line was constructed in 1901 and serves the ferry service between San Diego and Coronado, and although 26 years old is reported to be still in excellent condition, not having handled very short headways. The new track is being built with the steel tie-concrete ballast type of construction, the standard adopted by this company for trackage in paved city streets, and is estimated to cost approximately $50,000.

TRADE NOTES

C. J. MARTIN joined the forces of the National Pneumatic Company, Chicago, Ill., as mechanical expert in the Western territory, operating out of the Chicago office, effective on Sept. 1.

LONG MANUFACTURING COMPANY, Detroit, Mich., manufacturer of automotive radiators and clutches, has announced through J. L. Dryden the breaking of ground Oct. 1 for the first unit of its new factories, which will be located at Dequindre, corner of Hellick. The new unit will house the clutch division and power house and will be of one-story brick construction, 128 ft. by 402 ft.

R. L. WILSON, works manager of the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company, has been made assistant to vice-president and general manager, and J. M. Hipple, manager of the company's motor engineering department, succeeds Mr. Wilson as works manager, according to a recent announcement by F. A. Merrick, vice-president and general manager.

J. J. HILT has been appointed sales manager of the Young Radiator Company, Racine, Wis. He was formerly connected with the Racine Radiator Company and its predecessor, the Perfex Radiator Company.

TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, and M. B. U. Dewar of London, England, have, together, purchased from Vickers, Ltd., all of the capital stock of British Timken, Ltd. This purchase, it is understood, gives Timken complete control, throughout the world, of the manufacture and sale of Timken bearings. The Birmingham plant of British Timken, Ltd., is being enlarged. Officials of British Timken, Ltd., were reported as being at the Canton, Ohio, works making final arrangements for the immediate establishing of factories in France and Germany.

AMERICAN ENGINEERING COMPANY, Philadelphia, announces the appointment of R. H. McGredy as Philadelphia sales manager of the Lo-Hed Hoist Division of the company.

ADVERTISING LITERATURE

OHIO BRASS COMPANY, Mansfield, Ohio, is mailing a folder which presents the features of the O-B trolley wheels and harps.

PYROMETER INSTRUMENT COMPANY, New York City, has recently issued a bulletin, No. 20, describing the construction and operation of "Pyro" radiation pyrometers.

CONDIT ELECTRICAL MANUFACTURING CORPORATION, Boston, Mass., has issued a folder announcing the Condit type E-20, with thermal control.

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., is distributing a fifteen-page pamphlet for looseleaf binding, entitled GEA-763, descriptive of induction motor panels, isolated type 220, 440, 550 and 2,200 volts, 25 to 60 cycles, three-phase, non-grounded, three-wire for motor with wound or squirrel cage motors. It is also distributing in the same form literature dealing with station oil circuit breakers, type FK, FKO, FHK and FHKO-236; station oil circuit breakers, type FK-230 and FHK-230.

W. E. CALDWELL COMPANY, Louisville, Ky., has recently distributed the 38th annual edition of its tank and boiler catalog. A complete line of tanks and towers is presented, with adequate explanatory notes.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, November 5, 1927 *Number 19*

Putting Accident Responsibility Where It Belongs

MOST accidents are due to carelessness. This is particularly true of grade crossing accidents. Too many people have taken the position that it is the railway's duty to protect the crossing, and not their own duty to be careful. This attitude of negligence has now been rudely upset by a decision of the United States Supreme Court putting the responsibility for his own safety squarely on the shoulders of the driver of the vehicle.

"When a man goes upon a railroad track," the decision says, "he knows that he goes to a place where he will be killed if a train comes upon him before he is clear of the track. He knows that he must stop for the train, not the train for him. In such circumstances, it seems to us that if a driver cannot be sure otherwise whether a train is dangerously near, he must stop and get out of his vehicle, although obviously he will not often be required to do more than to stop and look. It seems to us that if he relies upon not hearing the train or any signal and takes no further precaution, he does so at his own risk."

Thus the Supreme Court set aside a judgment against the Baltimore & Ohio Railroad allowed by a lower court in favor of the estate of a man who was killed in a grade crossing accident. The logic applies with equal force to grade crossings of electric railways. While the full import of the decision cannot be known until the entire text is available, it would seem to put greater responsibility upon the automobile owner at grade crossings than in the past. This is a step in the right direction.

Needless to say, the railways will continue to take every reasonable precaution to prevent accidents. Putting the responsibility on the driver after the accident has happened does not save the railway from loss. It will, however, save the added burden of a large indemnity for injury or damage for which the railway was not to blame.

The High Cost of Automobiling

FOR the first time authentic figures have been obtained that show how the average dollar is spent for retail products in an American city. The United States Census Bureau, with the co-operation of the Chamber of Commerce of the United States and the local chambers of commerce, has recently completed a retail census of distribution in eight American cities. The first to be released is that in Syracuse, N. Y. From a transportation standpoint the most remarkable finding is that out of the retail purchase dollar nearly 17 cents goes to automobiling, auto sales absorbing about 10¼ cents, gasoline 3½ cents and accessories 3 cents. Since the total retail sales in the city amount to $103,000,000, the cost of automobiles is some $17,250,000 a year.

Contrast this 17 cents for automobiling with 27 cents out of the retail dollar spent for food, 22 cents for clothing and 7 cents for housefurnishings—things usually looked on as necessities—and it looms even larger. However, it is only when a comparison is made with the amount paid for public transportation that its real significance is seen. Residents of Syracuse spent some $2,355,000 for trolley and bus fares in 1926. Thus the amount spent on automobiles in that city last year was 7.3 times as great as all the money spent for public transportation!

It may be argued that a considerable part of the automobile total was spent for capital account, being for purchases of cars. However, it is an expenditure that is going on year after year, and now has become to a large extent a replacement charge. It also may be said, on the other hand, that the trolley and bus fares include a certain amount for depreciation and replacement of the plant.

There is a silver lining in the cloud, in that the number of passengers carried by the public transportation system in Syracuse increased last year despite this staggering expenditure for a competitor. This indicates that the public has an appreciation of the value of the railway company's service and is making use of it. Furthermore, it is an indication that when the public carrier supplies the kind of service demanded by the public its demise is a long way off, at least in this typical American city.

If the Public Could Be Made to Understand

FUNDAMENTAL principles of business are so unerringly laid down in the decision of the Massachusetts regulatory body in the Holyoke fare case that it is too bad the findings in full will go largely unread even by the very people who patronize the Holyoke system. It is a typical case, typical in that the city, one of 60,000 people, is of the size in which the railways have been hardest hit, typical in that the management has been progressive and alert and typical in that, despite all that has been done, 3,000,000 fewer riders were carried in 1926 than in 1920.

There have been cases of exploitation in the electric railway field, but no stigma attaches to the conduct of the Holyoke property. The company put off its appeal to the state until the last minute. It sought only what was just and reasonable and the commission insists that it shall be allowed what is just and reasonable. That the commission deemed it expedient to modify slightly the tariff filed by the company does not change the fundamentals involved. Massachusetts utility companies, judiciously regulated by the state from their very inception, are obliged to sell their stock at par or at a premium, if they are to sell it at all.

In the past many of the companies serving the public, the electric railways included, have sold stock at a handsome premium. Among them was the Holyoke company,

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now seeking to preserve itself in the face of changed economic and industrial conditions. It is true the company paid dividends in 1926, but it actually earned only 4.17 per cent on its stock and premium.

The nub of the situation seems to lie in the fact that had there been no falling off in the number of passengers carried in 1927 as contrasted with 1920 the company would have received additional revenue under the existing fare equivalent to the proposed increase. The rates authorized will, it is thought, preserve the *status quo*. The commission, in its decision, reiterated that any policy which results in failure to maintain the value of the stock of the company at par cripples its ability to meet the needs of the community, impairs its credit and, if long continued, results in financial disaster to the company and great inconvenience to the public.

There is nothing new in this as a commission attitude. Neither is there anything new in the statement of the commission that adequate service cannot be given unless the passengers pay rates sufficient to provide adequate service. They are merely axioms oft overlooked. It is the constant reiteration of these things that helps, particularly their reiteration in the clear, forceful way of the Massachusetts commission in passing upon the issues involved in the Holyoke application.

Getting More Recruits for the Industry's Work

NEED for a continuing supply of skilled labor to carry on the work of American industry has been felt ever since there has been the tremendous increase in output demanded by the present markets. Concern on this score is reflected in a bulletin recently issued by the Department of Manufactures of the Chamber of Commerce of the United States. It cites specifically a recent banquet given to more than 500 veterans in one concern with service records of 25 to 50 years. "How are they, with their skill and experience, to be replaced?" is the pertinent question asked.

Unfortunately, trained immigrants or the draft of skilled labor from neighboring plants is out of the question. Those who still contend that skilled labor can be hired when needed would only rob Peter to pay Paul. This policy can have but one outcome—lack of supply as the demand for labor increases more and more and the present skilled workers retire or die off. Someone must do the training. The answer is to induct into trades and shops American boys and make them see the industrial opportunities, meanwhile turning their eyes from the white collar jobs. That this can be done successfully is proved by results in a number of companies where attractive training has been developed.

Experience in the electric railway industry, no less than in others, indicates that there is opportunity for the trained worker, no matter in what line he is employed. Many prominent executives have passed through the school and have found it a direct route to executive positions.

Nothing should be done, however, to prevent the entry into the industry of the young man who has had the opportunity for the more intensive training offered by the colleges and technical schools. If such men can be induced to enter the ranks of skilled labor they can have an influence on methods far beyond anything yet accomplished. They are the men who, if ready to seek the romance and reward found in the industrial fabric of the country, may find their way to the front easier than had they held back for the positions that from the outset carry more authority and less bodily labor.

There is another field in which the services of such young men can be of great value as they become proficient workmen. This is in the training of other young men who have not been so fortunate in their educational advantages. This training can then be made more intensive and more interesting than when outsiders plan and administer it. Those who are able to do the teaching will have a reward not only in the chance for their own more rapid advancement but in the better understanding of their work which will come naturally as a result of their labors in transmitting it to others.

The Menace of Government Operation and Federal Regulation

NO QUESTION to come before Congress at the impending session is likely to be of greater significance to the public utility industry than that of electric power. The issue may not take just this form, but it gives prospects of resolving itself into the answer to the interrogations: Shall the federal government decide to allow the unrestricted development of superpower organizations, or will Congress further tighten the present restrictions? Shall the government decide to go into the business of producing and selling electricity?

Proponents of government operation and federal regulation are prepared to seize upon the growth and magnitude of interconnection and the growth and prosperity of operating and holding companies to increase the inherent human fear of things that are big. That, however, is not all. Political adventurers may be counted on to distort the situation to their purposes by broad claims based on the citation of isolated instances which as a matter of fact are in nowise either typical or symptomatic. Facts will be sought by them in isolated situations where either exceptionally efficient municipal operations or exceptionally inefficient private operations provide the arguments they want.

It is, of course, true that the utilities are not entirely free from acts of remission. In the interest of truth, however, it has become highly important to the utility industry that a clear contrast be drawn in the public mind between these few apparent black spots and the record of honest, intelligent and efficient public service that has characterized the development of the great power systems of the country. To protect the public and defend the principles that underlie this splended development, accomplished only under the operation of highly specialized private management, the true picture must be made plain, based not on ingeniously selected isolated cases, but on the broad resources of facts that are typical and true of the industry as a whole.

As *Electrical World* pointed out in its issue of Oct. 29, no matter what one may think Congress is or is not going to do, the issue is important. If not, then George B. Cortelyou would not now be heading the recently reorganized joint committee of National Utility Associations and be at work preparing to conduct a campaign of public information intended to spread much light and expected to do much good. This effort is foredoomed to only a fragment of the achievement that might be possible unless the million and more men and women of the electrical industry are alive to the situation and daily exercise their personal influence in behalf of the industry of which they are a part. Theirs is the obligation to see that the shadow is not mistaken for the form.

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Railways Develop a Soul

WITH the passing of the years there has been a great change in the attitude of the railway toward its public and, what is of equal moment, with its employees. True, the cartoonists still like to draw pictures of the bloated traction magnates with well-filled paunches covered with clothes bearing the old familiar dollar mark patterns. Some labor leaders still like to portray the two-fisted, hard-boiled boss and the downtrodden workingman. But with all this the public and the employee are seeing the manager in an entirely different rôle from that of yesterday. As an illustration of the change in attitude, who in the old days could imagine a thousand employees gathering together to rejoice over the successful culmination of a customer-ownership stock-selling campaign which they had conducted, and then remain to congratulate the president of the company on his birthday anniversary? Or who could conceive of the many 20-year or 25-year clubs that hold meetings where the veterans of the service rub elbows with the management and talk of the past and the future?

Other evidences of the trend of the times are the men-and-management control of several leading properties. Here the employees and the officials, working in a common cause, meet and discuss the problems of the company, formulating plans to foster mutual understanding and to promote the welfare of the men and the profits of the stockholders. It is also significant that in such companies many if not all of the employees are enrolled in the latter classification.

If the management is not willing to adopt a human attitude because it is the right thing to do, still it may find a reason in that it brings the right kind of financial results. Almost without exception those companies which are the most prosperous are the ones where the employees and the public have been taken into the confidence of the management. When they have been in trouble all parties have got together and found a way out that has given the public an improved service and made the employer a better one for which to work. Surely this is a result well worth the effort.

Insurance Regulations for Motor Vehicles Need to Be Unified

ONE of the outstanding difficulties to be overcome in stabilizing liability insurance of motor vehicle common carriers is the simplification, clarification and uniformity of insurance regulations, according to Henry Swift Ives, whose address on insurance problems, delivered at the recent Utilities Commissioners convention at Dallas, is abstracted in this issue. He rightly calls the present situation "a mess."

Many laws have been enacted by state legislatures and many rulings made by state utilities commissions. Most of these depart from standard insurance practices and even from other legislation governing the insurance business, according to Mr. Ives. Legislative or commission requirements conflicting with standard practices include: (1) Duplicate coverage of bus operators with both the liability policy and the workmen's compensation act, effective in most states; (2) necessity in some states for separate policies for bus passengers and others for which the operator may be liable; (3) allowing damage suits to be brought against insurance companies direct, making insurance rates higher since claimants sue for larger amounts; (4) ambiguous statutes and commission rulings prescribing the limits for which policies must be written; (5) lack of bus insurance laws prescribing the wording of policies or indorsements, and (6) requiring that the insurance policy cover not only the vehicles specifically enumerated but "any other" vehicles employed in the service. Other similar laws and rulings which serve no particular public interest add materially to the cost of insurance.

Little or no consideration has been given by any state to other states in adopting regulations. The lack of uniformity is vexatious to insurance companies and costly to bus operators, especially those doing an interstate business whose operating status has not yet been definitely settled. Obviously the remedy for the whole situation lies in the co-operation of all parties interested—the stock insurance companies, the utilities commissioners and the bus and truck operators—in order to secure the legislation and commission rulings necessary to obtain uniformity.

Encouraging Statistics on Safety Zones and Traffic Lights

OUT of a recent meeting of the administrative board of the American Engineering Council held at York, Pa., come interesting and encouraging signs in the matter of street car safety zones in city streets. Also accident reductions are shown as a result of the installation of electric signal traffic control in many cities.

It is revealed that street car safety zones are desirable on wide streets, according to returns from 81 cities reporting on the subject. Also, that these zones marked on the pavement but without other protection are considered worth while in only 24 of the cities, and that 58 cities indicated that the zones are desirable only if protected by pedestals and lights. Safety islands at cross walks are deemed effective in 48 of the cities for use in wide streets unguarded by signal lights.

Investigation of the feasibility and protective features of the electric signal traffic control reveal 71 cities reporting, of which 54 have reduced the number of accidents. Altoona, Fort Worth and Oklahoma City show a reduction of 100 per cent. Several cities report reductions ranging from 40 to 80 per cent. In 62 cities vehicle collisions have been diminished. In the month prior to the installation of the signals in Altoona there were 37 accidents. There have been none in the four succeeding months. In connection with these figures it should be remembered, however, that the installation of synchronized lights usually slows down traffic movement. Many automobile drivers then use streets not so controlled and the reduction of accidents in one locality is balanced by an increase elsewhere. Experience shows that regulation is effective only when it is properly designed to meet the needs of the situation.

The industry may well take pride in these results, as it has in no small way contributed to elimination of accidents by the installation of street safety zones and the participation of its engineers in matters pertaining to effective electric signal traffic control. The electric railways have not neglected this phase of public relations. With traffic congestion increasing hourly the problem of protecting pedestrians from injury and the owners of vehicles from property loss and of securing expeditious movement of traffic must be shared with the civic authorities.

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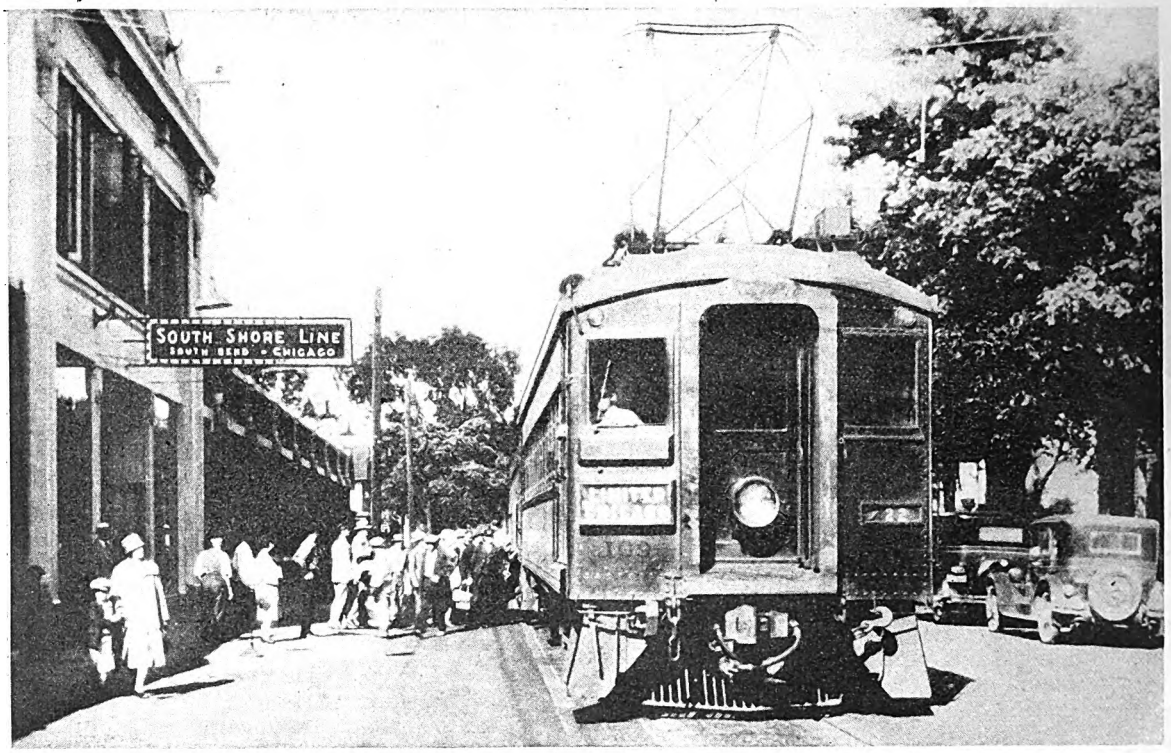

Passengers boarding a limited train for Chicago

Rehabilitation Brings Results

on the South Shore Line

Within two years this property has been supplied with 1,500-volt equipment instead of alternating current, has been rehabilitated in many other ways and has almost doubled its gross revenue

IN THESE days when private automobile competition is keen, it is a satisfaction to record the experiences of those interurban electric railways which have developed good business in spite of it. Several striking examples of this kind have been given in these pages. Another is the Chicago, South Shore & South Bend Railroad, which in a little less than two years has almost doubled its gross revenue. In the first six months of 1927 the gross revenue was more than 100 per cent greater than for the corresponding period of 1926.

The following figures tell at a glance the progress that has been made in two years:

Year	Passenger Revenue	Freight Revenue
1925	$599,236	$189,236
1926	750,539	249,138
Twelve months ended July 15, 1927.....	1,217,116	330,489

Details of the steps through which this remarkable result was accomplished are given in the company's brief for the 1927 Coffin Prize. References also have been made naturally to this notable change in current issues of the ELECTRIC RAILWAY JOURNAL, but particularly on pages 218-220 of the issue for Aug. 6, 1927. The facts herewith are taken from the brief mentioned, so to a slight extent cover material printed more briefly in the Aug. 6 issue. The facts are given, however, from a different viewpoint.

A little more than two years ago the physical property and equipment were in a badly rundown condition. The company's operating revenues, passenger and freight, had shown a steady decrease year by year. It was not in a position to give the public the character of service necessary to meet competition, particularly from the private automobile. The present management acquired the property in July, 1925, and immediately undertook an extensive rehabilitation program. Speed and comfort in travel were considered essential if old business was to be held and new business procured. Neither of these essential requirements was possible under the conditions which prevailed at the time the property was acquired. The new management had faith in the future of the territory served by the railroad. Investors had faith in the new management.

The South Shore Line is a subsidiary of the Midland

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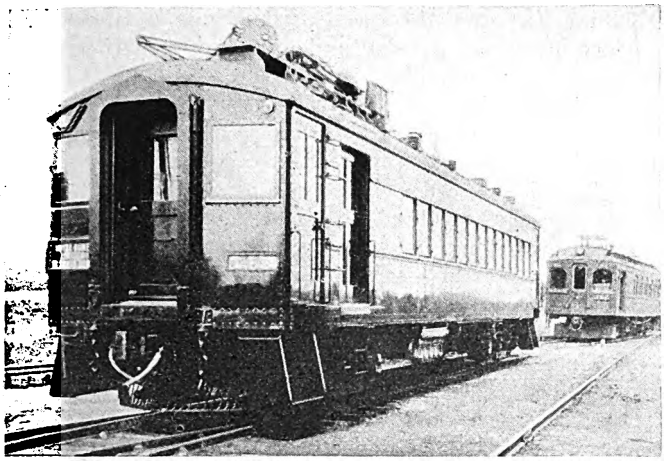
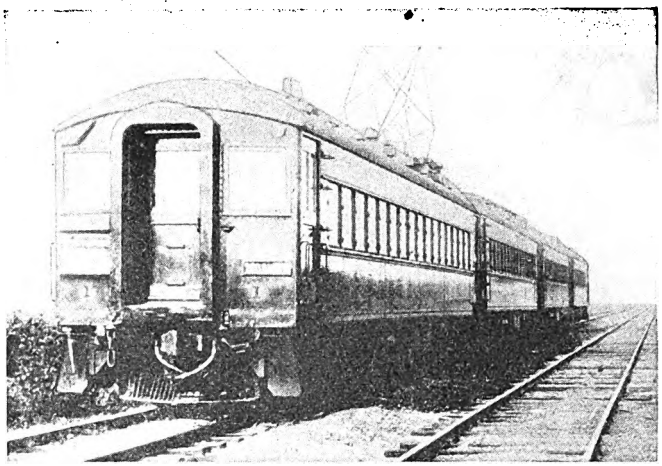
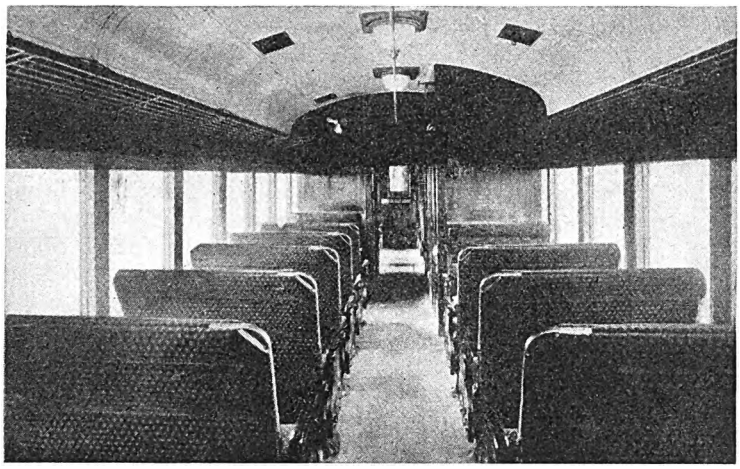


South Shore Line steel passenger car, with baggage compartment, showing vestibule diaphragm and other details. In the background is one of the old-type passenger cars



A four-car South Shore Line passenger train on the "Ideal Section." This stretch of track has the latest type steel bridges for supporting the overhead catenary construction



Interior view of South Shore Line passenger car, showing roomy seating arrangement and wide aisle

Utilities Company, a holding company having investment in a number of public utilities in the territory. The Midland loaned its credit to the South Shore Line, enabling it to borrow new capital to rebuild and change over from a.c. to 1,500 d.c. and obtain new, up-to-date steel equipment. Without this credit the railroad could not have been rehabilitated and made a useful servant of the public.

New equipment equal to the best for electric railway service was ordered to assure the comfort of the traveling public. The roadbed was rebuilt to permit of high speed with safety, new stations were built and old ones remodeled. Schedules were speeded up, the public was kept fully informed of the improvements being made through extensive publicity and advertising and traffic solicitation was actively pushed. Results are shown in the revenue figures quoted on page 852.

The results achieved by the South Shore Line have been accomplished in the face of the keenest competition. No fewer than nine class "A" steam railroads operate in the territory, competing with the interurban for passenger business in one or more of the cities served, while an even greater number of belt and industrial railroads compete for freight.

In addition to steam railroad competition for a great part of its length the South Shore Line is paralleled by one of the finest paved highways in the country, providing ideal facilities for motor coaches and private automobiles. This highway is the main entrance into Chicago from Eastern states and it runs through the famed vacation resorts in northern Indiana and southern and western Michigan. A number of motor coach routes operate over this highway in direct competition with the railroad, so that it is only by giving the public a much faster and an equally comfortable service that the railroad has been able to build up the passenger business it now holds.

Realizing the importance of the motor coach in the transportation field and its popularity with a large portion of the public, the management of the South Shore Line on assuming control took steps in connection with its rehabilitation program to establish extensive motor coach service and so far as possible make it an auxiliary to the railroad.

With that end in view a separate corporation known as the Shore Line Motor Coach Company was organized. The motor coach company is owned jointly by the South Shore and the Gary Railways, a street railway serving the city of Gary, Ind., and connecting it with a number of cities in the territory. Like the South Shore Line, it is a subsidiary of the Midland Utilities Company.

This joint ownership of the motor coach line by the electric railways made possible a co-ordination of its service with both companies, greatly to the advantage of the traveling public through the issuance of tickets good on either rail or motor coach lines and the arranging of schedules to provide easy transfer facilities.

Buses Assist in Business Building

The main reason for organizing the motor coach company as a separate and distinct corporation was the belief that men charged with responsibility for its operation would take greater interest in developing its business than would be the case if the same officials operated both motor coach and railroad lines.

The motor coach lines have assisted the railroad materially in building up its passenger business because of the co-ordinated service. The motor coaches cover a wide stretch of territory far removed from the rail lines. Passengers traveling from Chicago to Michigan vacation resorts save time and avoid congestion by taking the rail

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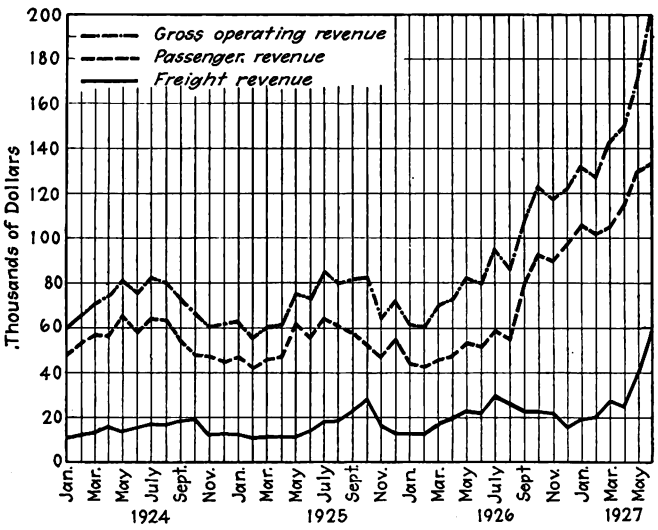
line to Michigan City, Ind., and there transferring to a motor coach.

Coach tickets are sold with an optional privilege of riding either on the South Shore Line trains between Michigan City and Chicago or on the coaches. The attention of passengers is called to the fact that an hour or more can be saved by them if they ride on the train.

If any prefer the motor coach all the way, regardless of the longer time required to travel through the Chicago congested area, it is there for their convenience and choice. The transfer business between motor coach and



Gross Operating Revenue, Passenger Revenue and Freight Revenue Since 1924

It is interesting to note the marked climb in gross operating revenue following the inauguration of new hourly service and the installation of the new passenger equipment late in August, 1926, as well as the continual increase in the following months. Up to the early part of this year this rise was due almost entirely to increased passenger earnings. Within the last few months the freight revenue has experienced a heavy increase, although it has had a steady climb since the railroad came under the present management.

railroad in both directions at Michigan City is steadily increasing, indicating that the public prefers the faster rail line in the congested area.

Direct Entrance to Downtown Chicago

Another factor which has contributed largely to the increase in passenger revenue of the South Shore Line is its direct entrance into the heart of Chicago under electric power. This was made possible by the recent electrification of the suburban tracks of the Illinois Central Railroad and the working out of an agreement with that company.

Under the conditions which formerly prevailed, trains of the South Shore Line entering and leaving Chicago were pulled by a steam locomotive between downtown and Kensington, in the southern section of the city, a distance of 16 miles. Changing from electric to steam power necessitated delays and the speed of the steam locomotive was much slower than that of the electric motor.

This change from steam to electric power within the city of Chicago resulted in eliminating the delays at Kensington and running schedules were reduced by twelve minutes for the 16 miles. The reduction in time alone greatly increased the popularity of South Shore Line service.

Having increased the speed of its trains and provided comfort by means of new and greatly improved equipment, one thing remained to complete the popularity of South Shore Line service. That was to increase the convenience to the public by more frequent service. As soon as it was in a position to do so the management put through trains between Chicago and South Bend, Ind. (a distance of 90 miles), on an hourly schedule instead of every two hours and installed a half-hourly service between downtown Chicago and Gary, Ind. (a distance of 31 miles).

The number of trains operating in and out of downtown Chicago was increased from 25 to 72 daily. The long-distance rider was separated from the short-distance commuter. Each class was given a distinct service for itself, so frequent and convenient that the traveler had no reason to seek other means of transportation. That the public appreciated the efforts to please is shown by the greatly increased business.

In developing its passenger business by every means at its command the company did not overlook the possibilities of freight development. Track connections were made with nine steam railroads and an interchange of freight cars effected. Through rates were established with steam railroads between the East and Chicago and to points west, the South Shore Line serving as an intermediate carrier.

Interchange Saves Shippers' Time

By use of this interchange system shippers found that at least 24 hours in the time of delivery could be saved. Freight cars on the electric railroad could be run at a much higher rate of speed and the congestion in the steam railroad classification yards avoided.

For less than carload freight the company installed an overnight service which proved popular with shippers. Receiving stations were established in the heavy shipping districts of Chicago. Freight delivered at any of these stations in the afternoon is hauled by trucks and trailers to the railroad and delivered to any point on the line ready for the consignee to pick up the following morning. Further particulars of this freight service will be given later.

Operates in Diversified Region

In considering the various factors which have contributed toward the marked success with which the South Shore Line has met in the last year the territory served should not be overlooked.

The railroad operates between Chicago and South Bend, Ind., a distance of 90 miles in a south and east direction. It serves the great industrial center in the Calumet River region, known as the "Workshop of America," with its immense steel mills in East Chicago and Gary, its great cement plants and other factories which give employment to tens of thousands of workers.

Emerging from this beehive of industry the railroad skirts the shore of Lake Michigan from Gary to Michigan City, passing through the famous Indiana Dunes, a region that is unique. It is a natural playground possessing the distinctive features which have made this region a mecca for outdoor enthusiasts. From April to October there is an endless succession of wild flowers.

On-Time Service

It was recognized that in the past trains not on time had been a factor in discouraging use of the railroad. As a result a strenuous effort has been made to keep

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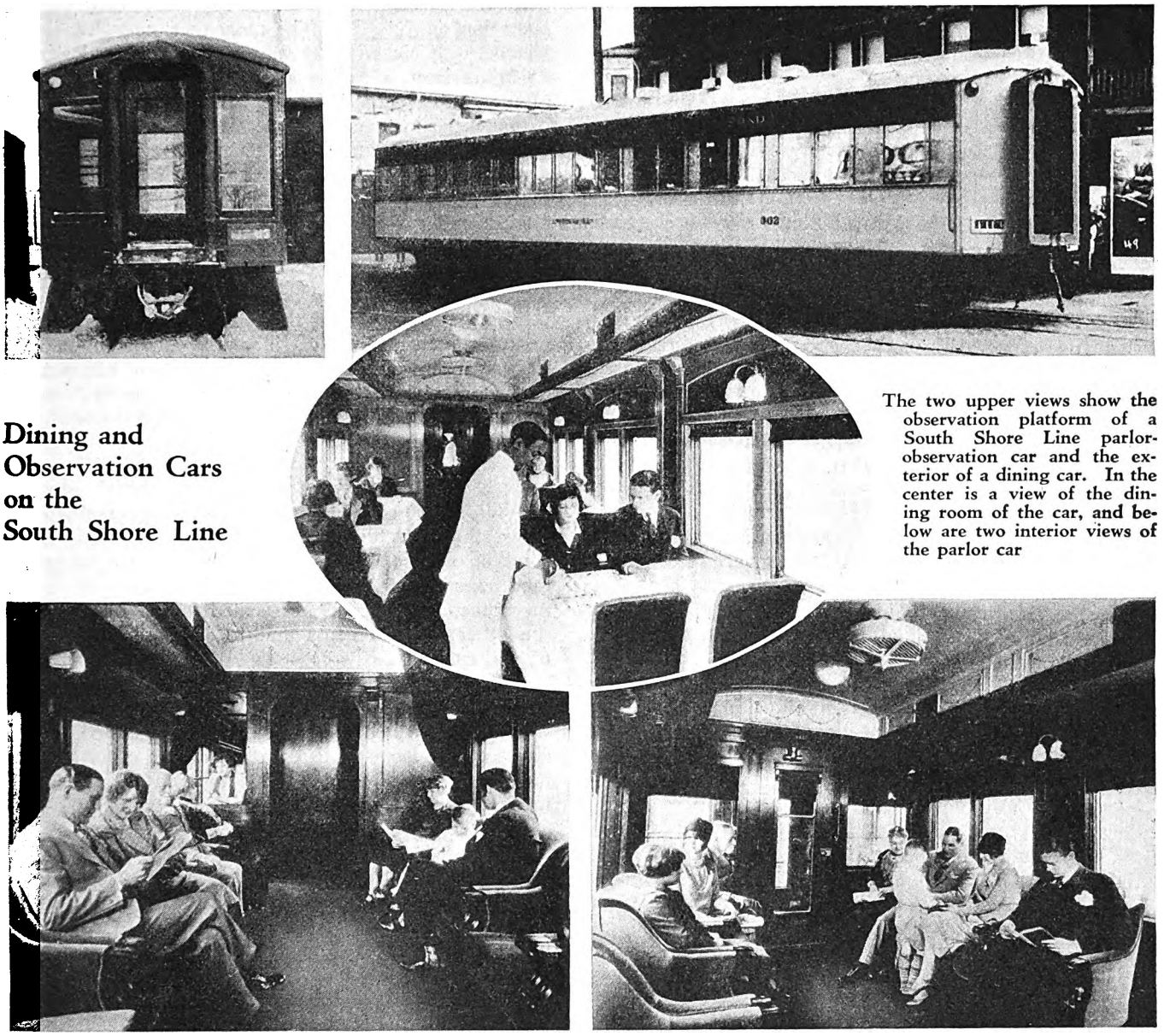

Dining and Observation Cars on the South Shore Line

The two upper views show the observation platform of a South Shore Line parlor-observation car and the exterior of a dining car. In the center is a view of the dining room of the car, and below are two interior views of the parlor car

trains on time. At the time the line was taken over late trains averaged 25 per cent of the total number. This percentage was reduced to three, during April, 1927. Due to the fact that the line is operated over single track for more than 50 miles, with 7 miles over city streets and a great number of railroad crossings in the industrial territory on its west end, this on-time record is more impressive.

New Passenger Cars Purchased

Another of the significant factors in the building of greater patronage was the installation of new passenger equipment. Twenty-five new steel cars were placed in service late in August, 1926. The cars were designed in the railroad's equipment engineering department and are most modern in every detail. They are equipped with four 210-hp. motors and are capable of attaining a speed of 67 m.p.h. They are built for multiple-unit control and their cost was $1,000,500.

A feature of their design is the separation of the smoking compartment from the balance of the car through an arrangement similar to that in steam railroad Pullmans. This eliminates the passing of passengers through the smoking compartment in boarding or leaving the car and has proved popular.

So rapid was the resulting growth of business that twenty additional passenger cars were ordered six months after the first cars were received. They are of the same general design, ten being motor cars and ten trailers. All of the seats in the twenty new cars are of the reversible "bucket" type, a departure in equipment of this sort.

Two new steel dining and two parlor-observation cars were purchased and placed in service early in 1927. They are operated on twelve trains daily between Chicago and South Bend and are considered the finest of their kind ever placed in service on an electrically operated railroad. Their total cost was approximately $180,000.

Dining and Parlor Car Service

The dining cars provide serving accommodations for 24 persons. Their interior is finished in light shades of lacquer, with carpeted floors, handsome tables and chairs and fine linens, china and silverware. The kitchens were built on an extra large scale, making possible fast service. This was done in order that short-haul passengers between Chicago and the nearby towns of Gary, East

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Chicago and Hammond might finish their meals between cities, or within 37 minutes.

The parlor-observation cars seat 21 persons in individual easy chairs. They also have a smoking compartment for men and a handsomely appointed ladies' lounge. A buffet kitchen, in which light lunches may be prepared, is included. Glass-inclosed observation platforms are at either end of the cars, making unnecessary turning them at the end of the line.

Both dining and parlor cars have six-wheel trucks, a departure in electrically operated railroad equipment which greatly increases ease in riding. They are slightly longer than the regular passenger equipment.

The exteriors of all cars are finished in a distinctive shade of orange, with maroon letterboards and trimming. This color makes South Shore Line cars easily distinguishable from other railroad equipment using the Illinois Central Terminal and also tends toward greater visibility. All car equipment is of standard steam railroad width, and the passenger cars are 60 ft. in length.

"Crack" Trains Named

In an attempt at greater popularization of the dining and parlor car trains they have been given names having a close association with the district served.

The trains leaving Chicago are known as: Notre Dame Limited, Duneland Limited, Industrial Limited, Indiana Limited, Marquette Limited and St. Joe Valley Limited.

Leaving South Bend are the following: Fort Dearborn Limited, Grant Park Limited, Illinois Limited, the Boulevardier, Randolph Limited and Garden City Limited. A train known as the Chicago Theater Special leaves Gary in the evening at a time convenient for residents traveling to Chicago playhouses.

"Every hour on the hour" and "Every halt hour on the hour and half hour" are the easily remembered phrases describing the leaving times of South Shore Line trains from terminals.

Schedules were arranged in this manner with the sole object of greater public convenience.

Co-ordination of Rail and Motor Coach Service

As already explained, a luxurious type of motor coach service was developed in co-ordination with that on the railroad. The main line of the coach company is operated between Chicago and Muskegon, Mich., paralleling the railroad on the Dunes highway as far as Michigan City and thence going north through the popular resort country on the eastern shore of Lake Michigan to Muskegon, 140 miles from Michigan City. Coach schedules are so arranged that there is only a few minutes' wait between the arrival of the train and the departure of the coach, and vice versa. Interchange between the coaches and trains is increasing in popularity as its features become better known to the riding public.

This operation of motor coaches many miles off the line for the purpose of enlarging the scope of territory served by the railroad proved such a valuable attribute of the service that a second line has been established, providing joint rail and coach service between Chicago and Detroit, Mich. Under the new plan Detroit passengers may board a dining car train in Chicago and, after luncheon, board a non-stop coach for Detroit at South Bend. The line is known as the "Golden Arrow." Coaches of the newest type, fitted with toilets and washrooms, permitting the elimination of rest stops, have been delivered for the run. They were scheduled to begin operation on July 22. The passengers may leave either Detroit or Chicago at noon and be at their destination 8½ hours later, a saving over other motor coach routes of more than three hours in running time.

One other instance of successful co-ordination between the Shore Line and the South Shore Line has been demonstrated at Hammond, Ind. The railroad's station at that place is about 1 mile from the business district and a somewhat greater distance from the residential area.

During the past year coach service was inaugurated between the station and the above-mentioned residential neighborhood, operating through the center of the business section of the city. The line almost immediately showed a return and traffic on the railroad has increased materially due to the convenience of the motor coach service, which was arranged to meet all incoming and outgoing trains.

Cheerful, Courteous Trainmen

While millions of dollars were being expended to improve the railroad's service, the value of the human equation was not lost sight of by the management. It may be said that trainmen and other employees coming in contact with the public seemed to fall into step with the other improvements and to increase their attitude of politeness.

Others who could not adapt themselves so readily were taught the tenets of modern railroad service. Meetings were held at which operating officials explained the principles of service as well as differences in other operating methods. Patrons were quick to note the change and many letters of commendation have resulted.

Other Incentives for Business

Passenger cars are kept clean, both inside and out. Regularly scheduled washings take place at terminals and in the company's shops. The upper third of the seat backs are covered with linen cases, giving the car interior a clean appearance.

A plan for baggage checking on trains was placed in effect with the operation of the new equipment, several units of which were built with baggage compartments. Arrangements were made with transfer companies in the terminal cities in order that through passengers might be relieved of the trouble of rechecking their baggage either to other railroad stations or to their homes.

Approximately 500 agents of the Chicago Rapid Transit Company, who are constantly in touch with a great portion of the Chicago public, and between 40 and 50 agents of the Illinois Central Railroad suburban service were taken on inspection trips of a day's duration on the railroad and motor coach line early this year. This was done in order that they might become acquainted with the service and be in a position to give first-hand information, if called upon, and in this way aid in selling it to the public.

In a later article an account will be published of the betterments made in the freight service, which proportionately have been as great as in the passenger service, and of the engineering improvements made on the property other than those in the cars and change to direct current already mentioned. An indication will also be given of the changed financial status of the company which has resulted from the present policy of better service.

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Interchange of Ideas Aids the Industry

By R. P. Stevens
President American Electric Railway Association

A feature of the first fall meeting of the New England Street Railway Club was an address by the president of the American Electric Railway Association, pointing out the trends in local transportation as indicated in the briefs submitted in the 1927 Charles A. Coffin competition.—EDITOR.

EUROPEAN observers have declared that one of the potent reasons for American industrial supremacy is the readiness of industrial leaders, even though competitors, to exchange ideas and experiences and to discuss problems in common. Of no other industry is this so true as of the electric railway industry. The accomplishment or experience of one operator is ever at the command of others. For guidance one cannot do better than turn to the briefs submitted to the American Electric Railway Association in the recent Charles A. Coffin Prize contest. True, the contestants for the Coffin Award were only a few of the many successful operators of the country, yet the presentations of these twelve show such a common trend that a composite picture of their activities and accomplishments is representative of the best in the industry as a whole.

The purpose of every transport organization is to supply its communities with a service that will meet the public needs, be so acceptable that the revenues received will pay for that service, and yield a proper return to those whose investments have made the service possible, thus inviting new capital at reasonable cost to meet ever-expanding requirements.

Car Rider Pays for Service

To my mind, electric transportation has suffered from lack of service—lack of *good* service—in a highly competitive field. Our customers are the judges. They choose the means of transportation which appeals to them. They have become accustomed to the advantages and luxuries of the private automobile, which thus has become largely the measure applied to our service. To compete, our service must be high class, ever keeping step with the modern trend toward greater comfort and more luxurious living. We must meet conditions as they exist—not seek to change conditions to fit preconceived ideas of what our customers should have. It is practicable to do this. Some of the contestants for the Coffin award show how it is being done.

With public consciousness awakened to the realization that local mass transportation is essential to community progress many companies have been able to free themselves from a variety of inconsistent tax impositions that prevented them knowing where they stood from one year to the next; saved them from paying for pavement which they do not use and that only makes their track construction more costly; from sprinkling streets; from paying salaries of traffic police, or from similar charges that have come down to us from a dim and distant past. Freedom from such unwarranted burdens permits use of revenue, formerly so diverted, to give service, the thing the car rider is paying for. So, too, does relief from compulsory two-man operation when automatic equipment permits equal or better service with a single operator.

In other cities the way has been opened for improved service and the proper selling of that service by protection from piratical competition, and by allowing the transportation management to use its judgment in the choice between car and bus. In this connection, agreement of the community—as in Norfolk and Richmond—that a quarter mile spacing between routes does not impose any walking hardship should be a valuable help to companies facing demands to extend bus routes in every direction and on every street. Even a bus route requires a certain minimum population to be self-sustaining.

Superior Service Justifies Higher Taxes

In the determination of rates of fare also are found ways leading to improved and more salable service. Grand Rapids and Virginia teach the value of recognition of the right to earn a given rate of return, whether or not under a service-at-cost arrangement, while a number of those companies whose darkest days are behind them have placed in effect, or have applied for, a basic 10-cent fare.

These companies are awake to the true characteristic of the American people—the determination to have the best and the willingness to pay for it. Success in securing higher fares through consent of local bodies was not born of pity for the poor, down-trodden trolley. It was based on the definite idea of raising the standard of service to a level that would justify the higher charge for the ride.

Operating activities of the companies to reach high standards of service are manifold. The trend we find is toward the purchase of power instead of the maintenance of generation plants. This and the use of automatic substations go a long way toward simplifying the organization of interurban railways in particular.

Steel ties and welded rail for paved track; creosoted bridge timbers and ties; automatic track switches, and the like, in widespread use show what the live railway man is doing. When one property reduces way maintenance 14 per cent in four years and another doubles the car-miles to each derailment, we know that the way engineer is developing ideas of his own.

So, too, in the shops. Individual motor drive and specialized tools bought from responsible manufacturers

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have replaced obsolete shafting and awkward home-made contrivances with a notable saving in man-power and improvement in results, while companies have spent liberally for modern rest rooms and wash rooms on the sound principle that better surroundings lead to better work.

It is heartening to find company after company reporting lower maintenance charges, whether due to better shop practices or to a larger percentage of modern cars. Little Rock, for instance, reports a reduction of 30 per cent, while El Paso maintains one-man cars for 1.58 cents a mile, though the equipment is not new.

In the progress toward the new day in electric transportation the rolling stock necessarily is of prime importance. The up and coming companies of today have selected their cars and buses in full realization of the fact that there are 22,000,000 deeply cushioned, pneumatic-tired private vehicles in use in the United States. Accordingly the trend is toward body design and equipment that provide luxurious comfort, ease and convenience for the rider. Slat and spring-cushioned rattan seats are giving way to leather upholstery with air cushions. Maple strip and cement flooring is being superseded by linoleum and rubber. Cabinets hide once obtrusive door engines, piping and valves. Noise diminution is studied, as in Birmingham, with resultant elimination of trapdoors, adoption of helical gearing and use of cork and cement filling for bolsters. From our sister utilities in the light and power field we are learning the value of good car lighting. The modern electric car provides well-diffused illumination of ample intensity with glare eliminated.

Car Development Has Not Stood Still

For exterior decoration the companies are seeking the color combinations that will meet the twofold purpose of attractiveness and visibility. Some, as in Grand Rapids, are reviving the fine old custom of naming cars after locally noted individuals or organizations, a pleasant gesture that helps sell rides and win public good will.

Except on the largest railways, 100 per cent one-man operation is in effect, or on its way. The favored car for this purpose is one seating from 44 to 48 passengers, such as Grand Rapids and other companies have found to make their best showing right in the automobile-owning districts. The industry needs a smaller unit, too, but it must be a better riding vehicle than the single-truck car of the past.

Without question this trend in car construction was stimulated by the bright colors and soft upholstery of the motor bus, but the buses themselves were far from perfect for mass transportation. They were too light and seating capacity was overstrained. The difference between independent operation with such equipment and operation of motor vehicles by experienced electric railway managements has been developed in many cities. A motor bus doing electric railway work requires the sturdiness and passenger-interchange qualities of a good street car. Hence the adoption of air brakes, treadle-operated rear doors and other features.

In one city development of a body with 50 per cent greater capacity—twenty seats—converted unprofitable operation into profitable operation on industrial routes. In other cities we learn that good judgment as to the capacity of buses on various types of routes marks the difference between success and failure. Standardization does not necessarily mean economy.

The line between the relative field of the electric car and the motor bus cannot be drawn definitely or permanently. If electric car development had stood still, the trolley may have disappeared from all but the largest centers by this time. But it has not stood still—it will not stand still.

If a small-town problem is to be solved, there is the example of Durham, where a deficit in 1925 promises to become a substantial surplus in 1927. There the management has retained rail operation only where the business justified, and has used the bus to replace unwarranted rail service. The encouraging fact here is that wise co-ordination proves there is a place for a popular price transport system even in a city of 45,000.

In the larger city of Norfolk is found the most drastic rerouting and interlacing of car and bus routes of recent years. The bus routes originated with "jitneys," partly parallel with car lines and partly in new territory. Nearly 15 per cent of the joint mileage was cut off in the rearrangement, the company reduced vehicle-miles approximately 10 per cent, yet carried 10 per cent more riders.

Schedule speed and traffic congestion are transportation problems in solving which the companies need and should have the hearty co-operation of the local authorities and the public.

Rerouting that has brought a 14 per cent improvement in service, combined with a more scientific system of traffic signals, accounts for the remarkable fact that the schedule speed of Chicago surface cars increased from 10.73 m.p.h. in 1921 to 11.18 m.p.h. in 1926.

We all know the serious effect the earlier traffic signal systems had on the schedule speed of street railways. The Chicago Surface management refused to suffer in silence. To it goes the credit for developing a most important improvement in signals, the use of which is declared to have increased the Loop district street capacity to 50 per cent.

The higher speeds here and elsewhere are encouraging because it is so often asserted that the rail-bound car is archaic; that the dodging bus is faster. This assertion is not borne out by the facts.

It is inspiring to note, in the face of increased traffic congestion, that nearly all the companies report reductions in the number and cost of accidents—results obtained through organized accident prevention work, prizes for safety ideas, co-operation with civic interests and safety publicity.

Improvement Made in Salesmanship

From the narratives of the contestants for the Coffin Award we can learn also how service has been placed upon a sound merchandising basis, backed up by salesmanship on the part of the utilities and their employees so that the essential convenience, comfort and economy of this means of transportation may be fully realized by the people served.

The range of publicity ideas and mediums is wide—newspapers, pamphlets, placards, posters, motion pictures, billboards, electric signs, floats in parades in almost endless train. Ride selling and good will building go hand in hand. Occasional radio broadcasts, at least, are common. Some companies engage outside talent for entertainment. Fort Worth, however, has its own quartet, its "Speed with Safety" band and now its "Interurban Theater Players."

Public good will is essential to utility success. Direct sale of the utility's service alone is not sufficient. It has civic duties in proportion to its importance in com-

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munity life. In this connection we find companies encouraging their employees to be active in civic organizations and movements, whether the purpose be a community chest, public safety, a hospital, an orphan asylum, or what not.

The man on the car is the company's representative to the thousands of riders. The increased attention to training him, not only in safe and efficient operation, but in selling rides and pleasing the public, is gratifying. A step in this direction is the greater latitude allowed conductors and operators in adjusting mistakes in the payment of fare instead of requiring the passenger to spend possibly half a day in a trip to an office to recover a few cents.

Salesmanship on the cars is gaining, too, with the gradual decrease in labor turnover. Unquestionably the combination of one-man cars and automatic equipment is attracting a finer class of men, while wages are at a point that makes them look upon their work more as a permanent occupation than as stop-gap employment. Contributing to this result also are group insurance; dental, legal and medical attention, sometimes free; improved surroundings, on and off the cars; subsidies for educational purposes, and opportunity to become partners in the business through purchase of stock on easy terms.

Financial Structure Simplified

On the financial side simplification of structure is important to the end that the electric railway may be self-sustaining and its securities more marketable. What has been accomplished in this direction? Grand Rapids' service-at-cost franchise, its financial reorganization with scaling down of fixed charges, and its improved service led to a declaration of dividends in August, 1927—the first since 1918—and this utility is dependent entirely upon revenue from transportation.

The Arkansas Power & Light Company, Little Rock, in simplifying its financial structure was able to issue 5 per cent bonds to replace issues at higher rates and to find new money through the customer-ownership sale of 7 per cent preferred. Confidence in the modernization program of the Chicago, South Shore & South Bend Railroad, a 90-mile interurban, was such that investment trust certificates were marketed at 4½ to 5½ per cent. In two years this company doubled its passenger bus business through the use of better cars, operated on shorter headways at higher speeds, in co-ordination with motor trucks and trailers.

All this goes to show that the electric railways are keeping everlastingly at it. We, of that industry, have the brains, the will and the energy to keep abreast of the most exacting requirements of the public, but we cannot do it alone.

We can provide the transportation—the cheapest form of transportation known—if we have the earnings. But we are only one party to the contract. However well we do our part, we cannot succeed unless the other party to the contract—the public—does its share also.

It has been demonstrated that the people are willing to pay for good service, but the electric railway has been the football of politicians so long that it is hard for them to realize that times have changed and that the best interests of the community require a rate of fare commensurate with the service demanded.

Coal Conserved by Chicago Surface Lines

WHAT has been accomplished along the lines of coal conservation in the shops and buildings of the Chicago Surface Lines without causing discomfort is related in the Coffin Prize brief of the company.

The following tabulations for 1926 and 1927 speak for themselves:

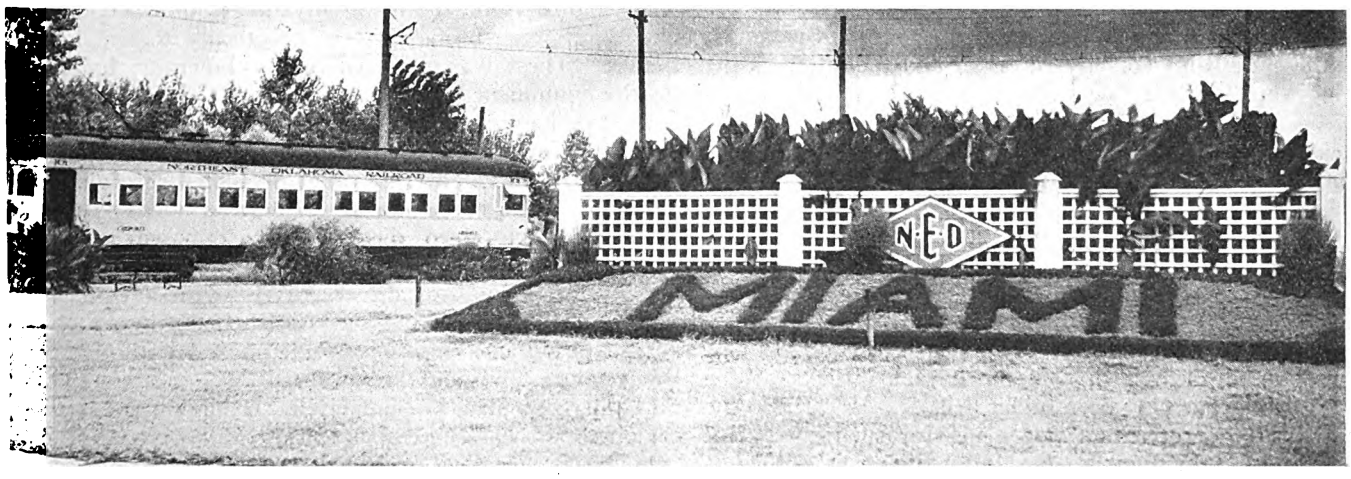
COST OF FUEL

Year 1923	
Mean average temperature, deg.	50.4
Carhouses—5,985.58 tons at $4.69 a ton	$28,072.37
Shops— 15,500.00 tons at $3.96 a ton	61,341.88
Totals—21,485.58 tons	$89,414.25
Year 1926	
Mean average temperature, deg.	47.9
Carhouses—4,927.56 tons at $3.70 a ton	$18,231.97
Shops— 9,808 tons at $3.92 a ton	38,490.80
Totals—14,735.56 tons	$56,722.77

This economy has been effected by the introduction of scientific firing instructions, careful supervision and greater care in the selection of the coal.

Picturesque Loop at Miami, Okla.

LANDSCAPE gardening has made a real beauty spot of the South Main Street loop of the Northeast Oklahoma Railroad, Miami, Okla. Not many of the railway passengers see this spot, because it is located on the outskirts of the city. On account of its location beside National Highway No. 66, the so-called "Main Street of America," it is seen daily by a large number of people from all over the country.



Attractive South Main Street loop at Miami is a good advertisement for the Northeast Oklahoma Railroad

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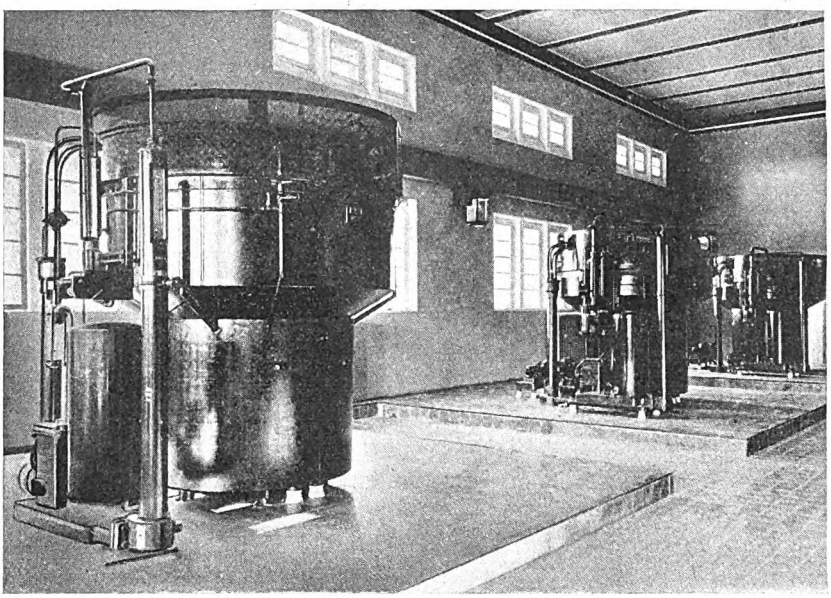
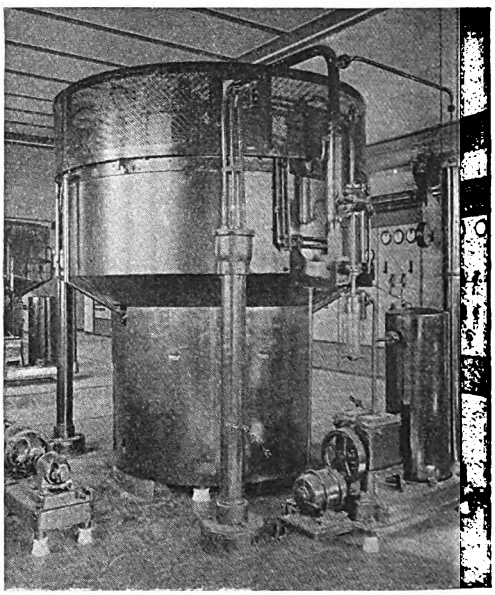
Berlin Is
Electrifying Its Stadtbahn

Direct-current third rail at 800 volts is being used. The entire system to be electrically equipped is equivalent to 316 miles

By Henry W. Blake
Senior Editor "Electric Railway Journal"



Interior of Hennigsdorf substation, equipped with rectifiers



Rectifier unit with vacuum pumping equipment

BERLIN is fortunate in having excellent connections for through transportation of passengers and freight. It is the center of the large trunk line railroad system of northern Germany and, situated as it is in a broad plain, the railroads enter from all sides. Physical connection between these various railroad termini in Berlin is provided by a four-track railroad, for the most part elevated, passing through the city and by another railway around it. The former railroad is known as the Stadtbahn (or city railway) and the latter as the Ringbahn (or belt line railway). Both were built between 1872 and 1882 and have since been operated by steam as part of the national railway system. Later, some suburban extensions were added, as shown on the map.

Reference was made in an article by the writer in the issue of this paper for Sept. 24 of the important rôle played by these lines in the local transportation system of Berlin and to the work now going on in their electrification for this service. The electrical equipment of these lines—at least of two of the four tracks of the Stadtbahn—has long been under debate. As early as the year 1899 a proposition was made for such equipment along American lines by the Union Elektricitäts Gesellschaft, but nothing was done, though permission was granted this manufacturer in 1903 to equip an experimental section 9 km. (about 5.6 miles) long.

As time went on the undesirability of steam operation, especially for the local service, constantly became more apparent. It became even more so when the Berlin elevated and subway system was built in that city by a private company and the many advantages of electric train operation were brought home practically to the Berlin public. There was a special reason, however, for delay in the equipment of the Stadbahn and Ringbahn. This was that the government railroad officials for their other railroad lines had adopted the single-phase system as standard. Although these other divisions were all practically long-distance lines, the government railroad authorities expressed themselves as opposed to introducing on their city lines the customary equipment for rapid transit lines of direct current with a third rail. Instead, a plan was drafted for their equipment with single phase and a sample single-phase locomotive was built for test purposes.

Under this plan, presumably, no change in the method of operation was contemplated; i.e., it was expected that the existing trailers would be attached to an electric

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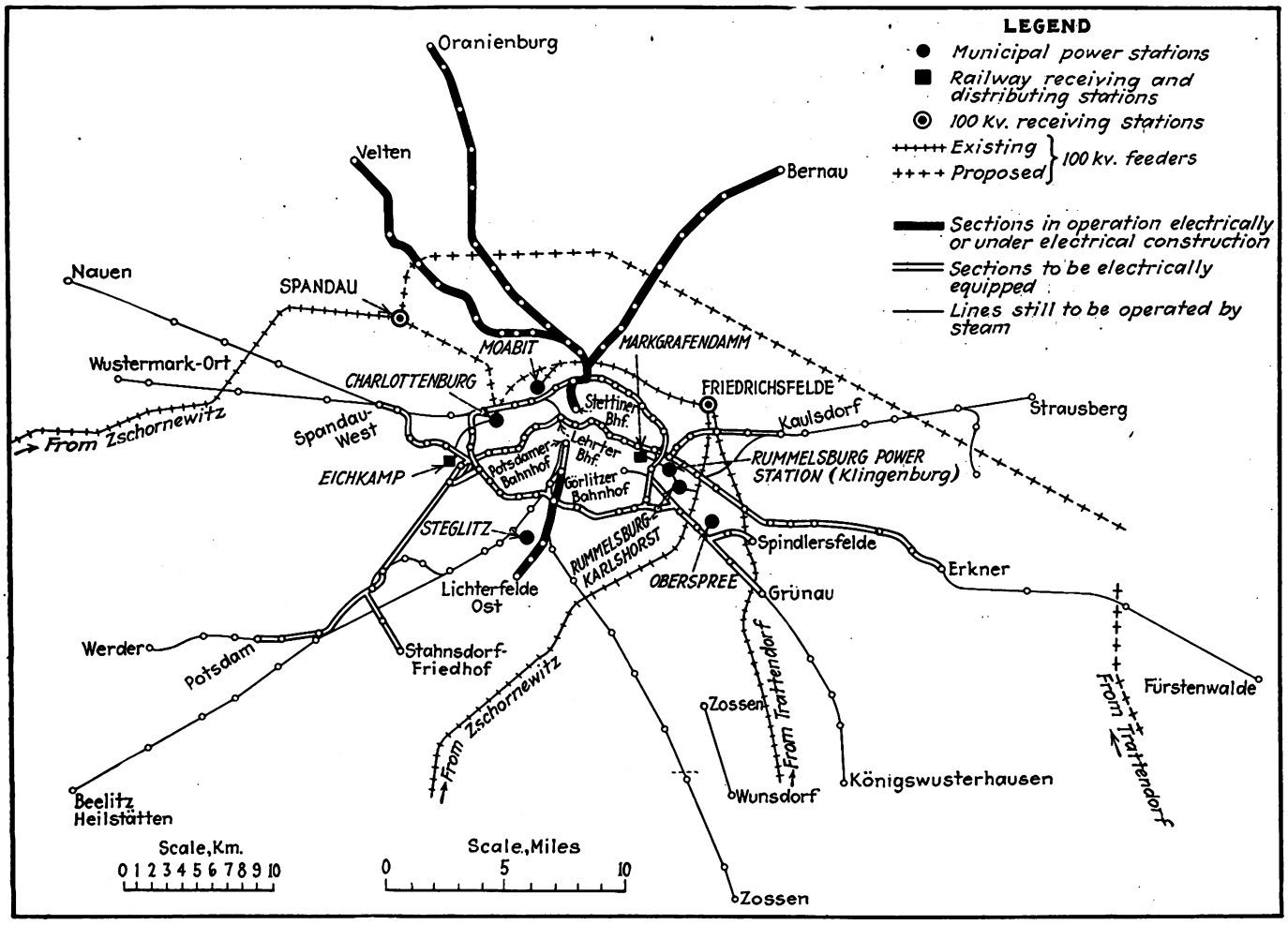

Map of Berlin and neighborhood showing Stadbahn, Ringbahn and Vorortbahnen (suburban lines), now being electrically equipped. The electrical distribution system is also shown

locomotive instead of to a steam locomotive. As it was obvious that such a train would not have anywhere nearly as rapid a rate of acceleration in frequent stop service as a multiple-unit train, the remarkable suggestion was put forward that the desired high rate of acceleration might be secured by these locomotives through the means of rack rails at the different stopping stations.

Direct Current Finally Adopted

As not much progress seemed to be made with the possibility of the use of single phase on the line, studies were begun about 1920 for the equipment of the line with 800 volts direct current and the purchase of new cars, since the existing cars had been pretty much used up during the war. This system was finally adopted with a voltage of 800, as the highest that could be used with simple motors and a simple design of third rail. With this system several parts of the line have been equipped. They are indicated on the accompanying map by heavy lines and are:

1. From Stettiner Bahnhof northeast to Bernau, equipped in 1924, 22.7 km. (14.2 miles) in length.
2. From the same railroad station northwest to Oranienburg, equipped in 1925, 29.2 km. (18.2 miles) in length.
3. Schönholz-Reinick to Velten, also northwest of Berlin, equipped in 1926, 21.5 km. (13.4 miles) in length.

The lines, the electrical equipment of which is still to be carried out, are shown by the double lines on the accompanying map. The steam routes are shown by single lines. The total length of the lines shown on the map as electrically equipped or so to be equipped is about 506 km. (316 miles).

The power for the three lines already equipped is taken from the Moabit station of the Berlin Municipal Power System, which obtains the greater part of its current from the brown coal power station of the National Electrical Works over a long-distance transmission line with 100,000 volts. As for the supply of the remainder of the power required on the railway system there was extended discussion. The State railway authorities, as the owners of the railway system, took the position that a single power station should be erected at Markgrafendamm, which is within the Ring or loop, but against this plan there was considerable public opposition, based both on engineering grounds and those of business desirability. The result was that a decision was finally reached to purchase all additional power needed for the city of Berlin rather than to build a new station. The contract, which was signed in 1927, provides that both the existing national electric power stations and the municipal power station shall supply half of the power. Each will act as a reserve to the other.

The national power station contracts to supply power from its large stations at Golpa, Trattendorf and Lauta, in the mid-German brown coal region; the city system from its Berlin power stations at Rummelsburg, Charlottenburg and Moabit, as shown on the accompanying map. The total capacity available in both groups of stations mentioned is about 800,000 kw., and the con-

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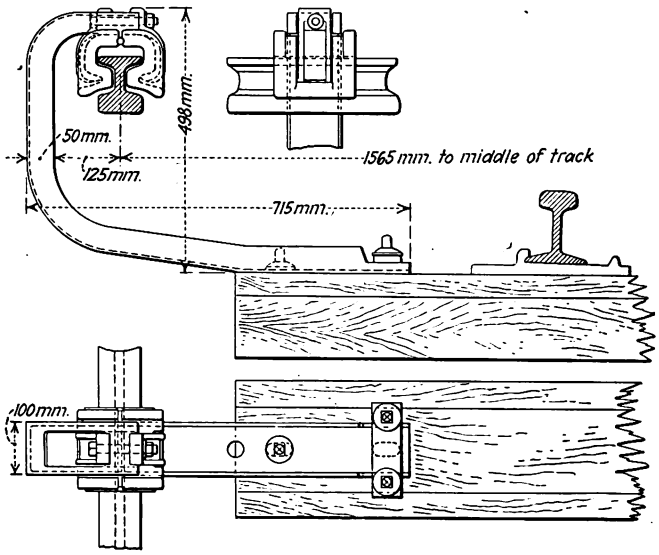
tinuity of the supply is considerably more certain than from a single station owned by the railway itself. The requirements of the railway system will be about 80,000 kw. installed load and about 240,000,000 kw.-hr. yearly energy consumption. The power contracts require the stations to be ready to supply the power on April 1, 1928, and are to come in full force in 1929.

Energy will be paid for on a readiness-to-serve basis, plus a service charge. The readiness-to-serve charge is based on the cost of the generating equipment required at the maximum hourly peak. There is also a coal clause by which an adjustment will be made for any considerable changes which may take place in the price of coal. Penalties are provided in case of failure of the supply.

Power Transmission

For the long-distance transmission four double circuits of 100,000 volts will be used from the brown-coal station to Berlin. From common junction points in Charlottenburg (in the west) and in Rummelsburg (in the east) the power is taken to the railway's two distributing points, at Halensee (in the west) and Markgrafendamm (in the east). From here the railway distributes at 30,000 volts to its several substations and from there to the trains.



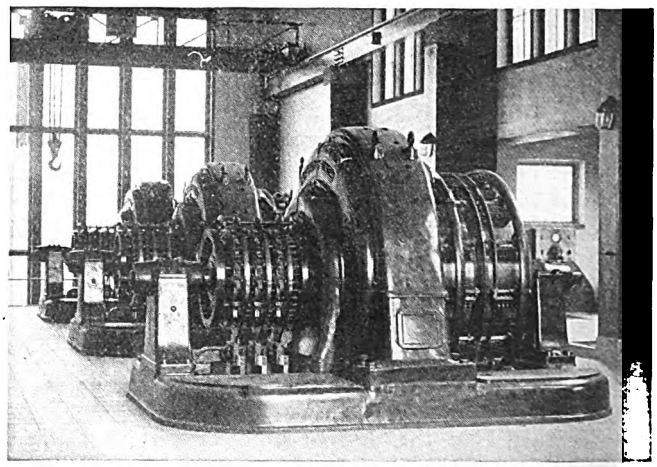
Under-running 800-volt third rail with protector

Since the oil switches of the substations of the railway cannot with safety take care of the enormous amount of energy of the interconnected large power centers, the contract provides that the railway generators in the several power stations shall be on circuits separate from the other generators and shall be provided with separate bus systems. The two generating stations, one supplying power to the western half of the railway system and the other the eastern half, are not designed to be connected together except in emergency, though in the future it is planned to connect them electrically through reactors. The railway, which owns the feeder system, has installed in each of its two feeding sections a dispatching station, one at Halensee and one in Markgrafendamm.

Before the plans of a standardized supply system had been completed the energy required by the three existing northern rail lines was temporarily supplied by the municipal power station at Moabit in the form of 30-kv., three-phase current. Some of the railway substations receiving this power are equipped with rotary converters. One of these, that at Pankow, is illustrated. The rotary converters, built by the Bergman Company, have an output of 2,000 kw., at 800 volts, and 2,500 amp. continuous rating at a speed of 500 r.p.m. The other substations, as well as those to be built in the future for lines to be electrified, will be equipped with mercury-arc rectifiers, as it is considered their reliability is now proved.

The rectifiers now being installed for the Ring- and Stadtbahn are being supplied by Brown, Boveri & Company, while those for the suburban sections come from either the A.E.G., Bergman or Siemens-Schuckert works. A view is given of the rectifier station at Henningsdorf. The three mercury-arc rectifiers here were built by the A.E.G. and have a continuous output of 1,500 amp. at 800 volts, or a twenty-second output of 3,000 amp. at 740 volts repeated every two minutes. One of these rectifiers with its pumping equipment is shown by itself in another view.

As explained, all direct current for the Ringbahn and Stadtbahn is converted by means of rectifiers. In every substation of these divisions there are two rectifiers and the necessary transformers and switching equipment. Each track has its own rectifier equipment, so that the power supply for the track in one direction is separate from the power supply of the one in the other direction. The third rail is also divided into as many sections as there are substations. This arrangement was adopted because it was not considered wise to connect too many of the rectifiers on the d.c. side in parallel. It was feared that in case of overloads backfiring of the rectifiers might occur, in which case all the parallel connected rectifiers would feed into the backfire short-circuit. Those sections which are normally operated in parallel can, if so desired, be separated electrically from one another. On account of the less dense traffic on the suburban sections their current supply is in one single system.



Interior of Pankow substation, equipped with rotary converters

The rectifier stations along the Stadtbahn are located in the archways underneath the structure, while those on the Ringbahn are in small buildings. All of these stations are automatically operated, with a remote control developed by Siemens & Halske.

The oil switches of the rectifier stations were supplied by Voight & Haeffner in Frankfurt a.M., while the quick-opening circuit breakers were made by the manufacturers of the corresponding rectifiers. These breakers open the circuit in less than 1/100 second, provided there is relatively small back-current (backfire).

To provide further reliability in case of breakdown, a portable rectifier station is also being built and will be installed on a twelve-wheel car with trailer. This port-

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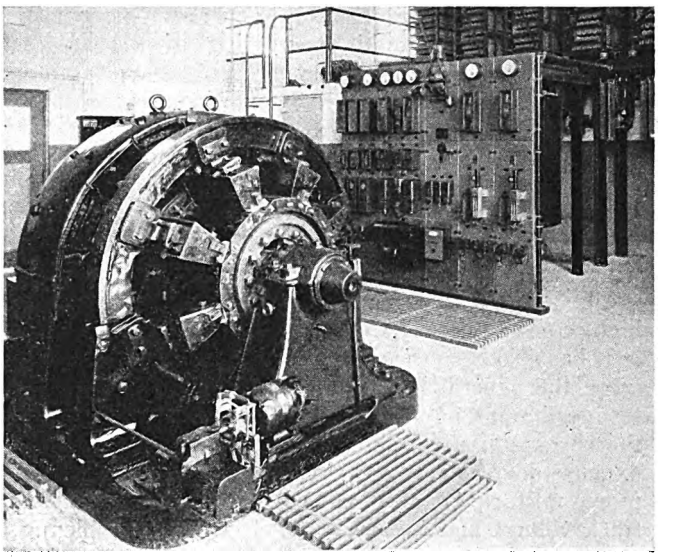
able substation can be placed in front of any one of the rectifier stations and can be connected to the 30-kv. supply by an external cable. There will also be a central repair shop for all of the rectifier equipment adjacent to the Markgrafendamm substation.

Under-Running Third Rail Used

Current for the trains is distributed by an under-running third rail similar to that used on the d.c. system of the New York Central Railroad and later employed on the Hamburg Elevated's suburban lines. The third rail is of 5,100 sq.mm. cross-section of soft iron and is protected above by a wooden plank. The negative pole of the rotary is connected to the third rail, the positive to the return circuit, so that the cathodes of the converters can be grounded. The rail joints are bonded by short brazed copper bonds to form the return circuit. Before the new track was laid the rail ends were also sprayed with molten zinc to prepare them for the so-called zinc method of rail bonding. This method has also been used by the Berlin and Hamburg elevated lines, but it is doubtful whether it is of any great value.

Particulars of the car equipment and other details will appear in an early issue of this paper.



The substation is equipped with 1,000-kw. General Electric synchronous converter, automatically operated

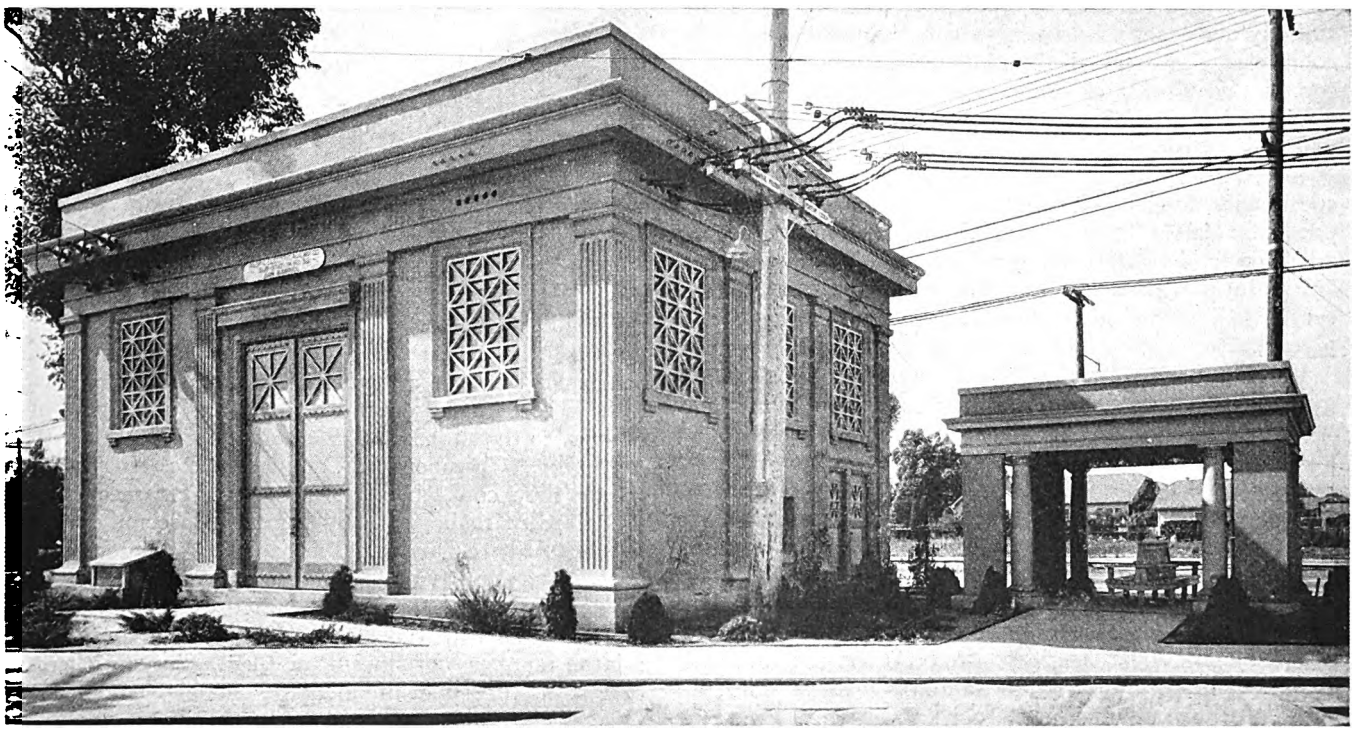
Another Automatic Substation on the Pacific Electric

Placing of San Gabriel station in commission brings total power automatically controlled up to 25 per cent of the company's supply

WITH the placing in service of the newly erected San Gabriel automatic substation, the Pacific Electric Railway has taken another step forward to provide the latest and best equipment for power distributing service. The San Gabriel substation was officially placed in service June 15 to serve that section of the line together with the Temple extension. It is located at Las Tunas Drive and Shore Road in the city of Temple. It is designated as No. 52 and is equipped with a 1,000-kw. General Electric synchronous converter.

This new substation makes the fifteenth automatically operated substation now in operation on the system. All of the automatic equipment excepting one 1,500-kw. unit is operated in 600-volt service. The unit excepted is operated on the 1,200-volt section of the system. The total installed capacity of all the substations, both manual and automatic, is 69,405 kw. Of this amount, 17,750 kw., or approximately 25 per cent is automatically operated.

Automatic stations are operated in parallel with manually controlled stations and prove of extreme importance in their respective zones in assisting to re-establish serv-



San Gabriel substation No. 52, recently placed in service by the Pacific Electric Railway

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ice when there is an alternating-current power failure. The positive and rapid functioning of the automatic switching and control equipment restores the automatic station to service under normal conditions several minutes ahead of the manual stations.

The Pacific Electric Railway has adopted a definite policy of installing automatically operated equipment in all new substations, whether to serve new extensions or added facilities for present lines, except in substations which are important power delivery centers and which would require an attendant in any event to handle the high-tension line switching.

It has also been the policy to observe what has now become the general tendency in railway practice; that is, to install single-unit stations, located at the load centers, thereby materially reducing the otherwise heavy feeder expense, increasing the distribution efficiency, providing a more uniform trolley voltage, reducing the negative track voltage and the resultant electrolysis problem.

Maintenance and Inspection Schedule

The maintenance of and particularly the methods and systems of inspection for automatic substations have received very careful study as a high standard of service is expected and must be obtained from the equipment. Apparently the complicated system of relays and contactors offer many sources for failure, but actually the reliability of the devices has been developed to the extent that failures are remarkably few.

An inspection schedule has been devised which has proved very effective in maintaining the required routine for properly inspecting and maintaining the stations. The inspection and general maintenance of the stations is performed by six automatic substation inspectors, which includes one inspector in a supervisory capacity having charge of all inspections, who in turn reports to the chief operator of all the substations. The work has been equally divided so that the various inspections and other duties scheduled can be performed regularly.

In general the substations are visited once a day and given a general inspection without shutting down equipment. Twice a week the equipment is shut down, cleaned and any necessary adjustments made. Small car-type air compressors are installed at all substations to furnish compressed air for cleaning.

A card system has been arranged for each station which is a positive guide to the inspector as to his duties. A schedule indicates the card number, which in turn specifically describes the duties to be performed on any particular date. The card index in each substation shows when each piece of equipment was inspected and when any failures occurred and adjustments were made. This service is a good guide as to the adequacy of the attention given the equipment as well as any weakness in it.

Each substation is equipped with a combination graphic-recording direct-current voltmeter and ammeter with extra pens that show in the same chart when the alternating-current starting and direct-current line contactors came in.

The automatic substation inspectors are selected from the ranks of the manual substation operators and are men who are particularly adapted to this class of work, as well as being thoroughly familiar with substation equipment and distribution characteristics of the system. While the inspectors are responsible for the general maintenance and condition of the automatic substations, all heavy repairs and overhauling work are performed by the regular substation maintenance crews.

How Birmingham Company Cares for Conventions

In its 1927 Coffin brief the Birmingham Electric Company tells of the special facilities it provides when conventions meet in Birimingham

WAYS in which the railway gives traveling information to delegates during the large conventions held in the city are outlined in the brief which the Birmingham (Ala.) Electric Company filed for the 1927 Coffin Prize. One of these conventions during the past year brought 30,000 visitors, and another 10,000 visitors, to Birmingham.

As an aid to traffic at these times a booklet published by the company and entitled "Places of Interest in Birmingham and How to Reach Them" has been found most useful. This booklet contains a classified list of all important parks, theaters, places of amusement, manufacturing plants, hotels, etc., in Birmingham, with directions as to how they may be reached by street cars. The schedules and routes of each street railway line are shown. In the back of the book is a folded map of the city and its environs, showing the routes of all street car lines.

Prior to a recent convention a copy of this booklet was given to each trainman with a letter from the superintendent, urging him to familiarize himself with the contents and consider himself a committee of one to furnish all available information to convention delegates and other strangers. Each police officer in the city also received a copy of the book with a similar letter from the Chief of Police.

Information booths were erected on one of the principal downtown corners and at the Municipal Auditorium, which served as convention headquarters. Specially trained men from the transportation department were stationed in these booths. They wore neat uniforms with "Street Car Information" lettered on their caps in gold braid. Besides giving information about trolley schedules, they also kept themselves informed as to the convention proceedings, the arrival and departures of trains, etc. Their services were commended by local people as well as by many strangers, showing this service was appreciated. Pamphlets giving the routes and terminal leaving times of each line were also distributed freely among the delegates. By the pursuit of this policy, it is believed that many strangers in the city who would otherwise have used taxicabs were enabled to use the street cars.

In addition to the small maps mentioned, the company some time ago issued a large map showing its lines and all principal points of interest. Framed maps of this kind were then presented to the hotels for display in the lobbies, to the railroads to be hung in the stations, to the Y.M.C.A., Chamber of Commerce, etc., to be placed where they could be consulted. The frames of these maps are of mahogany and bear the inscription in gold letters, "Where Do You Want to Go? The Street Cars Will Take You There." The point where the map is displayed is marked in red on each map.

These maps proved so popular that the company had a large number of requests for them. Among them was one from the superintendent of schools, who asked to have one of these maps hung in each of the 70 public schools in the city.

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Insurance Problems

of Motor Vehicle Common Carriers

By Henry Swift Ives
Vice-President Casualty Information Clearing House, Chicago, Ill.

Speaking before the National Association of Railroad and Utilities Commissioners at its annual convention held at Dallas, Tex., Oct. 18-21 Mr. Ives discussed some of the difficulties encountered in connection with the underwriting of liability and other insurance for motor carriers. The following article is an abstract of his paper.—EDITOR.

MANY stock casualty companies backed by sufficient reserves and equipped with proper service facilities to handle motor vehicle common carrier liability insurance are very shy about writing this kind of business. The rates charged usually are considered extraordinarily high by the buyers and hardly high enough by the insurance company. The immediate problem, then, is how sound liability insurance protection may be made available at a price sufficiently low to work no hardship on the operators and at the same time at a price which will permit insurance underwriters to engage in such undertakings expecting to provide sound protection and efficient service at a reasonable profit.

Two outstanding difficulties must be overcome in stabilizing this liability insurance, both of them being within the regulatory authority of the state railroad and utilities commissioners. They are, first, reduction of accidents through safety measures, and, second, simplification, clarification and uniformity of insurance regulations.

ACCIDENT REDUCTION

There can be little hope, in my opinion, of any material reduction in the cost of liability insurance until there is a decided reduction in the present accident frequency due to the operation of motor vehicle common carriers on the public highways. Several bus lines operated by steam or electric railways during the last year have made admirable accident prevention records, and the same is true of a few scattered so-called independent companies. However, there is much room for improvement, and for the general average of independent operators there isn't much to be said except that they have difficulty in getting even poor insurance at a high rate. Anyone familiar with passenger buses knows of their high rates of speed. How, indeed, can a bus operator expect an insurance company to protect him at a low cost, or at any cost, against the tremendous potential risk assumed when a crowded bus goes thundering and dodging along congested public highways at express train speed? Even under existing rates the insurance of this kind of public transportation has been far from profitable or desirable from the standpoint of the leading stock casualty companies.

Concerning accident prevention, there are some safety requirements, in addition to speed regulation, which seem to be of importance, as follows: Drivers should be carefully picked and not under 25 years of age. The roads over which motor vehicle common carriers operate should be suitable and no certificate should be granted for operation of an inherently dangerous highway. All employees of the transportation company should be trained in safety work and accident prevention. The company should have inspectors constantly on the job detecting violators of safety codes and recommending improvements. In the Northern states great care should be exercised in road clearing for winter operations. There should be some regulation of competitive lines covering the same route, as speed is often an influential factor. The mechanical condition of all vehicles should be perfect. State utility commissions should have a force of inspectors seeing that all safety regulations are being enforced.

INSURANCE REGULATION A "MESS"

The present situation as to insurance regulation can aptly be called a "mess." This is due to the sudden growth of this sort of transportation and the hurry with which its problems had to be met. Each state has its own statutes, rules and regulations, adopted with little or no reference to any other state. Some of them are good, some bad and some of indifferent value, but the lack of uniformity is costly to bus operators and vexatious to insurance companies. This is particularly true in the case of interstate operations, where both the transportation agency and the insurance underwriter are compelled to go to considerable expense in meeting the diverse and often conflicting requirements of the various states through which the business is conducted.

Another feature of this situation deserves attention. Because again of this lack of uniformity in regulation no pure premium statistics are available and there is not today any adequate statistical data upon which proper rates may be predicated. The experience in any one state is of necessity limited and seldom is of sufficient volume to form a background for local rates. In trying to arrive at a national or sectional tabulation to form a rate basis it is also found to be impossible to adjust the $5,000 maximum liability for any one bus in New York to the maximum of $75,000 in Wisconsin, of $80,000 in Nebraska and $25,000 in Colorado. To write liability insurance scientifically there must be present a body of experience sufficient to afford a basis for judgment concerning the probable loss ratio. That body of experience is not available at present and hardly can be until there is some uniformity in regulation. The National Bureau of Casualty and Surety Underwriters has been working on this problem for a long time, but as yet has not been able to promulgate a rate manual which is or can be literally followed by the subscribing companies. As a result rates more often are determined through individual bargaining between the insurance underwriter and

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the insured. This largely could be corrected by uniform statutory and commission regulation such as has been suggested.

The accompanying table shows some examples of the wide variation in public liability and property damage limits required in several states.

Motor vehicle underwriting is an extremely hazardous one and there has been general complaint that some of the insurance organizations engaged in the business have either collapsed when faced with large losses or have failed properly to settle just claims. The stock insurance companies were organized to write this kind of business, they want to write it and will write it freely and at satisfactory rates if conditions are such as will permit them doing so without jeopardizing their solvency or their service.

You will note that in my remarks I have confined myself to discussing liability insurance and its running mate, property damage insurance. I have not tried to distinguish between them or to discuss bonds as a substitute for them or to distinguish between bus and truck insurance or bonding. The same general principles cover all of these factors, although the problems as to insuring or bonding truck common carriers licensed by the state are not nearly as acute as those affecting bus insurance.

In conclusion, there are two related matters which I wish to call to the particular attention of the members of this association.

Interstate Operation

The first has to do with the interstate operation of motor vehicle common carriers. In my personal opinion a uniform system of insurance regulations worked out and adopted by the state commissions in co-operation with the insurance companies and the transportation operators will do more to counteract this demand than any other plan that could be devised. If, for example, Illinois, Indiana and Michigan had the same safety code and the same insurance requirements in connection therewith there would be no possible need for federal control of the Chicago-Detroit bus lines. There is hardly a phase of bus operation, except possibly rates, that cannot be regulated by rulings of the state commissions in connection with insurance contracts.

Speaking as an individual solely, and not as a representative of any insurance organization or company, I am opposed to any further centralization of power in Washington unless absolutely necessary. In this particular instance I see no immediate necessity for federal intervention and I hope that necessity may never arise. Some of these alleged public necessities, however, often are manufactured to meet certain needs, and it seems to me that this may be one of them. It stands to reason that if the Interstate Commerce Commission begins to regulate buses and trucks in interstate business it will not be long before it regulates buses and trucks owned by the same operators but engaged in intrastate business. To my way of thinking the best way out of this dilemma is for the state commissions to adopt uniform safety and insurance codes under which buses and trucks may be controlled no matter how many states they pass through, the insurance contract being the key to the situation.

Public Ownership

The second of these two related matters has to do with the ever-present agitation for public ownership. Because of the inability of certain motor vehicle common carriers to obtain adequate insurance at what they believe to be fair rates there has grown up in some quarters a demand that the states go into the business of writing that kind of insurance, thus diverting losses to the pockets of the taxpayers.

I wonder if you realize the danger involved in any government ownership scheme affecting insurance. I am sure you do as to other industries said to be affected with a public interest, but I hardly believe that you ever have visualized the much greater danger to our fundamental institutions which lies behind the socialization of insurance, and I also doubt if the motor vehicle common carriers who may have suggested such a scheme realize the social and economic outcome if they should win their point. Assumption of risk is the most essential element in the production of wealth and the institution of insurance is the risk bearer of industry. Eliminate insurance as a factor in business and our whole well-knit industrial system would collapse. Repress it unduly or stifle its growth and every individual in the social organism will suffer.

PUBLIC LIABILITY AND PROPERTY DAMAGE LIMITS IN SEVERAL STATES

State	Seating Capacity of Bus	P.L. Limits	P.D. Limits
New York	All buses	$2,500/ 5,000	$500/1,000
Onio	7 passengers or less	6,000/12,000	1,000
	8-12 passengers	6,000/18,000	1,000
	13-18 passengers	6,000/24,000	1,000
	19-24 passengers	6,000/30,000	1,000
	More than 24 passengers	6,000/36,000	1,000
Colorado	12 passengers or less	5,000/10,000	1,000
	13-18 passengers	5,000/15,000	1,000
	19-24 passengers	5,000/20,000	1,000
	More than 24 passengers	5,000/25,000	1,000
Wisconsin	6 passengers or less	10,000/20,000	No P.D.
	7-15 passengers	10,000/40,000	No P.D.
	16-24 passengers	10,000/50,000	No P.D.
	More than 24 passengers	10,000/75,000	No P.D.
Nebraska	12 passengers or less	5,000/20,000	1,000
	13-20 passengers	5,000/40,000	1,000
	21-30 passengers	5,000/60,000	1,000
	More than 30 passengers	5,000/80,000	1,000

Akron Lays New Track in Record Time

WORKING day and night, from a Monday morning until the next Friday morning, the Northern Ohio Power & Light Company recently laid a new double track on Main Street, Akron, from State Street to Exchange Street, covering ½ mile. While the work was in progress 65 cars every hour passed over a temporary track on that street.

The first step was putting down the temporary tracks Monday morning. Then came the removal of the old tracks and the old concrete. A concrete breaker and a steam shovel removed old slabs of concrete weighing as much as 500 lb.

The same type of construction marked this job as used on all other track laying being done by this street railway. There is a 10-in. concrete base with 95-lb. steel rails, all welded, steel ties and brick pavement.

The trench was graded, the foundation and new rails were put in and finally the concrete and paving. The concrete work was all done between 5 o'clock one afternoon and 10:30 o'clock the next morning. The joints were thermit welded between 7 o'clock in the morning and midnight.

The Main Street "white way" supplied sufficient light for the night work, making it unnecessary to put in floodlights. Thousands of persons gathered along the sidewalks both day and night to watch the work. The city co-operated with the plan to finish the job as quickly as possible by routing all vehicular traffic off the streets.

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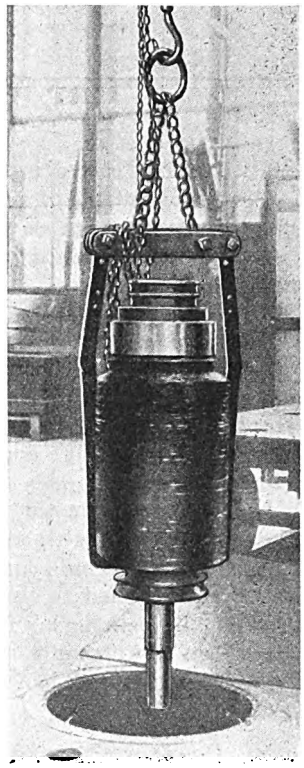
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—25

Adjustable Sling for Armatures

WHERE the end method of dipping armatures is used, some type of sling or support is desirable for handling during the dipping operation. The accompanying illustration shows an adjustable sling used in the shops of the Grand Rapids Railroad, Grand Rapids, Mich. It consists of two arms with hooked ends at the bottom that grab under the end bell. The tops of these arms are drilled with three pairs of holes, so that a crossarm can be inserted to support the upper end of the shafts of armatures of different sizes. The illustration shows the crossarm in the top set of holes. Where shorter armatures are dipped, it is moved down to a position to accommodate the shorter shaft. The side arms are made of 1¼-in. x ½-in. stock, and the crosshead at the top is in two pieces bolted together to form openings at the ends for the side pieces and to provide an opening in the center for the shafts.



Armature held by adjustable sling while being dipped in the shops of the Grand Rapids Railway

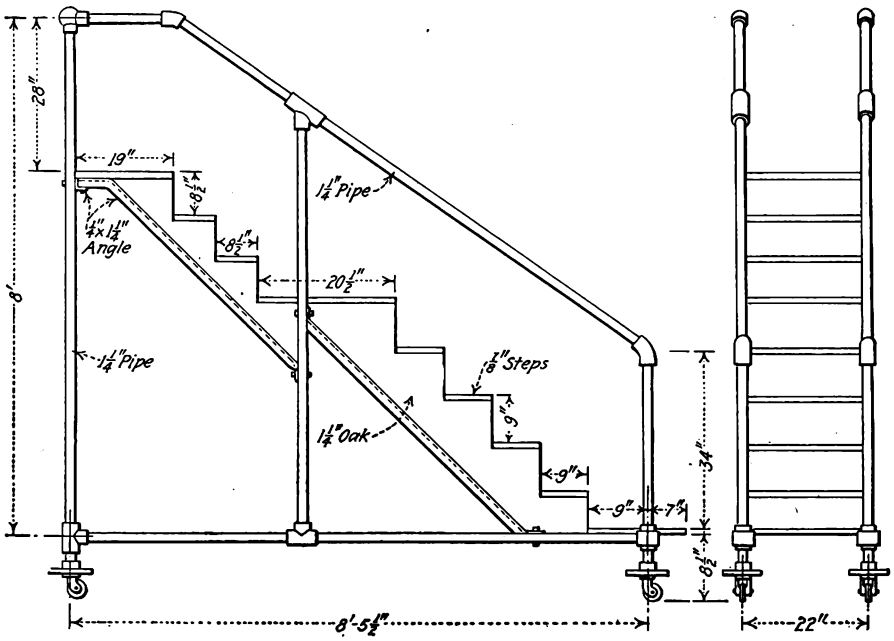
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—PAINT SHOP—3

Rolling Steps to Replace Scaffolding

IN ORDER to speed up painting without the need of scaffolding, many railways are using some kind of a portable platform. The accompanying sketch shows the rolling steps designed and built in the shop of the Louisville Railway, Louisville, Ky., by John Zoll, master mechanic.

The framework is made of angles and pipes with four casters to permit easy rolling about the shop. Cross angles ¼ in. x 1¼ in. are bolted to the frame and support ¼-in. x 1¼-in. angles to which the 1¼-in. oak step risers are fastened. A 1¼-in. iron pipe railing starts from the bottom step and extends upward so as to surround the platform. This protects the workman, especially when he must reach over to paint some place difficult to reach. The stairway is 22 in. wide from center to center of handrail. There are two platforms, one at the sixth step and the other at the top. The painters can work at two different levels.



Painters can work rapidly at two heights with this movable platform built in Louisville

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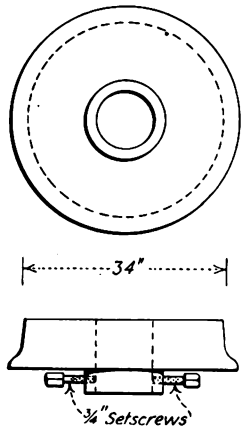
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—26

Car Wheel Used for Bearing Chuck

SIMPLE but effective is the chuck for internal boring of motor axle bearings that has been developed in the shop of the Washington, Baltimore & Annapolis Electric Railroad by J. A. Mellor, master mechanic. This chuck consists of a standard 34-in. steel wheel bored to fit exactly the external diameter of the axle bearings. Two ¾-in. set screws are installed diametrically opposite in the wheel hub.

A bearing to be bored is placed in the wheel bore with the flange resting against the hub, and the set screws are tightened to prevent the turning of the bearings. The wheel is placed on the boring mill table and the bearing bored out in the same manner as a wheel axle fit. Since this chuck is self-centering considerable time is saved in the lining up and boring process.



General appearance of car wheel axle bearing chuck used by W., B. & A.

In the W., B. & A. shop one man takes care of all of the wheel boring work. Frequently there is not sufficient wheel work to keep him busy throughout the entire day, in which case the bearing wheel chuck is placed in the boring mill and bearings are bored out.

The chuck has been in use for about a year and has proved very satisfactory. Due to its self-centering feature bearings can be bored rapidly and accurately. This chuck has provided a means for keeping the boring mill and operator busy.

Electric Railway Journal Maintenance Data Sheet

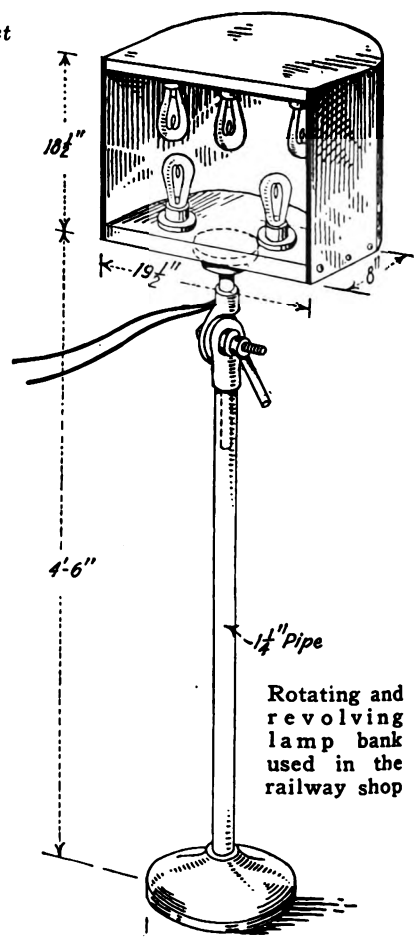
ROLLING STOCK—PAINT SHOP—4

Adjustable Portable Lamp Bank

REALIZING the importance of proper illumination as a vital factor in securing good workmanship led C. W. Wood, master mechanic of the Virginia Public Service Company, Hampton, Va., to design for use in the railway's shops the lamp bank shown in the accompanying sketch. It is portable and will permit of light reflection in almost any direction. It can be revolved 360 deg. horizontally or rotated approximately 300 deg. vertically. A substantial conical cast base, ¾ in. thick and of 14 in. diameter, gives the unit a low center of gravity and prevents it from being tipped easily. It is 6 ft. ½ in. over all. A 1¼-in. and a ⅞-in. semi-circular oak plank are spaced 18½ in. apart and incased on the curved surface with ⅛-in. sheet iron. This sheet iron cover is fastened to the oak blocks with wood screws and the inside finished with aluminum paint for reflection.

Three lamps are installed on the upper or ⅞-in. plank and two on the lower or 1¼-in. plank. A 1¼-in. pipe is connected to the base and the lower lamp support through a floor flange and an adjustable locking joint. This joint contains a lever by which the lamp can be adjusted to any desired angle and locked at the fixed point. The lower part of this adjustable joint is turned to a smaller diameter and set inside of the 1¼-in. pipe, the shoulder of the turned section resting upon the wall of the pipe. This permits the lamp to be revolved freely to any desired position. The lamps are wired five in series and the wires enter the lamp stand through the upper portion of the adjustable joint.

This stand has been found very useful in the paint shop and very often it is used by the maintenance of way department, for night reconstruction work.



Rotating and revolving lamp bank used in the railway shop

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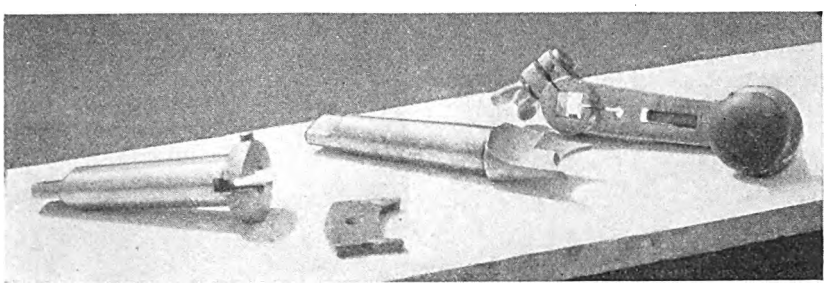
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—27

Fish-Tail Cutter for Knobs

FOR finishing bolt heads or knobs which have a rounded surface a tool which has been termed a fish-tail cutter has been devised and is used in the 39th Street repair shop of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. The tool consists of round tool steel flattened down at the ends and provided with cutting edges so as to finish material to the desired radius.

The accompanying illustration shows a pair of these fish-tail cutters such as are used for finishing the ends of the red fiber knobs used on master controller handles. These knobs have a concave finish at one end and a convex finish at the other. The tool shown at the left is used for finishing both of these surfaces. It consists of two parts, the tool holder and the cutting portion. When placed in the holder the cutting portion is clamped in position by a set screw. It will be seen from the shape of the two ends of this cutting tool that one will give a convex finish and the other a concave finish to the handle knob.



Fish-tail cutter as used for finishing the knobs of master controller handles

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL DIAGRAMS—3

Armature Winding Diagram for Westinghouse 306 Motor

PROPER winding of Westinghouse type 306 railway motor armatures is shown in the accompanying diagram. It is very important that connections be made correctly whenever the armatures are rewound.

To Lay Off Winding

1. The center line of the starting coil is on the center line of the armature tooth between the fourth and fifth slot and on the center line of the mica between the 30th and 31st commutator bar.

2. Starting at bar No. 30, count back clockwise to bar No. 1 and in this bar place lead No. 2, the first active coil, from the bottom leads of the starting coil.

3. Count from bar No. 1 counter clockwise to bar No. 58 and in this bar place lead No. 2, the first active coil, from the top leads of the starting coil.

Winding Data

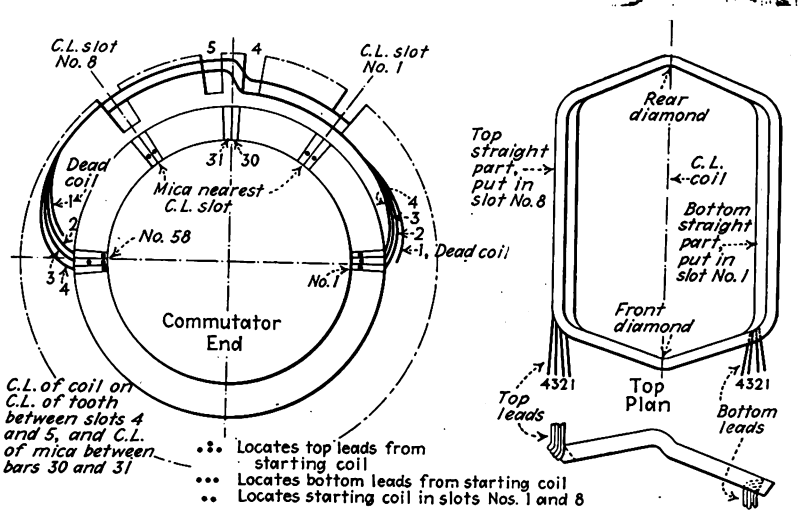
Number of armature slots, 29.

Number of commutator bars, 115.

Coils lie in slots Nos. 1 and 8.

Leads connect to bars No. 1 and No. 58.

For convenience in rewinding it is the practice of many of the manufacturers to center punch commutator bars on the end. The accompanying diagram gives the center punch marks that are standard for this motor.



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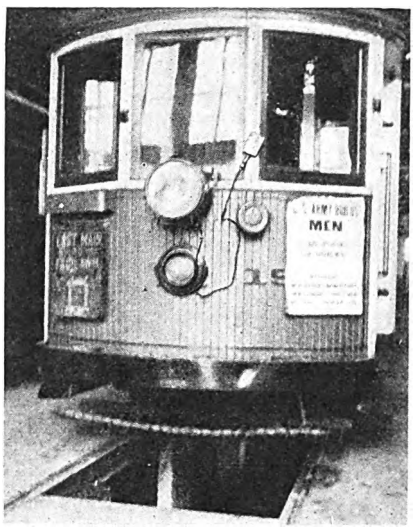
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL DIAGRAMS—4

Arc Headlight Receptacle Removed from Splash

CONNECTION for the arc headlight on certain cars of the Connecticut Company has been changed from a position near the bottom of the front dasher to a position about one-quarter way up from the bottom of the off-side front vestibule window post.

The work has been done at the New Haven shops of the company. This connection consists of a wood block surrounding a porcelain receptacle.



Headlight connection on front vestibule window post is well removed from splash

A flexible wire terminating in a plug connects the receptacle and the arc lamp, which is supported on a horizontal iron bar on the dasher immediately below the middle front window. This bar is grounded and furnishes the other electrical connection for the lamp. In its new position the receptacle is not subjected to splash from the truck and roadbed as it formerly was, and its maintenance in good condition is much simpler and easier.

Electric Railway Journal Maintenance Data Sheet

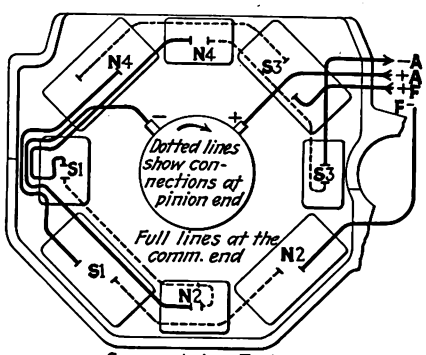
ROLLING STOCK—ELECTRICAL DIAGRAMS—4

Field Winding Diagrams for Westinghouse 306 Motor

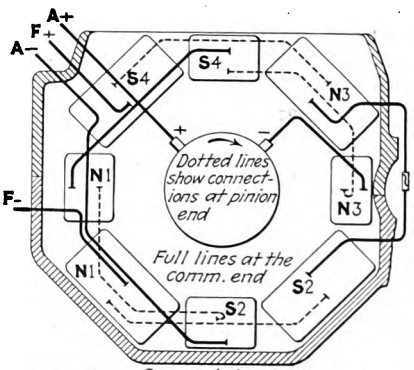
DIAGRAMS shown herewith are for wiring of the Westinghouse type 306 railway motor with commutating poles, which is used quite extensively. The diagram to the left is for motors with leads on the axle side and the diagram on the right is for motors with leads on the suspension side.

To insure that the pole faces of the motor have proper sequence of polarity it is necessary that the coils be installed correctly and it is desirable that they be given a polarity test. Time and labor are saved if such a test be made before the coils are installed with them laid out on a bench. Another test should also be made after they are assembled.

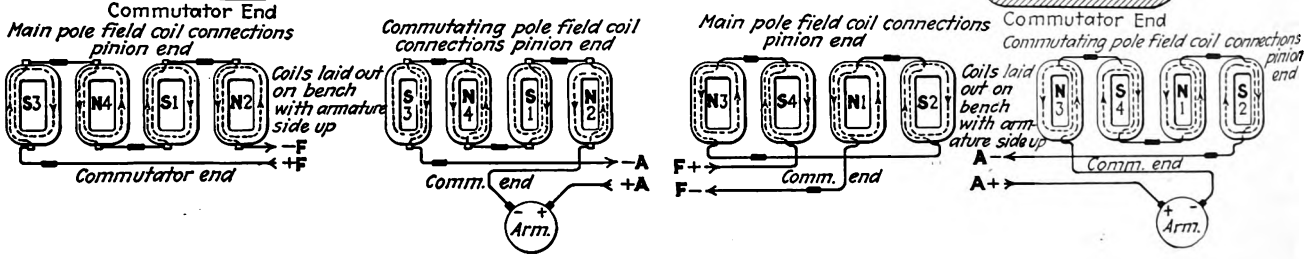
In the accompanying diagram, *N* stands for north pole and *S* for south pole. Polarity should be checked with a compass while current is being passed through the coils.



Commutator End



Commutator End



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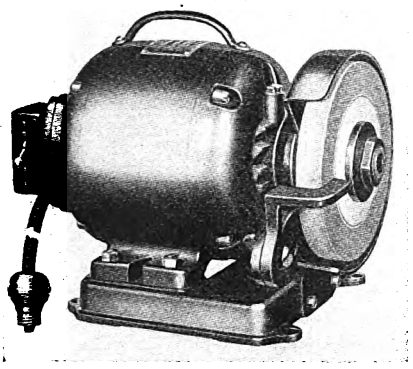
New Equipment Available

Grinder with Pulley for Driving Other Machines

DESIGNED for use in small shops where it is desirable to have the motor available for other work, a grinder has been announced by the Master Electric Company, Dayton, Ohio. The particular feature of the machine is a combination pulley and



Grinding motor with pulley so that it can be used for power drive

adapter for holding the grinding wheel, which fits on the motor shaft. The unit can thus be operated as a power motor by using the grooved pulley which is between the end of the motor frame and the grinding wheel.

New Types of Mazda Lamps for Car Lighting

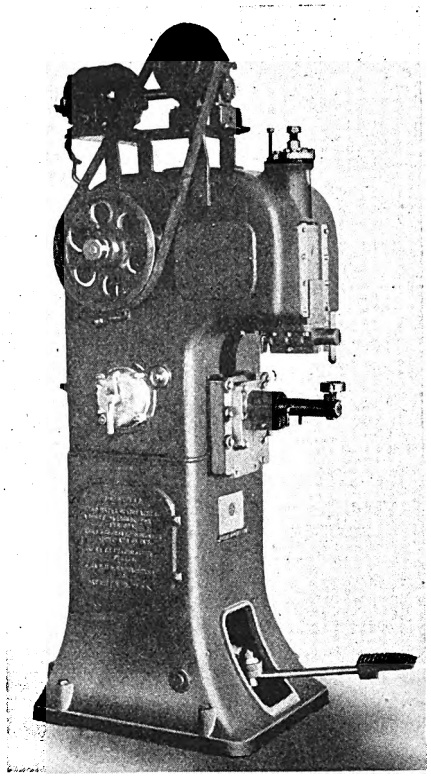
SINCE the standard line of inside frosted Mazda lamps for general lighting service was introduced about two years ago, electric railway operators have been interested in their availability for car lighting. This question was answered on Oct. 1 by the Mazda lamp manufacturers, who announced the standardization of a 36-watt A-21 inside frosted Mazda lamp for five-in-series operation. They also announced a 30-volt, 1-amp., A-19 and a 30-volt, 1.6 amp., A-21 Mazda lamp for twenty-in-series operation.

The engineering departments of lamp manufacturers have been engaged for a long time on the problem of developing lamps for electric railway service that would be most efficient and sufficiently rugged to withstand the severe service of car lighting. Many laboratory experiments have been conducted in developing various filament constructions, followed by extensive tests on the lamps in actual service. The results of these experiments have now been crystallized in the three new lamps just announced. The 36-watt, A-21 inside frosted lamp is designed at 105, 110, 115, 120, 125 and 130 volts for five-in-series operation and is adaptable to existing installations in cars as well as being interchangeable in circuits with the present 36-watt S-19 clear bulb lamps. No modification of the wiring or sockets is necessary.

The 30-volt lamp in the two current ratings is designed for operation twenty-in-series on 600 volts and, of course, requires a change in the wiring of existing cars as well as a special short circuiting type of socket, but these lamps are of the gas-filled type, more efficient and producing a better quality of light than the vacuum lamps for five-in-series operation. Many of the new cars are being equipped for them and several railways have rewired their older cars. In addition to the advantages of better efficiency and better quality of light, these lamps are equipped with an automatic self-contained short-circuiting device so that the failure of one of them does not extinguish the remainder of the series.

Combination Welder and Punch Press

COMBINATION of an automatic spot welder with a punch press in one machine is announced by the Gibb Welding Machines Company, Bay City, Mich. Spot welds are made in



New welding press

a fractional part of a second by means of an especially designed transformer and a precisely timed automatic switch. It is claimed that the rapid method of welding eliminates depressions in the surface, warping or discoloration, as the weld is made before heat has an opportunity to soften the outer surface of the material.

The welding press has a smooth toggle action which brings the welding point into contact lightly with the work, and a final closing pressure is applied. The machine is adapted particularly for attaching ears, clips or lugs to various metal parts.

Monthly Maintenance Contest Continues

MANUSCRIPTS are being received for entry in the maintenance men's contest for monthly prizes, subject to the following conditions:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
7. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York.
8. A prize of $25 will be awarded each month for the best maintenance idea in the group published. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until April 30, 1928.
9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the one containing the item.
10. Additional details were given in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

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Association Activities

Dorchester Extension Discussed by New England Club

Features of the new $12,000,000 rapid transit line is the topic of several papers at Boston meeting, the first of the season. Association president talks

THE first meeting for the season of the New England Street Railway Club was held at the Copley Plaza Hotel, Boston, on Oct. 27. President R. B. Stearns, vice-president Eastern Massachusetts Street Railway, presiding. The program was in charge of the Boston Elevated Railway, the first of a series of meetings to be planned, in turn, by several of the large electric railways in this territory.

E. L. Lockman, assistant to the superintendent of maintenance Boston Elevated Railway, read a carefully prepared paper on the general features of the Dorchester rapid-transit extension of the Boston Elevated Railway which is to be opened to the public on Saturday, Nov. 5. An abstract of Mr. Lockman's paper will appear in a future issue. He showed motion pictures especially taken for the occasion from a car traveling over the newly completed track. There were also construction motion pictures. Only the portion from Andrew Square to Fields Corner will be put in operation this year, he said. In answer to a question about the relation of the rapid-transit extension to existing and future facilities in the region, H. M. Steward, superintendent of maintenance Boston Elevated Railway, says that much business is going to come to this line from the southern part of the territory to be served. The previous steam railroad facilities in the region determined the routing. New bus lines will be installed as needed, but it is impossible to tell in advance just how the people will respond to the new facilities. The rapid-transit extension has resulted in a building up of the section and feeders to the rapid-transit lines will be added in accordance with the response of the patrons.

This improvement will eventually represent an investment of from $12,000,000 to $13,000,000. It will be possible to cover the distance from Park Street station to Fields Corner, about 5 miles, in fourteen minutes running time. There are no grade crossings on this extension.

Automatic Substations for the New Line

F. N. Carothers, general foreman of substations Boston Elevated Railway, treated the subject of automatic substations in an informal but effective manner, avoiding technical details as much as possible. He supplemented his paper by the showing of a General Electric motion picture film which gave the technical details in a manner easy to follow. An abstract will appear in a future issue.

Discussion on Mr. Carothers' paper brought out some sidelights on the mercury vapor converter substation, which was shown to be especially effective on systems having from 1,200 to 1,500-volt distribution. The experience of a number of railways which are using the new type of substation was cited and the impression given was that it is rapidly emerging from the experimental stage.

E. P. Locke, engineer car construction Boston Elevated Railway, read a paper on the new features of the cars for the Cambridge subway. Discussion on this paper largely centered on the use of floor material which will withstand wear but is easy to repair. There has been no trouble with slipping in connection with the duraflex which is used on the new cars. An abstract of this paper will be published later.

Mr. Stevens Speaks of Industry Trends

At the evening session, after dinner served at the Copley Plaza, several addresses were given. R. P. Stevens, president of the American Electric Railway Association, spoke on the trends in the electric railway industry, basing his remarks largely upon the briefs presented in the Charles A. Coffin Foundation competition. Supplementing his written address, he reiterated the idea that service is to be the keynote of his presidency of the association.

Give the People What They Want, Says Mr. Sullivan

Mr. Stevens was followed by Col. Thomas F. Sullivan, chairman Transit Commission of the city of Boston, who further emphasized the idea of giving the people what they want. He spoke of the excellent treatment which the local railways had received at the hands of the public and urged the giving of service so attractive as to meet the competition of the private automobile. He agreed with Mr. Stevens as to the necessity of controlling the parking evil, stating that the highways are for traffic and not for parking purposes. The streets represent too much investment to warrant their use for parking.

He referred to the coming opening of the Dorchester rapid-transit extension as far as Fields Corner, which is to occur at the end of the present week, and pointed out how beneficial this will be to one of the largest communities in metropolitan Boston. It is important he said, to get the merchants and others to realize how close the new rapid-transit facilities will bring Dorchester to the business district of Boston. Colonel Sullivan urged a prompt solution of a local traffic congestion problem at Governors Square, where the Boylston Street subway comes to the surface.

Value of Service Information Bureau Stressed

S. T. McQuarrie, who is in charge of the New England Bureau of Public Service Information, then spoke on the services which his bureau can render. He urged electric railway men to utilize the opportunity to speak before clubs, civic associations, etc. He said that elementary information is greatly appre-

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 8*—Wisconsin Motor Coach Association, annual convention, Hotel Whiting, Stevens Point, Wis.**

***Nov. 16-17*—Central Electric Traffic Association, Keenan Hotel, Fort Wayne, Ind.**

***Nov. 17-18*—American Society Mechanical Engineers, annual meeting, Engineering Societies Building, 29 West 39th Street, New York, N. Y.**

***Nov. 17-18*—Personnel Research Federation, Accident Reduction section, 40 West 40th Street, New York, N. Y.**

***Nov. 28-30*—American Institute of Electrical Engineers, regional convention, Drake Hotel, Chicago, Ill.**

***Dec. 1, 2*—Pennsylvania Street Railway Association, annual meeting, Scranton, Pa.**

***Dec. 2*—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York, N. Y.**

***Dec. 2*—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.**

***Jan. 16-17*—Midwest Electric Railway Association, Hot Springs, Ark.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Cincinnati, Ohio.**

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ciated by the public. The office of the committee is supplied with data which can be used by railway men in making such addresses.

The next speaker on the program was the Rev. Archibald G. Sinclair, D.D., pastor of the First Presbyterian Church, Bloomfield, N. J. His topic was "Some American Delusions." These delusions were:

1. The idea that bigness is the essential thing.
2. That individual effort can accomplish results in these days of teamwork.
3. The conception that a shallow optimism is a healthful sign.

He illustrated by means of humorous incidents the fundamental principles that quality counts rather than quantity, that individualism must be respected and that true optimism is based upon facing all of the facts.

The chairman announced that the next meeting of the club would be held under the auspices of the Connecticut Company at Hartford.

Wisconsin Bus Men to Meet

FOLLOWING an address of welcome by Mayor J. N. Welsby of Stevens Point and the reply by A. M. Schrum, Gray Transportation Company, president of the association, papers will be presented on "The Place of the Motor Bus in the Country's Transportation System," by Prof. H. R. Trumbower of the University of Wisconsin, and an illustrated talk on "Evolution of Transportation," by A. A. Engelhard, Milwaukee Electric Railway & Light Company.

In the afternoon there will be the report of the legislative committee, B. W. Arnold chairman, and the following papers:

"Procedure and Legal Aspects Under the Present Law," by Phil Porter, legal adviser Wisconsin Railroad Commission.

"Administration of the Motor Bus Law," by L. P. Atwood, director of bus transportation Wisconsin Railroad Commission.

"Safety and Accident Data," by C. M. Larson, chief engineer Wisconsin Railroad Commission.

"The National Situation," by G. P. McCallum, president Michigan Motor Bus Association.

Following the presentation of papers by the representatives of the Wisconsin Commission there will be a general discussion led by W. A. Jackson, vice-president Milwaukee Electric Railway & Light Company, and Glenn Stephens, attorney, Madison.

A question box will be conducted by Vice-President H. G. Monger of the Milwaukee Electric Railway & Light Company.

The annual dinner will be held in the main dining room of the hotel at 6:30 p.m. M. H. Frank of the Wisconsin Power & Light Company, Fond du Lac, will act as toastmaster and John Callahan of Milwaukee will be the speaker of the evening.

American Association News

"Aera" in New Form

PUBLICATION of the November issue of *Aera*, the official magazine of the American Electric Railway Association, begins the change in policy decided by the executive committee on recommendation of the committee on publications, of which J. H. Hanna is chairman.

The magazine in its new form is a 64-page book with covers, 7x10 in. in size. It carries no advertising.

"Under the new plan," states the leading editorial, "it is hoped that the particular function which the magazine performs, that of drawing closer together the association's far-flung membership, will be better accomplished by directing its pages to this primary objective. The magazine will give greater attention to keeping its readers posted on committee work, and to the interpretation of committee activity. It will endeavor to keep individual members more closely in touch with the work of the association, and will reflect more in its pages the activity of community and company sections and of geographical sectional associations to which new membership privileges are offered in the revised constitution just adopted at Cleveland."

John A. Miller, Jr., associate editor of ELECTRIC RAILWAY JOURNAL, has been appointed editor of *Aera* and will devote all the time necessary to it in order to get out a publication consistent with the needs of the association and the industry.

Next Convention to Have Exhibits

DECISION was reached on two important points at a meeting of the committee on convention location, held at association headquarters, New York, on Oct. 28. Opinion was practically unanimous that there should be exhibits at the next convention. While it may be desirable later to adopt a policy of having exhibits only in alternate years, it was thought that the industry is at present standing at the threshold of important developments and that it would be a great mistake to do without exhibits in 1928.

The date selected for opening the convention is Saturday, Sept. 22, with Friday, Sept. 28, as closing day. A number of reasons impelled the committee to select earlier dates than have been chosen in past years. If the convention is held in the new auditorium at Atlantic City, one of two locations now under consideration, it will be necessary to have all exhibits out several days prior to Oct. 8, when the convention of the American Gas Association opens there. It was thought also that dates during the latter part of September would be more convenient for the accountants, than dates in early October. Another reason for preferring the new time was to eliminate interference by the World's Series baseball games which have claimed the interest of some of the delegates at previous conventions.

It was found impracticable at this meeting to make a final selection of the place to hold the convention. While there was strong sentiment in favor of Atlantic City, considerable doubt existed concerning the completion of the auditorium building there by next fall, and the organization of a suitable operating staff to handle the complicated problems of a large convention. The possibility of labor difficulties, such as have occurred there in the past, was also considered. Some of the opinions expressed favored Cleveland as a location for the next convention. Final decision on this matter was reserved by the committee until a future meeting. Options until Jan. 1, 1928, were secured for both the Cleveland and the Atlantic City auditoriums.

Special Reports in Preparation

SPECIAL reports are being prepared by the Bureau of Information and Service of the American Electric Railway Association and will be available to member companies upon request, as follows:

Bulletin No. 168 — Charts Illustrating Recent Trends in Electric Railway Operations and Also Electric Railway Bus Operations. — A reproduction of a series of charts prepared for exhibition at the 1927 convention, showing trends of traffic, revenues and expenses, trends of fares and wages, growth of electric railway bus operations, distribution of bus operating expenses, bus depreciation rates in use, distribution and trend of cash fares, automobile registrations and their effect on passenger traffic, comparison of bus operating costs in 1926, 1925, etc., with an accompanying story on their significance.

Bulletin No. 169—Parking Restrictions.— Contains summaries of conditions in twenty American cities, showing the tendency during recent years toward relieving traffic congestion and speeding up street car traffic through the restriction, and in some cases the elimination, of parking in the congested centers. There is also included a section describing the establishment of public parking spaces by street railway companies.

Bulletin No. 170—Methods of Fare Collection.—Shows the various methods employed by 337 electric railway companies in collecting fares. In each case it shows whether fare collection is pay-as-you-enter, pay-as-you-leave, pay-as-you-pass, or collection-within-the-car (hand to hand), also shows the various types of registers or fare boxes in use.

Bulletin No. 171—Trend of Electric Railway Operations.—A comparative record of the revenues, expenses, taxes, car miles, revenue passengers, and operating ratio of a group of 134 companies for the first six months of 1925 compared with the first six months of 1924 and monthly thereafter, up through June, 1927. The group is also subdivided into separate similar statements for each of the geographical divisions of the country.

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News of the Industry

Appraising Co-operation in America

Results of profit-sharing plan in force in Philadelphia and Buffalo amaze English economist

A MONUMENT to T. E. Mitten's forceful personality and understanding of human ambitions and desires is the profit-sharing plan in force in Philadelphia, Pa., and Buffalo, N. Y., both guided by Mitten Management. Its success, really phenomenal, is ascribed to the philosophic conception of the plan itself. Such is the conviction of Bertram Austin, London, England, student of economics in many lands and co-author with W. Francis Lloyd of the much-discussed books "The Secret of High Wages" and "Capital for Labor." Mr. Austin sailed for home on Nov. 4 after visiting more than a month in this country at the invitation of Mr. Mitten.

At an interview with him at the Hotel Plaza, New York, on Nov. 3, Mr. Austin told a representative of the ELECTRIC RAILWAY JOURNAL how intensively he had studied the Mitten plan for employee ownership of industry as applied on the Philadelphia and the Buffalo transportation systems. Detaching himself from the management, he walked about among the rank and file and found the results incredible. To think that five years ago Buffalo traction was synonymous with seething warfare and that one of the present Philadelphia leaders in the men and management scheme was some few years ago inciting rebellion against the officers makes this ultra co-operation and this "I to I" movement all the more remarkable.

PARTICIPATION BY MEN IN MANAGEMENT

Nothing today, in his opinion, could disturb the amicable relations existing between the masters and men, as he termed it, which is exemplified on the Mitten properties. Here are men owning collectively $12,000,000 and selling $18,000,000 of Mitten stock to the public of Philadelphia—men who got 22 cents an hour at the inception of Mitten management and now get 73½ cents on a road whose gross earnings were $11,000,000 when Mr. Mitten took hold and now with the same number of employees have advanced to $50,000,000. These results Mr. Austin ascribed largely to the fact that Mr. Mitten developed a trade code which disregarded labor as a commodity and introduced on the railway system the laborer as a co-operator entitled to share in the profits.

Mr. Austin, though in favor of trade unions, sees no need for their functioning under the Mitten plan of operation. In the early days of labor strife he believed they served a useful purpose, but if the Mitten plan were to become general in industry he could see less need for the efforts of the labor unions.

It will be Mr. Austin's privilege to discuss the Mitten plan of profit sharing in England, preferably on the railway properties first. On the whole, profit sharing has been unsuccessful in England and to introduce the Mitten plan abroad is fraught with many difficulties. In the first place he believed that labor union members were more numerous in his country than in this country and were more loyal to their organizations. Again, political labor was very strong, so that collective ownership of capital in any wide sense in England would run counter to trade unions. However, he believed that his country had much to learn from ours and also that we could learn something from labor conditions abroad.

It was his conviction that the Mitten plan portended great things in industry in its practical demonstration in Philadelphia and Buffalo and that its application went a long way toward solving the eternal problem of capital and labor. At least the electric railway systems in these two cities bear testimony to the salutary results in the changed attitude of labor and capital from a fighting organization to a co-operative business.

Transit Should Be a Business Matter

New York City told that with new lines under construction, city is threatened with disruption or ruin of old lines and prospects of deficit that will cost hundreds of millions

UNSATISFACTORY transit service in New York City is due to increased operating costs incident to the war and to insufficient revenues, said Major Charles E. Smith, St. Louis transit expert, before the Merchants' Association at the Hotel Astor on Nov. 1. Major Smith recently completed an exhaustive investigation of transit facilities for the city.

He said fixed fares have always been, and will continue to be, disadvantageous. Fare should fluctuate with changing conditions and service be provided at not more than cost. Better service can be given for higher fares and subways in sufficiency can be provided for comfortable transit at a reasonable fare.

Insufficient revenues are responsible for the oversights in inspection and maintenance that cause the numerous delays. The city officials share equally with the company officials the responsibility for adequate and safe transit. Distrust of operating officials lowers the morale of employees and decreases the safety of passengers.

COMPANIES PERFORM EFFICIENTLY

According to Major Smith poor transit, traffic and transportation conditions are causing industry to grow faster in adjacent New Jersey than in New York City. Transit facilities and Americanization, not the 5-cent fare, are lowering the population in lower Manhattan. The same lowering is taking place in other large cities that have higher fares. The performance of the companies under the dual contracts is being administered efficiently by the Transit Commission.

The elevated and surface lines are not obsolete nor inherently losing ventures. Both increased their traffic about 50 per cent while the subway system has been developed and a further elevated increase of 50 per cent is anticipated. Their lack of profits is due to competition of the subsidized city-owned subways. They are justly entitled to increased fares. The old elevated railways must be tolerated until a great deal more money is available than is now in sight. In the meantime their revenues should permit them to give good service. Motor buses to handle all the surface traffic would number more than fifteen times the Fifth Avenue buses at an increased cost of many millions of dollars in fares. The traffic congestion would be serious.

Major Smith said that recapture of city-owned rapid transit lines would present complicated legal, operating and financial problems, and either disrupt present routes and require more fares to be paid or possibly increased fares on the company lines. The recaptured lines would handle 25 per cent of present traffic; the other 75 per cent handled by the company lines, including the surface lines, would present a more serious transportation problem than at present.

The independent city system of subways, now under construction, is much more expensive than necessary to give transit relief and some of the lines are premature. Costs are exceeding estimates by about 30 per cent. Enabling legislation should be secured for a commission to prepare a tax roll of benefits due to rapid transit construction by the city. A tax rate should be fixed on this roll each year to spread the cost equitably between car riders and benefited property owners; owners of property not benefited should be relieved of transit costs.

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The best solution of the problem requires the unification and consolidation of all transit facilities, including the new city subways, into one company, with a single fare over all rapid transit lines and transfers between them and surface lines on the most favorable basis. It is not necessary that a new company be formed, nor that any exchange of securities take place, nor that the present companies be merged.

A conference committee of the Board of Estimate and the Transit Commission should negotiate with the present companies for the joint operation of present systems and new subways under the dual contracts appropriately amended, earnings to be poled and fares to be fixed to cover not more than the cost of service, including the carrying charges on company and city investments not otherwise paid by benefit taxes.

Labor Plans to Test Interborough Injunction

Action on the offensive was taken by the Interborough Rapid Transit Company for the second time during the week ended Nov. 4 when on Nov. 3 it obtained an order from Supreme Court Justice Richard H. Mitchell directing Joseph G. Phelan and James H. Coleman, organizers of the Amalgamated Association, to appear on Nov. 11 to show cause why they should not be punished for contempt of court in violating an injunction restraining the officers and agents of the Consolidated Railroad Workers' Union, now defunct, from attempting to organize the Interborough employees.

The injunction was signed on Dec. 30, 1926, by Supreme Court Justice Delehanty and was upheld by the Appellate Division on June 25 last. The Amalgamated Association maintained that since it was not mentioned in the injunction papers the action did not lie against the association.

In support of the move to punish Phelan and Coleman for contempt the I. R. T. submitted to Justice Mitchell affidavits of a dozen employees of the Brotherhood of I. R. T. Employees, the so-called company union, and one signed by President Frank Hedley of the I. R. T. The affidavits alleged that representatives of the Amalgamated Association had made overtures to the railway men in an effort to unionize them.

In consequence of recent moves in connection with this matter prospects pointed on Nov. 4 to a test of this issue. Following the arrival of William D. Mahon, president of the Amalgamated Association of Street and Electric Railway Employees, in New York on Nov. 4 he announced that President William Green of the A. F. of L. would join him in fighting "to the bitter end" the movement characterized by him as an attempt of the Interborough Rapid Transit Company to obtain a sweeping injunction restraining the 3,000,000 members of the federation from communicating with the employees with the idea of inducing them to join the Amalgamated.

Franchise Matters in Omaha Still Unsettled

Conditions with respect to the franchise ordinance of the Omaha & Council Bluffs Street Railway under consideration by the City Council of Omaha, Neb., for some months appear chaotic as the result of the insistence by the politicians that the terms of a new grant shall include the acceptance by the company of things it is not willing to concede. It is true Mayor Dahlman has urged upon his colleagues a compromise that will be fair all around, but the desire seems to persist that a provision should be incorporated in the new grant that would permit the Council to amend the franchise any time during its 30-year life. This may possibly lead to the rejection of the grant on the part of the company, as the officials insist this would make the terms of the ordinance so indefinite that the bond issue soon to mature could not be renewed.

The present franchise expires on May 1 next and the bonds fall due on Jan. 1. The protective committee named by the bondholders is understood to favor dropping further franchise negotiations and relying upon the claim of a perpetual franchise put forward by the Guaranty Trust Company in a federal court suit brought on behalf of all bondholders.

Railway Issue to Go Before Toledo Voters Soon

For the first time in many years the railway problem in Toledo has been almost completely left out of the municipal campaign as an election issue. Only one candidate has said much about the matter and he is conceded to have small chance of election.

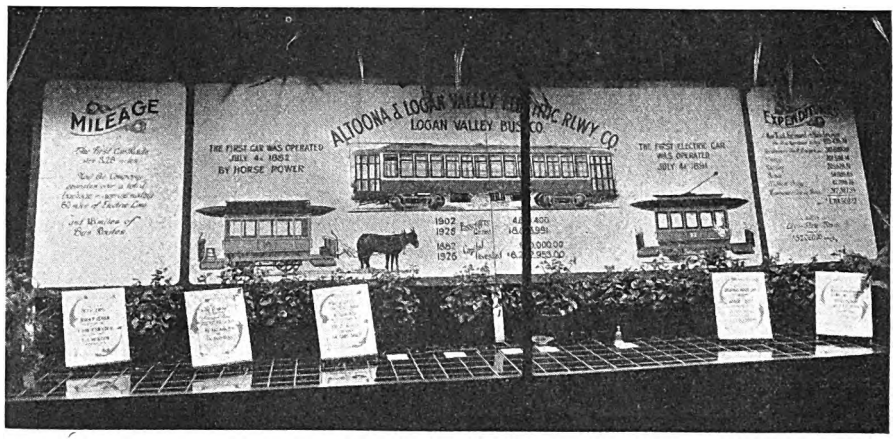
One reason for this is probably the fact that the Street Railway Board of Control and officials of the Community Traction Company and Henry L. Doherty & Company representatives have agreed on a basis for an amendment to the Milner ordinance so as to provide a unified bus and railway service with a new arrangement as to capital structure, with powers of the board of control changed and other features being worked into an ordinance which may be submitted at a special election at an early date. In fact, it is believed that the railway issue will be brought concretely before the voters in this new ordinance shortly after the election on Nov. 8.

A Good Stroke of Salesmanship

In participating in the Altoona "progress week" celebration, continuing for an entire week, the Altoona & Logan Valley Electric Railway featured with a display that traced the history of the railway from the horse-drawn days to the present time.

The "progress week" program was sponsored by the Altoona Chamber of Commerce and citizens' committee to "sell Altoona to Altoonans." Residents of the community, as well as visitors, were afforded first-hand information on what Altoona is, what the city has done and what the city industries do. More than 80 business firms participated, including the Pennsylvania Railroad.

The Altoona & Logan Valley Electric Railway used a display 30 ft. long, expert painters depicting the first horse-drawn car of July 4, 1882, the painting being from an original picture. There is still with the company one survivor of the horse-drawn days, Frank E. Gates, retired five years ago with a pension from the management.



Progress in Altoona reduced to the simplest terms

The first trolley, placed in operation on July 4, 1891, was shown. The center piece showed the present-day type of improved safety car. The fact was brought out that the horse-drawn car of 1882 weighed 1½ tons and cost, with the horse, $490; the electric car of 1891 weighed 5 tons, while the present-day car weighs 30 tons and cost $20,000.

The company mileage was given. The first car traveled a route of 3.25 miles. The present routes cover 60 miles for electric cars and 18 miles for buses. Company expenditures, passengers carried and capital invested were shown. Rail equipment also formed a part of the exhibit.

The display by the electric railway proved to be one of the most popular during the progress week celebration. It will be re-erected in the company offices as a permanent exhibit.

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Parking Matter Up Again

Plans discussed for six weeks no-parking experiment in downtown Chicago, as suggested in traffic study

PLANS to abolish use of Chicago's downtown streets as a garage are again taking shape as a result of the charge recently made by Alderman A. J. Homan that the City Council had delayed action for more than six months on the recommendations contained in the $50,000 traffic survey prepared last year by Miller McClintock of Harvard University for the Chicago Association of Commerce.

The McClintock report provided, among other things, for the abolition of all parking in the "Loop" district, the establishment of a uniform code of traffic regulation for the metropolitan area, for co-ordination of traffic lights and for a comprehensive safety program. It also advised limitation of parking in outlying business districts to 30 minutes and the prohibition of mid-block turns.

Except for the downtown anti-parking feature, the entire report was approved last December by a sub-committee, headed by Alderman Honan and was referred to the City Council. A "Greater Chicago Street Traffic Commission" was to have carried out the recommendations, but no meeting of this committee has ever been held.

Within the past few weeks, however, steps have been taken to bring about the no-parking ban on downtown streets. An ordinance designed for that purpose was recommended to the City Council on Oct. 12 by the sub-committee on traffic regulation and public safety. It was suggested by the committee that the plan be put into effect for a six weeks trial beginning on Nov. 15 and if successful should be permanently adopted. The ordinance would prohibit all parking in this area between the hours of 7 a.m. and 6:30 p.m. daily except Sunday. A six weeks experiment, the Aldermen pointed out, would definitely settle the problem involved.

"Mr. McClintock's report showed that only 2 per cent of the people entering the Loop park cars and the business men, I think, are for accommodating the greatest number who use other conveyances," declared Alderman T. J. Bowler, chairman of the sub-committee. During the Eucharistic Congress last summer, when the anti-parking rule was in force, he added, there was not a single automobile fatality.

There has been considerable opposition to the proposed law, but Alderman Bowler said he believed none would oppose the plan as an experiment. Mayor William H. Thompson and the traffic division of the police department have declared that the question should be decided by downtown business men. The police department maintains that it would be physically impossible to do away with parking altogether and that cab stands and other exceptions would completely counteract such benefits as would otherwise be realized.

The Traffic Commission also proposes to discuss a new set of uniform laws for Chicago which will conform in general outline with the Hoover Model Traffic Code. At the present time there are nineteen different sets of regulations, one set made by the city and the others by the eighteen park boards.

More Weekly Passes

Use of the unlimited-ride, transferable weekly pass is making progress in eastern Pennsylvania, as appears from the record of installations on properties associated with the Electric Bond & Share interests.

The first installation was made by the East Penn Electric Company May 25, 1925, at Pottsville, when a $1.25 pass supplemented the existing fares of 10 cents cash and three for 25 cents token. A $1.50 pass was also added on suburban routes charging 10 cents per zone.

A second installation was made at Williamsport on March 1, 1927, when the consolidation and rehabilitation of the local lines under the name of the Williamsport Railways was accompanied by a change from 5 cents to 8 cents cash, two tokens for 15 cents and $1.25 pass.

Another installation was made on June 27, 1927, by the Conestoga Traction Company, Lancaster, when a scale of 6 cents cash and 100 tickets for $5.25 was changed to 7 cents cash, four tickets for 25 cents and $1.10 weekly pass.

The fourth and fifth installations were made Oct. 10, 1927, on the Allentown-Bethlehem city lines of the Lehigh Valley Transit Company and the lines of the Easton Transit Company and the associated Phillipsburg Traction Company of New Jersey. In these cases the fare was changed from 7 cents cash to 8 cents cash, two tokens for 15 cents and $1.25 pass.

Five-Cent Zone Fare Suggested for Oakland

A basic 5-cent fare for the local lines of the Key System Traction Company, Oakland, Cal., with establishment of zones was urged on Nov. 2 by A. G. Mott, chief engineer of the California Railroad Commission, at a rate hearing in Oakland. This recommendation was submitted to Commissioner Clyde L. Seavey.

Key officials, who ask an early decision in the rate case, are opposed to the 5-cent proposal. They are urging a 10-cent basic transient rate with weekly passes to regular riders. The 10-cent proposal was submitted as an amendment to the Mott report. The present fare is 7 cents. It is claimed that this has been found inadequate. Odd coin fares, such as 6, 7 and 8-cent rates, are condemned as bad business in the Mott report, which further suggests "bargain" fares during off-peak hours to encourage patronage and offset private automobile competition. The report pointed out that electric railways prospered on the 5-cent fare before the war and that this prosperity has waned since establishment of 6, 7 and 8-cent fares.

Quality of service must be improved, Mr. Mott pointed out, in order to compete with the private automobile. Urging economies in operation, Mr. Mott advocated one-man operation of cars with fare collectors and loaders on the ground in congested areas. A yearly net saving of $218,000 by this plan was estimated.

Carelessness at Crossings Defined by the United States Supreme Court

IN A short but sweeping decision rendered on Oct. 31, the United States Supreme Court laid down a "standard of conduct" for persons driving upon railroad tracks at grade crossings which apparently puts responsibility for accidents upon them unless they have left the vehicle and looked down the track.

Dora Goodman, administratrix of the estate of Nathan Goodman, sued the Baltimore & Ohio Railroad for the death of Goodman at a grade crossing near Whitfield, Ohio. She recovered damages in the lower court and they were affirmed by the Circuit Court of Appeals. In a decision read by Justice Holmes, the Supreme Court reversed this finding and found for the railroad, which contended Goodman's death was due to his own negligence.

The trial testimony showed that Goodman, who was driving a truck, was familiar with the crossing and slowed down to a speed of 6 to 8 m.p.h. when he approached it. It was brought out that view of the track was cut off by a section house 243 ft. from the crossing and that Goodman was within 20 ft. of the crossing before he could have seen the train which caused his death.

In reversing the lower courts, the opinion of Justice Holmes says in part:

When a man goes upon a railroad track he knows that he goes to a place where he will be killed if a train comes upon him before he is clear of the track. He knows that he must stop for the train, not the train stop for him. In such circumstances it seems to us that if a driver cannot be sure otherwise whether a train is dangerously near he must stop and get out of his vehicle, although obviously he will not often be required to do more than to stop and look. It seems to us that if he relies upon not hearing the train or any signal and takes no further precautions he does so at his own risk.

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Ordinance for Philadelphia Line Rushed in Council

An important ordinance was advanced by the City Council of Philadelphia, Pa., from second to third reading on suspension of the rule on Oct. 27, providing for a single track railway on Hunting Park Avenue as part of the Erie Avenue route of the Philadelphia Rapid Transit Company, to be completed on Dec. 1. It was pushed forward at the suggestion of Charles B. Hall, president of Council, to meet a call for transportation in the section. The proposed line will form a link between the Frankford elevated and Broad Street subway. Operation of this route by the Philadelphia Rapid Transit Company will be governed by the terms of the 1907 agreement with the city, which runs until July 1, 1957.

Record Shipment Made by Union Traction of Indiana

Shipment of a carload of motors between Anderson, Ind., and Flint, Mich., recently illustrated the consideration that is being shown to patrons by the public carriers. The motors were shipped from the plant of the Delco-Remy Corporation at Anderson on a rush order to the Buick Motor Company at Flint. A representative of the Remy company called the Union Traction Company of Indiana at 11 a.m. on Sept. 28 and asked what was the best time possible on the shipment. A car was set at 2 p.m., left Anderson 4:37 p.m., Central Standard time, and was set for unloading at Flint at 7 a.m. Eastern Standard time the next morning.

Fare Compromise in San Antonio

The San Antonio Public Service Company, San Antonio, Tex., has effected a compromise with the city authorities in the matter of fare increase. Under the terms of the settlement, cash fares remain as announced under the recent increase, but the weekly tickets were reduced in price from 30 cents to 25 cents. Bus fares within the city limits were placed on a parity with railway fares, and outside the city limits the fare on either car or bus is to be 2 cents higher than within the city. The new rates also authorize the sale of coupon books good for 30 days, giving children under seventeen years of age 40 rides for $1.20 or twenty rides for 80 cents.

Several weeks ago the company announced an increase, which made the cash fare 10 cents on all car lines, against a former 6-cent fare. Provision was made for the sale of three metal tokens for 25 cents and for the sale at 30 cents each of tickets that enabled the holder to ride for a period of one week as often as he wished at the fare of 5 cents for each ride. Fare for children was raised from 3 cents to 5 cents straight. Bus fares remained unchanged, as they were already at 10 cents.

The compromise recently effected settles the matters between the company and the city which developed after the application of the former revised tariff.

Kansas City Employees Celebrate Reorganization Anniversary

Employees of the Kansas City Public Service Company, Kansas City, Mo., observed the first anniversary of the reorganization of the railway by a dinner and entertainment Oct. 18 at the Hotel Baltimore. The celebration, for the return of the management to private hands after a long period in receivership, was given under the auspices of the representation plan committeemen, the Employees' Brotherhood trustees and the directors of the employees' benefit unit. F. G. Buffe, vice-president in charge of operation; H. E. Green, president of the Employees' Brotherhood, and others made speeches.

Mail Box Attached to Cars in Miami Beach

The idea of installing mail boxes on street cars has been revived by the Miami Beach Electric Railway, Miami Beach, Fla. It is understood that the railway mail collection for the benefit of Miami Beach was put in force at the suggestion of Postmaster Pittman.

G. M. Dahl Vindicates Himself in B.-M. T. Affairs

Gerhard M. Dahl, chairman of the Brooklyn-Manhattan Transit Company, has filed an affidavit in the Supreme Court of New York County giving answers to certain questions put to him by Samuel Untermyer in the transit hearing last June. At that time Mr. Dahl refused to answer the questions. In his affidavit Mr. Dahl says that in the 90 days prior to June 8 the Brooklyn-Manhattan Transit Company sold 5,000 shares of Interborough stock and bought 2,000 shares. The greatest number of Interborough shares held by the Brooklyn-Manhattan Transit was 22,650 and the number held on June 8 was 19,650. The court did not require Mr. Dahl to go into all the details Mr. Untermyer sought when he first put his questions.

Switch Tender Blamed for Dade Park Accident

Ottis Lloyd, switch tender for the Evansville & Ohio Valley Railway, Evansville, Ind., has been held responsible in the report of the safety bureau of the Interstate Commerce Commission for the accident on Sept. 7 in which a car of the railway coming from the Dade Park race-track, near the city, plunged through an open switch, killing four and injuring more than 50 people.

Limited De Luxe Service Between Dallas and Waco

The Texas Electric Railway Dallas, Tex., has started a new de luxe passenger service on its line between Dallas and Waco. New and improved cars, known as the Blue Bonnet, operate as limited cars. Externally the cars are painted a brilliant blue and their name is derived from the Texas flower, the blue bonnet. The seats are upholstered in gray leather. They have double air cushions. The roadbed has been rebal-lasted and otherwise improved in preparation for this new fast service.

Mike Fewell, general passenger agent, announced that service will be expanded when additional cars can be provided.

Houston Fights Over Rate Differences

A fight has been under way in Houston, Tex., between the city and the Houston Electric Company for a cut in fares charged residents of Park Place, a suburb outside the city limits of Houston on the Galveston-Houston Electric Railway. That interurban line has been giving the residents of Park Place service at an 18-cent fare. The regular cash fare in Houston is 10 cents and residents of Park Place want that rate to apply to their district.

Public Service Commissioner C. J. Kirk has asked the company to grant a 10-cent fare to Park Place with transfer privilege, as on all city lines. Jeff L. Alexander, general manager of the Houston Electric Company, has countered with an offer of a compromise, in the reduction of fares from 18 cents to 15 cents with ten tokens for $1. The city attorney has held that under the city ordinance requiring the traction company to charge the same fares to all parts of the city, the Houston Electric Company can be compelled to build a line to Park Place and institute regular service on a basis of the same fares charged on the city lines.

"Big Parade" Interests Atlantans

A "progress parade" of street cars staged by the Georgia Power Company on Sept. 27 ushered in the new "sport model" equipment which is being delivered in Atlanta. It also marked the passing of the old type car from the streets of that city. "Old Timer," the last of the single-truck street cars in service on Atlanta streets, carried the Georgia Power Company's band at the head of the procession. In the line of March was one of the 40 new cars purchased in 1922 and 1923, one of the twenty cars purchased in 1925, one of the 100 new cars purchased in 1926 followed by a new interurban. A double-deck coach purchased in 1925 to supplement street car service was next in the procession, followed by one of the single-deck coaches. Car No. 860, the first of the 40 new "sport models" re-

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ceived in Atlanta, was next in line. It was followed by another car bearing a banner which said that 243 new cars had been purchased since 1921.

Express Service Under Consideration in Houston

The Houston Electric Company, Houston, Tex., under Stone & Webster ownership, is planning to establish express car service to West End and Houston Heights. It is said that the demand for express service to these outlying thickly populated districts of the city of Houston has become so insistent that it can no longer be ignored. A survey is under way to determine the amount of patronage that is likely to follow the installation of service of this kind.

All Set for Turkeys and Hams in Jacksonville

A safety contest closed in Jacksonville, Fla., early in September, indicating a new high mark for careful operation of cars by the trainmen in the employ of the Jacksonville Traction Company.

Records for the three months showed 153 operators out of nearly 220 who participated in the contest operated without a single chargeable accident, while 37 operators were held responsible for one accident each and nine for two each. Cash prizes totaling $1,142 were awarded the winners by the management.

Compensation in the next safety record will be by a turkey for the operator and a large ham for the winning conductor. This will mean a turkey for Christmas, as the period which began on Sept. 10 terminates on Dec. 18.

Toronto to Venerate Armistice Day

An outline of a suggested Memorial Service to be held on Armistice Day, Nov. 11, by the Toronto Transportation Commission, Toronto, Canada, has been despatched to every member of the organization. The plan is to have the veterans meet in front of the Parliament Buildings at 2 p.m. and march down University Avenue, place a wreath on the South African Memorial Monument, and then proceed to the Cenotaph, the monument to the fallen.

There will be no flag waving, no military uniforms at the exercises, but all united in one bond of veneration for the Toronto Transportation family, half of which served in arms the same cause with those whom the Cenotaph commemorates. The Toronto Concert Band will play from the steps in front of the City Hall when the marching veterans arrive. Hymns will be sung to the accompaniment of the band and short prayers will be recited. All friends and relatives of the Toronto Transportation employees are welcomed at the service.

Philadelphia Employees Eager to Absorb Information

More than 2,300 employees of the Philadelphia Rapid Transit Company, Philadelphia, Pa., are already enrolled in the various training and instruction courses provided by the company. The fall term of practical instruction opened during the week of Oct. 24, but applications for enrollment continue to pour into the training and educational division.

Courses are offered to employees on subjects which are directly applicable to their own jobs. Classroom groups will study stores methods, the gas-electric bus, blueprint reading, mathematics, fundamentals of electricity and public speaking. There is also to be a series of supervisory discussion groups, attendance at which will be limited to employees of supervisory rank, such as foremen, supervisors and sub-foremen. These groups will discuss the actual supervisory problems arising in the transportation, way, electrical and general office departments.

For those whose daily duties prohibit attendance at the evening classes, and for those who wish to retain the text material in printed form, a few subjects are offered in correspondence form. These courses include public relations, handling men, the electric railway industry and the ABC of the electric car. Any employee of the company may enroll for one of the correspondence courses at any time.

Classes are held in the evenings from 7:30 until 9:30 p.m. in the Mitten Building. Students are required to attend at least 70 per cent of the classes in order to obtain the engraved certificate signed by Dr. A. A. Mitten which signifies the successful completion of the course. Those enrolled in the correspondence courses must complete all of the lessons of the particular course to obtain this certificate.

Although the work of the training and educational division is in its infancy, its growth has been most rapid. The employees enrolled show astounding eagerness to absorb information which will broaden their viewpoint of their work and increase their efficiency.

Irresistible educational cartoon of Philadelphia Rapid Transit

Fare Hearing Resumed in Baltimore

Hearing of the application filed by the United Railways & Electric Company, Baltimore, asking for authority to charge a 10-cent fare was opened before the Public Service Commission on Oct. 27. The hearing is expected to continue for three or four weeks. The opening day was devoted to statements by counsel, the first being made by Charles Markell, counsel for the United. Thomas J. Tingley, people's counsel, spoke in opposition to the increase, as did Linwood L. Clark, representing the People's Corporation, which also is opposing the application by the company seeking an increase.

Charles D. Emmons, president of the United, was the first witness called. He said the rate of return in 1920 on the valuation of the company's property as fixed by the commission was 5.43 per cent. In 1921 it was 4.85; in 1922, 5.19; in 1923, 5.32; in 1924, 5.32; in 1925, 5.48; and in 1926, 5.52.

Recently the commission refused to grant the United a temporary emergency increase pending action on the application for a permanent 10-cent fare. The present fare is 8 cents straight or two tokens for 15 cents.

RAILWAY EXTOLLED FOR COURTEOUS ACTS.—An interesting missive was received at the offices of the Portland Electric Power Company, Portland, Ore., signed by 45 members of the Oregon Employment Institution for the Blind, expressing their appreciation to the railway for the thoughtful treatment extended by the motormen and conductors, especially on the Montavilla-Hoyt and Montavilla-Stark cars patronized by the members of the institution.

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Recent Bus Developments

Seattle Terminal Opened Amid Great Fanfare

With speeches, music, luncheon and a parade, the new $200,000 terminal of the Pacific Northwest Traction Company in Seattle, Wash., was dedicated recently. It was opened as the central station for transportation lines, traction and motor, reaching all of the important centers of the Pacific Northwest and British Columbia. During the afternoon the building was open for public inspection.

A. W. Leonard, president of the Puget Sound Power & Light Company and also of the Pacific Northwest Traction Company, accepted the structure from the Stone & Webster Engineering Corporation, builder, and represented by W. D. Shannon, chief engineer. Mayor Bertha K. Landes, on behalf of the city, and C. Rea Moore, Olympia, supervisor of public utilities, on behalf of the state, congratulated the company and the public on the new transportation service the terminal afforded.

After the ceremonies, Mr. Leonard assisted Mayor Landes into an Everett interurban coach, and with Mr. Leonard at the controller and the Mayor at the bell rope they drove the first car from the new terminal.

The structure, which has an exterior of brick and cast stone, with a variegated roof, occupies a half block of land on Stewart Street. An arcade goes the entire length of the building from east to west, and at the west end of the building are shops, a restaurant and bootblack stand, commodious waiting rooms, together with ticket offices, information desk, public telephone booths and news-stands. In the northeast corner of the property a large space is reserved for emergency repairs to the stages that make the building the Seattle terminal. The interurban cars will enter the property from Ninth Avenue, load and discharge their passengers under a steel train shed and then continue through the property to Eighth Avenue and thence to Stewart Street. The east end of the building houses a baggage and express room and parcel checking stand. The entire structure is of mill construction, with firewalls of masonry and fireproof stair wells. Large marquees on Stewart Street and Eighth Avenue provide suitable loading spaces for both trains and stages. It is planned to decorate the grounds about the buildings with lawns, flowers and vines.

Bertha K. Landes, Mayor of Seattle, Wash., acting as conductor and President Leonard of the Puget Sound Power & Light Company acting as motorman of the first interurban car to leave Seattle's new car and coach terminal

Among the companies which have already leased quarters in the terminal are: Des Moines Auto Company, Haller Lake Transportation Company, Index Stages, Inc., North Coast Lines, Portland-Seattle Stage Company, Pacific Stages, Ltd., Puget Sound Motor Coach Company, Seattle Motor Coach Company, Shield Transportation Company, Pacific Northeast Traction Company, Wolverton Auto Bus Company and Yost Auto Company.

Interurban and stage terminal of Pacific Northwest Traction Company at Seattle, Wash., just completed at a cost of $200,000

Bus Successor to Railway in Huntington

A certificate to the Huntington Coach Corporation, Huntington, L. I., to operate a bus line between Halesite and Huntington station was granted by the Public Service Commission on Oct. 27. This company will provide transportation facilities in territory now served by the Huntington Traction Company, which, it is stated, is going out of business. The bus corporation will be owned and managed by the present owners of the railway.

Bus Service Between Dallas and Love Field

The Dallas Railway & Terminal Company, Dallas, Tex., has established bus service between Dallas and Love Field, the city airport for Dallas. During the hours of light traffic two buses are kept in operation, maintaining a 30-minute schedule. During rush hours a third bus is put in operation and a twenty-minute schedule is maintained. A 10-cent fare is charged.

Bus Succeeds Rail Line in Massachusetts

The Shelburne Falls & Collrain Street Railway, Shelburne Falls, Mass., ceased operation Oct. 29. This action followed the transfer by the Griswoldville Manufacturing Company's mill of its freight to its own bus service. The road has been in operation since 1896. It was 7 miles long. An independent bus line has succeeded to the business.

Service Started in High Point

The North Carolina Public Service Company started bus service in the city of High Point, N. C., on Oct. 9, with five new six-cylinder street car type Dodge buses. Bus service at High Point was formerly furnished by Chester Hawkins. The Hawkins lines withdrew from the city at the close of business on Oct. 8. J. H. Jennings is manager of the High Point branch.

Cleveland Park Line in Operation

A new coach line service, operated by the Capital Traction Company, Washington, D. C., between Cleveland Park and downtown Washington, was started on Nov. 1 under a twenty-minute headway. The fare is 25 cents with no standing passengers. Transfer privileges are permitted. Under the commission's order this service is to be operated for a trial period of six months.

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Financial and Corporate

Bridge Line Offers to Sell

The Manhattan Bridge Three-Cent Line has offered to sell its equipment and surrender its franchise to the city of New York. The acceptance by the city has been recommended by Borough President James J. Byrne of Brooklyn. The price asked by the company is $184,000 with $25,000 for salvage rights for equipment. If the offer is accepted, it is proposed to use the space now occupied by the tracks for an additional vehicular roadway. Albert Goldman, Commissioner of Plant and Structures, has estimated that it would cost the city $9,000,000 to construct another roadway on Manhattan Bridge. Elimination of the surface line would permit alteration of the track space for use as a roadway at an estimated cost of about $600,000.

Mr. Byrne expressed the belief that buses could be substituted satisfactorily for the surface cars on Manhattan Bridge. The railway is operated at a 3-cent fare over the Manhattan Bridge from the junction of Flatbush Avenue and Fulton Street, Brooklyn, into the Borough of Manhattan to the terminus of the bridge there. The total length of the route is about 1½ miles.

Name for Successor Company to Boston & Worcester Approved

The Massachusetts Department of Public Utilities has approved the corporate name of the Boston, Worcester & New York Street Railway, on the petition of Henry B. Rising, purchaser of the Boston & Worcester Street Railway. The new company is now in process of organization for the purpose of operating the Boston & Worcester Street Railway, recently sold to the petitioner at receivers' sale by order of the court. Opposition by the bondholders to the proposed issuance of bonds totaling more than $1,000,000 and preferred and common stock of more than $1,250,000 by the new company has been registered before the department.

Receivership in Evansville

William A. Carson, vice-president of the Evansville & Ohio Valley Railway, operating from Evansville to Mount Vernon, Ind., Grandview, Ind., and Henderson, Ky., has been appointed receiver for the company by Judge Elmer Q. Lockyear of the Vanderburgh County Probate Court. He immediately posted a $5,000 bond required by the court. G. R. Millican, manager of the company, will continue in that capacity for the receiver.

Friendly receivership proceedings were brought against the company by Greene & Greene, an insurance company, in a suit in which it was charged that the company was insolvent and that it had not paid insurance premiums of $111 due. Mr. Carson was authorized to continue operation of the company under the direction of the court. The receivership was forced upon the company, it is understood, through low earnings over a period of years, due to the inroads into its business by the automobile and because of claims filed and damage suits pending and contemplated.

Bond Application Renewed by Brooklyn Company

It is understood that the application of the New York Rapid Transit Company, operating subsidiary of the Brooklyn-Manhattan Transit Corporation, for the right to issue $17,000,000 in 6 per cent refunding mortgage bonds for the purchase of new equipment will be granted by the Transit Commission. Commissioner Charles C. Lockwood held a hearing on the application on Oct. 28. The company first proposed to sell an issue of $20,000,000 of 5 per cent bonds to the B.-M. T. for $16,000,000. This application by the company was rejected by the commission.

Larger Net for Third Avenue Railway

Amount increased by more than $225,000. Very interesting review of affairs of company for year ended June 30, 1927, by President Huff

FOR the fiscal year ended June 30, 1927, the operating revenue of the Third Avenue Railway System, New York, was $15,332,549, an increase of $665,551, or 4.54 per cent, compared with the fiscal year ended June 30, 1926. Operating expenses were $11,494,147, an increase of $391,627, or 3.53 per cent.

The year was an eventful one for the companies in the system. A strike on the lines of the Interborough Rapid Transit Company on July 6, 1926, resulted in the diversion of a substantial amount of traffic from the subway and elevated lines of that company to the Third Avenue lines, with an abnormal showing in receipts, and to some extent an abnormal showing in net earnings. In April, 1927, there was a general increase of 5 per cent in wages on transportation lines in New York City. This increase is reflected in the operating expenses of the Third Avenue system for the last few months of the year.

During the year it was necessary to pay paving bills of previous years that had been in litigation. These amounted to about $300,000. It also became necessary to expend about $350,000 on account of capital, with the result that the actual cash surplus of the companies of the system was approximately the same as the year previous; that is, about $1,500,000. This was felt to be none too large for the needs of the railway companies of the system. S. W. Huff, president of the company, says that under the circumstances the directors felt they were not justified in increasing the 2½ per cent interest which had been paid on the 5 per cent adjustment bonds during the previous year.

Mr. Huff says the extraordinary expenditures necessary and the increase in wages prevented the financial showing, and particularly the accumulation of cash, that had been anticipated, but that the year was an eventful one in clearing up some of the uncertainty that has surrounded the operation of the companies of the system. In his review of the affairs of the company the president says:

For several years the matter of threatened bus competition has loomed large on the horizon of these companies and created some uncertainty as to their future growth. In Westchester County generally they were threatened with competition from a bus system centering in the county seat, that would seriously interfere with the future growth and development of the electric lines of the system operating in that county. The Third Avenue Railway has for a great many years carried the deficits from operation of these Westchester lines with the hope that they would, by their natural growth, ultimately provide the means for substantial increase in earnings. To have them throttled now by bus competition would mean not only to cut off this prospect of future growth and increased earnings, but would mean the loss of the advances that have been made to them during the past years.

In the city of Yonkers the situation was even more acute. The city authorities granted bus franchises to a competing company, by which they authorized the operation of buses in direct competition with practically all of our electric car lines in that city.

In the Bronx a situation very similar to that in Westchester County had developed, except that the Bronx was vastly more important, because of the extent and importance of the car lines being operated in that borough. There are three electric railways operating in the Bronx, all component parts of the Third Avenue Railway System—Union Railway of New York, New York City Interborough Railway and the Southern Boulevard Railroad. These three companies have been operated with a universal 5-cent fare and a universal free transfer throughout the entire territory of the Bronx. The Bronx is the only borough in the Greater City that has a universal 5-cent fare and free universal transfers throughout its entire territory. This has greatly stimulated street car travel, and this travel in the Bronx has shown greater increases than in any other borough.

There were populous sections in the Bronx requiring public transportation. The Third Avenue Railway, under the terms of the adjustment mortgage, was unable to

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extend its lines into this territory. Bus lines, operated without legal authority, have sprung up to meet this need, until between $2,500 and $3,000 a day is being collected by these individual independent and illegal operators.

Bus Situation Reviewed

The city of New York mapped out a plan of bus operation which would include routes covered by the bus lines already in operation and others that were necessary or desirable. A well-organized bus operation in this territory might well prove a very serious obstacle to the growth and development of travel on the electric railways and to their earning capacity. These railway lines, like those in Westchester County, had been carried for a number of years during the period of development and growth, by advances from the Third Avenue Railway, although at the present time they are carrying themselves and contributing to the surplus of the system. As you were advised in a previous report, a bus company of the Third Avenue Railway System was an applicant for these franchises.

In Manhattan, also, the city authorities mapped out a bus system containing several routes that would offer serious competition with the electric car lines of this system. This is the situation with which your directors were confronted until comparatively recently. The situation has now been materially changed. Subsidiaries of companies of this system are now operating practically all bus lines out of White Plains, in the territory contiguous to our railway lines.

In Yonkers, of the fifteen bus lines for which the city authorities granted franchises, five did not compete with the lines of the Yonkers Railway, and were not contested. The remaining ten lines were contested before the Public Service Commission when the owners of the franchises came before that body for a certificate of convenience and necessity. The commission granted certificates of convenience and necessity for only two of the ten lines. It is not believed that the lines upon which the certificates of convenience and necessity were granted can be made to sustain themselves. The railway system is left for the most part free to serve the territory for which it was built.

In the Bronx, a franchise for all of the proposed bus lines was granted to the Surface Transportation Corporation of New York, one of the companies of the Third Avenue Railway. These bus lines in the Bronx to a very large extent open up new territory, feeding subway lines and the surface car lines of this system. They should, therefore, when operated in conjunction with our street railway lines, supplement rather than compete with the electric car lines in the Bronx. This bus operation in the Bronx will involve the purchase of about 100 buses. This purchase has been financed on 5 per cent equipment certificates.

Situation Clarified for Third Avenue Company

In Manhattan the plans for bus operation were modified and franchises granted only for crosstown lines. These do not offer any serious competition with the electric lines of this system.

From this it will be seen that the bus situation as affecting the companies of the Third Avenue Railway System has been very much clarified and the outlook for the growth of the companies of the system is better than it has been at any time since buses have become a menace throughout the country to electric railway growth.

CONSOLIDATED STATEMENT OF INCOME OF THIRD AVENUE RAILWAY AND CONTROLLED COMPANIES

Years Ended June 30

	1927	1926
Operating Revenue:		
Transportation	$14,858,299	$14,222,084
Advertising	150,000	150,000
Rent of tracks and terminals	23,448	24,399
Rent of buildings and other property	230,633	208,102
Rent of equipment	58,482	50,152
Sale of power	11,686	12,259
Total operating revenue	$15,332,549	$14,666,998
Operating Expenses:		
Maintenance of way and structures	$2,085,564	$2,256,726
Maintenance of equipment	1,416,736	1,699,862
Depreciation accruals	210,305	*399,753
Power supply	928,374	917,503
Operation of cars	5,029,683	4,872,190
Injuries to persons and property—Expended	1,183,028	1,174,784
Injuries to persons and property—Reserved	.....	*31,903
General and miscellaneous expenses	640,453	613,108
Total operating expenses	$11,494,146	$11,102,519
Net operating revenue	$3,838,402	$3,564,478
Taxes	988,460	1,036,624
Operating income	2,849,942	2,527,854
Interest revenue	222,713	197,434
Gross income	$3,072,655	$2,725,288
Deductions from Gross Income:		
Interest on first mortgage bonds	$513,080	$513,080
Interest on first refunding mortgage bonds	879,620	879,620
Interest onadjustment mortgage bonds	1,126,800	1,126,800
Track and terminal privileges	19,041	18,942
Miscellaneous rent deductions	8,747	8,499
Amortization of debt discount and expense	24,298	22,451
Amortization of limited franchises	8,270	7,469
Sinking fund accruals	33,480	33,480
Bus operation—net loss	34,153	16,783
Miscellaneous	148,347	60,268
Total deductions	$2,795,840	$2,687,395
Net income	$276,815	37,893

* Deficit.

We still have with us, however, the unjust paving tax, which has been removed to a very large extent in many states, but which has not been repealed in New York State. Its exactions bear heavily upon all street railroads. In the case of the companies of the Third Avenue Railway System, it amounts to more than $750,000 a year. This law is a relic of horse car days. But now it has become an unjust tax, and it is hoped that holders of electric railway securities everywhere will bring the injustice of this law to the attention of our legislators, with the hope that we may be relieved of this unfair burden.

Additional Defendants in Indiana Receivership Case

Trustees for the bondholders under various mortgages executed by the Union Traction Company of Indiana, Anderson, Ind., have been made additional defendants in the receivership case of the company in the Madison Circuit Court. A petition to that effect has been filed by the Westinghouse Electric & Manufacturing Company, plaintiff in the receivership suit. The amended complaint will bring into court all defendants having claims to determine preference among creditors. Carl F. Morrow, judge of the court, fixed Dec. 10 for a hearing.

Another Merger Plan

Suggestion made that District of Columbia lines be combined in $52,700,000 concern with 7 per cent return

HARLEY P. WILSON on Oct. 31 officially submitted to the Public Utilities Commission of the District of Columbia his plan for a merger of local transportation systems, proposing organization under congressional charter of a new corporation to take over the railway properties of the Washington Railway & Electric Company and all the properties of the Capital Traction Company and the Washington Rapid Transit Company. John W. Childress, chairman of the commission, said:

The statement of Mr. Wilson's plan has been materially changed since it first was handed to me. This is a much less definite statement than the one first submitted. It will not be possible to hold public hearings on it until many more details have been supplied and definite proposals are advanced for discussion.

John H. Hanna, president of the Capital Traction Company, said he had discussed the plan with Mr. Wilson, but that he was not prepared to talk about the matter for publication. William F. Ham, president of the Washington Railway & Electric Company, was absent from the city.

The plan was outlined in a communication signed by Mr. Wilson and addressed to Mr. Childress. Outstanding among the features more or less fully set forth were the following:

Capitalization of the two railways is to be reduced by agreement from an estimated $62,500,000 to $50,000,000, which sum represents approximately, although not so stated in the Wilson letter, the outstanding stocks and bonds of the two concerns.

Added to this capital there is to be $1,700,000 in cash put in by the new company with which to finance relocation of some tracks and other betterments and $1,000,000, also in cash, for a car-fare adjustment fund. Thus the capitalization at which the merger will be started is to total $52,700,000, on which 7 per cent will have to be earned to constitute a reasonable rate of return.

Whereas the two railways and the bus company together earned less than $2,000,000 last year, they are to be guaranteed fares that will earn them $3,689,000 a year. Mr. Wilson expressed the opinion that this 85 per cent increase of net revenue would not necessitate an increase of fares. He suggests that there be no deviation from present fares during the first year of the unified operation.

The Public Utilities Commission is to have no jurisdiction over the new company or over any railway or local bus operation after the merger. Regulation is to be by three trustees paid by the company out of operating income and appointed by the District Commissioners.

The Potomac Electric Power Company is to be omitted from the merger, but is to enter a long-term contract to furnish power and lease certain equipment to the new company at rates less than present cost to the two railways.

Respective valuations of the properties are not to be used as the basis of division of profit. This basis is to be the respective earnings of the two companies for a typical year to be agreed upon. This basis would

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give the Capital Traction Company slightly more than half the profits, whereas Mr. Wilson's estimate of valuations places the Washington Railway & Electric Company's worth at about $10,000,000 more than that of Capital Traction Company, as determined and to be determined by the courts.

No details are stated as to how stock of the new company shall be traded for stock of the present companies, or how the separation of the Potomac Electric Power Company from the Washington Electric & Railway Company is to be effected. But it is stated that the new company shall assume the funded debts of the two old companies.

The $1,000,000 fare adjustment cash fund is to be used to make up annual deficits, if any, in revenue, to be reimbursed later from subsequent earnings. Not only is the fund to be charged against capital account at the beginning, but all sums paid into it to replace withdrawals are also to be charged to capital account.

There is a suggestion in the Wilson letter that, under certain circumstances, deficiencies in earnings shall be "advanced temporarily by the city."

One Cent Out of Ten for Taxes

Economist of American Electric Railway Association makes forceful case for tax reduction before ways and means committee in Washington

ADDING to the testimony of numerous other representatives of business and industry in behalf of tax reduction, particularly a cut in the corporation income tax rate, before the ways and means committee in Washington on Nov. 1, Carl D. Jackson, general counsel of the National Electric Light Association and the American Gas Association, and Leslie Vickers, economist of the American Electric Railway Association, told the committeemen that lower taxes would benefit public utilities.

A tax reduction would be reflected ultimately in rates to the consumers, Mr. Jackson said, as regulatory bodies take taxes into account, the utilities acting more in the nature of collecting agencies for taxes paid by the consumers. A reduction in rates due to lowered taxes would mean more consumers and thus directly help the utilities, he asserted.

Mr. Vickers said that electric railways pay, in all forms of taxation, one and three-fourths as much as they distribute to their stockholders in dividends. Tax relief would make it possible for many of the electric roads to be revivified and to render better service. He said in part:

We are bearing a burden of taxation which is staggering in its weight. Its effect is not only to hamper us financially and to discourage the investment of new capital, but to impair those services which the public has a right to expect from us. Many of the electric railways of today could be revivified and restored if we could find relief from the oppressive burden of taxes which we bear. We ask for tax relief in the interests of service.

The taxes of the federal and local governments, including special assessments, but not such items as paving, comprise an estimated total of $65,000,000. The revenue of the industry for service it renders the public is approximately $936,000,000, so that for every dollar obtained as revenue 7 cents is contributed to government in the form of taxes. In addition to this we pay out a further 2 to 3 per cent of our gross revenue in paving and other charges, making a payment of approximately 10 per cent of our gross or a contribution to the state and federal governments of about 1 cent out of every 10 cents we collect. The tax item itself amounts to about half of all interest payments and is more than one and three-quarter times the amount paid out in dividends on preferred and common shares. The effect of such a substantial tax burden is to render more difficult the supply of public service and to affect profoundly the credit position of the industry.

In any industry, subject to regulation and operating under limited and reasonable rates, the burden of taxation in the last analysis rests upon the public utilizing that service. But there is a practical limit to the extent to which the public service company can act as collecting agent. A limit such as this is reached when cash requirements for taxes regularly assume so large a proportion of the net income of the corporation. Electric railways are local in character and scope of operation and accordingly relatively large taxes are already imposed by local governments. The federal income tax is a load added to an already overburdened industry and constitutes one of the most important examples of the adverse effect of the federal corporation tax on business development.

Our industry has passed through a revolution of the most serious nature. The present popularity of the private automobile could not have been predicted a generation ago, nor could have any one have suspected that the monopoly of urban transportation which we enjoyed could so easily be lost to us. But the fact is that today we are competing with private automobiles, not only for passengers, but for street space in which to operate.

Our industry is now emerging from a period as difficult as any industry has ever experienced. The essential nature of our services has been proved in community after community where attempts have been made to supplant them. We need tax relief, not only that we may supply the services now called for, but in order that we may continue to be in the future, as we have been in the past, the providers of efficient local transportation which builds up cities.

Goshen Abandonment Hearing Held

Harvey Harman of the Public Service Commission of Indiana held a public hearing recently on the Chicago, South Bend & Northern Indiana Railway's petition to discontinue city service in Goshen. Evidence taken in the hearing will be considered by the board and a final decision given later. Attorneys for both sides were given fourteen days in which to file additional evidence. The city protested the removal of the cars. R. R. Smith, receiver for the company, testified that it would cost $150,000 to place the line in first-class condition.

Traffic, Fare and Wage Figures

Further decrease is noted in the number of passengers carried by electric railways during the month of September, 1927, compared with September, 1926. The number of revenue passengers, including bus passengers, reported by 198 companies for the month of September, 1927, compared with September, 1926, is as follows:

September, 1927	739,275,475
September, 1926	754,012,025
Decrease, per cent	1.96

Owing to the fact that a new and completely revised Fare Bulletin, issued Oct. 1, showed that there were several changes from the cash fares as reported in former supplements of the old Fare Bulletin, compiled in September, 1925, the trend of cash fares in 272 cities of 25,000 population and over shown each month from Dec. 31, 1917, to date, has been slightly adjusted beginning with Nov. 1, 1921. On the new and revised basis the average cash fare in cities of 25,000 population and over is reported as follows:

Oct. 1, 1927	7.9700
Sept. 1, 1927	7.9700
Oct. 1, 1926	7.7387

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate, Cents	Index Number 1913—100 Per Cent
Oct. 1, 1927	57.26	210.13
Sept. 1, 1927	57.26	210.13
Oct. 1, 1926	56.87	208.70

Morris Traction Company Sold for $290,000

The properties of the Morris County Traction Company, Morristown, N. J., was sold on Oct. 31 at receivers' sale to George Hamm, of Pittsburgh, Pa., representing the bondholders' committee, for $290,000. Immediately after the sale it was announced that the property would be assigned to the Public Service Transportation Company, subsidiary of the Public Service Railway, which would replace the electric railway cars with buses.

Of the $290,000 paid, $280,000 was for property in Morris County and $10,000 in Union County. The sales were conducted in Morristown and Elizabeth by former Judge John F. Lynch, as special master in chancery.

The bondholders' interest in the company amounted to about $3,900,000, and organization of the committee, which represented 88 per cent of the holders,

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was for the purpose of salvaging as much as possible in the interest of the holders of the Morris County Traction Company's mortgage obligations.

The sales are subject to the approval of Federal courts.

Dismantling Schomberg & Aurora Line Planned

The Toronto Transportation Commission plans to dismantle the track and structures of the Schomberg & Aurora Railway, operation of which was discontinued on June 20, 1927. The Schomberg radial line ran a distance of 14.4 miles through country somewhat poor. It was the claim of the commission that the Schomberg radial was a losing proposition.

Coal Belt Electric to Be Acquired by Missouri Pacific

The Interstate Commerce Commission has authorized the Missouri Pacific to acquire the Coal Belt Electric Company, which operates an interurban electric line between Marion and Hafer, Ill., a distance of 13.46 miles. The interurban line has termini at Carterville, Herrin and Marion, Ill., and connects with the Missouri Pacific Railroad near Marion

The Missouri Pacific owns the outstanding stock of the interurban line and no new securities are to be issued in connection with the deal. In consideration for the conveyance of the property the Missouri Pacific Railroad has pledged itself to assume all unliquidated obligations of the Coal Belt Electric Company.

Legal Notes

CALIFORNIA—*Great Care Must Be Used in Operating a Car Without Lights at Night.*

An interurban car whose trolley had left the wire at night collided with an automobile. The court held that "such timely warning of the approach of a street car must be given as to enable others to avoid any danger from it," and neglect to give such warning, as by the absence of lights, was not the exercise of due care. In the same decision, the operation of the automobile of the plaintiff, while it was curtained at the side with isinglass rain covered curtains, was held not to be contributory negligence. [Cochran vs. Brown et al., 258 P., 1000.]

FEDERAL DISTRICT COURT—*To Be Engaged in "Interstate Commerce" Vehicles Must Regularly Transport Passengers or Goods Interstate.*

A company operated buses between two cities in Rhode Island but on part of the route ran for a short distance in Massachusetts and carried occasional interstate passengers. This was claimed to make the carrier interstate and so not under the jurisdiction of the Rhode Island authorities. The court held that an "interstate carrier" must run vehicles which transport passengers or goods interstate or honestly intend to do so. An occasional interstate passenger does not change the status. [Intercity Coach Co. vs. Atwood, 21 F. (2d), 83.]

MINNESOTA — *Paving Requirements Limited Under Franchise.*

A franchise secured in 1881 declared in one section that the company, if using other than animal power, should be required to pay only so much of the expense of street paving as was made extra by reason of the presence of its tracks on the street. Another section of the franchise declared that the company should keep the paving between its rails in proper repair. These sections were construed to mean that when new paving was laid the company could be charged only with the extra cost resulting from the presence of its track and that "proper repair" did not mean repaving. It meant only the restoration of existing paving to a sound or good state after decay, injury, dilapidation or partial destruction. [City of Duluth vs. Duluth Street Railway, 215 N. W., 69.]

MISSOURI—*Care Required When Car Operates on Left-Hand Track.*

An electric car was running for a short distance on the left hand track because of a traffic emergency and ran into an automobile whose driver was attempting to make a left hand turn. The plaintiff admitted he saw the car but believing it going in the other direction did not observe it as closely as he otherwise would have done. He was held not guilty of contributory negligence as a matter of law. [Wheaton vs. Wells, 296 S. W., 1031.]

NEW MEXICO—*Collection of Cost of Street Paving Made First Lien on Railway Property.*

A railway whose franchise required it to do a certain amount of paving issued mortgage bonds which were a first lien on the property. Some years subsequently the State Legislature passed an act making city assessments for paving superior to any other lien on street railways, except state, county and municipal taxes. The application of this act to the railroad in question was upheld. [City of Albuquerque vs. City Electric Co., 258 P., 574.

OHIO — *Instructions on Speed Considered.*

In a case charging negligence, where a municipal ordinance prohibited a greater speed than 15 miles an hour for a street car, it was error for the Trial Court to refuse an instruction that such a speed was in violation of the ordinance where the ordinance was valid even though under the law of Michigan the violation of a city ordinance as to speed is not negligence *per se.* Another requested instruction that the driver of a motor truck, unless he has actual knowledge to the contrary, has a right to assume that the electric car would be moving not more than 15 miles per hour as required by ordinance, was held properly refused as ignoring the principle of ordinary care by the driver in ascertaining the speed of the street car. [Liberty Highway Co. et al. vs. Callahan, et al., 157 N.E., 708.]

OKLAHOMA—*Definition of "Convenience and Necessity."*

Necessity does not mean indispensably requisite, when used in the expression "certificate of convenience and necessity." It means a public need, something without which the public is inconvenienced to the extent of being handicapped in the pursuit of business or wholesome pleasure or both—without which the people generally of the community are denied, to their detriment, that which is enjoyed by other people generally, similarly situated. [Chicago, R. I. & P. Ry. vs. State, 258 P., 874.]

TEXAS—*Compromise of Suit by Minor Upheld.*

Compromise of the settlement of a suit by a "next friend," in which the rights of minors are involved, should be scrutinized with great care and caution by trial courts, but where this has been done and the adjustment is fair and just to the minor and to his best interests, the compromise will be upheld. [Hernandez vs. San Antonio P. S. Co., 297 S. W., 264.]

TEXAS — *Negligence of Automobile Driver Defense to Suit for Injury to Automobile Guest where Driver has Interest in Action.*

Under the Texas law, property acquired by either husband or wife, except that which is the separate property of either, shall be deemed common property of both. This was held to prevent a wife from collecting damages because of the collision of an interurban car with an automobile in which she was a guest and her husband was the driver, where contributory negligence was charged against the driver. Alleged violation by the company of certain franchise conditions, where they had nothing to do with the accident, conferred upon the plaintiff no right to sue for breach of contract. [Northern Texas T. Co. vs. Hill et al., 297 S. W., 778.]

WASHINGTON—*Rights of Pedestrian in Front of Car at Street Crossing.*

A pedestrian crossing in front of a street car, standing at a regular stopping place, has a right to assume that the car will not start until he has passed or warning has been given. Hence he was not contributarily negligent when struck by the car.—[Whiting vs. City of Seattle, 258 P., 824.]

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Personal Items

Messrs. Blackhall and Heun in New Posts

Former Joliet official assumes new duties with North Shore, while Joliet man succeeds to managership there

J. R. BLACKHALL, veteran electric railroad executive of wide experience, has assumed his duties as general manager of the Chicago, North Shore & Milwaukee Railroad, the North Shore Line. As noted previously in the ELECTRIC RAILWAY JOURNAL, he succeeds John F. Egolf, who resigned to become vice-president and general manager of the Western United Gas & Electric Company, with headquarters at Joliet, Ill.

At the time of his new appointment Mr. Blackhall was serving as vice-president and general manager of the Chicago & Joliet Electric Railway, with headquarters in Joliet. His offices with the North Shore Line are at Highwood, Ill.

Mr. Blackhall went to Joliet to manage the city lines in 1900, rebuilding the system and constructing the Chicago & Joliet interurban line. In 1901 he left Joliet for New Jersey, but continued supervision of construction work on the Joliet lines. He returned to Joliet in 1904 to become general manager of the electric lines, and in 1925 he was also named vice-president.

Recognized as one of the leading authorities on electric railroad operation, Mr. Blackhall has made outstanding contributions to advancement of the industry. He is the inventor of a new type of truck for street cars, which is practically noiseless, and also has developed an aluminum body for street cars, which reduces the average weight of the car per passenger almost one-half. The so-called "Joliet" car with this new aluminum body was exhibited at the 1927 national convention of the American Electric Railway Association at Cleveland, Ohio.

William H. Heun, associated with the electric railway system in Joliet, Ill., for many years, has been appointed general manager of the Chicago & Joliet Electric Railway. In this capacity he succeeds Mr. Blackhall, appointed general manager of the North Shore System in Chicago, but who will continue as vice-president of the Chicago & Joliet Electric Railway.

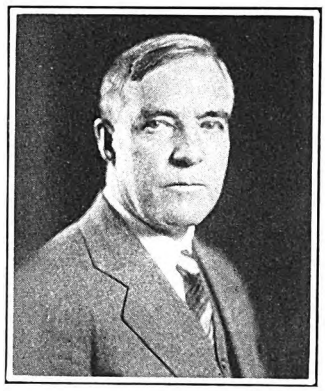
The new general manager has served as superintendent of transportation of the Joliet system for the last 23 years. He went to Joliet in 1892, after working at the printers' trade in Aurora and Chicago for about eight years. In search of health, he took the position of conductor on the local railway system. Soon he was called into the office and was made timekeeper and assistant cashier. Later he was made cashier and in 1904 was appointed superintendent of transportation.

His record in the latter capacity has been an excellent one. It is his intention to keep the Blackhall policies in force and to maintain the watchword of "service to the public" and "prevention of accidents."

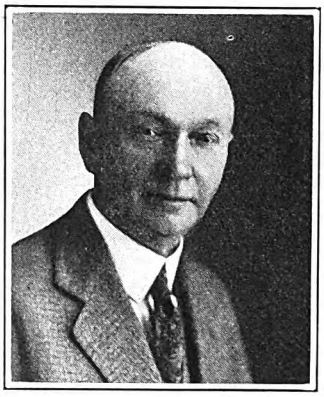
G. A. LeRiche Superintendent of Transportation

After serving for some time as assistant to the general manager of the Chicago & Joliet Electric Railway, George A. LeRiche was appointed superintendent of transportation on Oct. 15 to succeed W. H. Heun.

Mr. LeRiche is a native of Canada, going to Joliet in 1912 from New Brunswick. His first work with the railway was in the electric line department. In 1919, after serving in the army for ten months, Mr. LeRiche was made storekeeper and when the Chicago & Joliet Transportation Company, a subsidiary of the railway, erected its modern bus garage in 1926 he was named superintendent of automotive equipment, later being called into the general office as assistant to Mr. Blackhall, then general manager of the combined properties being operated out of Joliet.



J. R. Blackhall



W. H. Heun

HOWARD C. VENN is serving as industrial agent of the Interstate Public Service Company, Indianapolis, Ind. He succeeds W. Gerald Holmes, who has been transferred to the National Electric Power Company of New York. For a number of years Mr. Venn was connected with the Spann Company, one of the largest real estate firms of the city. He resigned from this company in 1913 to enter the real estate business for himself. As a member of the Indianapolis Real Estate Board he was at various times a member of the board of directors, treasurer and served on a number of appraisal committees of the board.

Messrs. Hardesty, Martin and Spofford Advanced in West Virginia

C. H. Hardesty, who has been manager of the Parkersburg and Marietta divisions of the Monongahela West Penn Public Service Company in West Virginia, was appointed assistant to the president of the company under a new plan of organization announced by President G. M. Alexander. He will be succeeded at Parkersburg by W. M. Martin of Fairmont, who has been superintendent of the power department district which includes the cities of Weirton, Wellsburg, Oakland, Terra Alta, Kingwood, Elkins and Parsons.

Under the new organization, additional responsibility is given R. W. Spofford, who takes over general charge of all railways and bus operations. Mr. Spofford has had charge of the railways on what is generally known as the Fairmont and Clarksburg division and the bus lines in this section, but in the future he will have charge of the transportation also in the Parkersburg and Marietta section.

Mr. Hardesty, who started with the Monongahela company in 1917 in the purchasing department, after some years in the employ of the Western Maryland Railway, was born at Wyatt, in Harrison County. He is well known in the local section. In 1919 he was appointed traveling freight and passenger agent, later being transferred to Clarksburg as division superintendent. He returned to Fairmont and served as general freight agent and then general traffic manager of all divisions until April 6, 1925, when he was transferred to the Parkersburg and Marietta division as manager. Mr. Hardesty will be located in Fairmont, and will not take over his new duties actively until after the annual convention of the State Utility Association.

Mr. Martin, who went with the local company about two years ago from the West Penn system, had charge of light and power at Grafton until he was appointed superintendent of the larger district. He has been a resident of Fairmont for some time and is well and favorably known there. Mr. Martin has already taken over his new duties in Parkersburg.

J. B. O'CONNELL is serving as superintendent of the North Avenue depot of the Chicago Surface Lines, Chicago, Ill. He has been at various times with the Surface Lines and the Pennsylvania Railroad since his graduation from the University of Illinois, class of 1923. He was enrolled in the university at the outbreak of the World War, but left to enlist in the United States Navy, where he was soon made a chief electrician. Returning to the university after the war he finished his course in railway electrical engineering.

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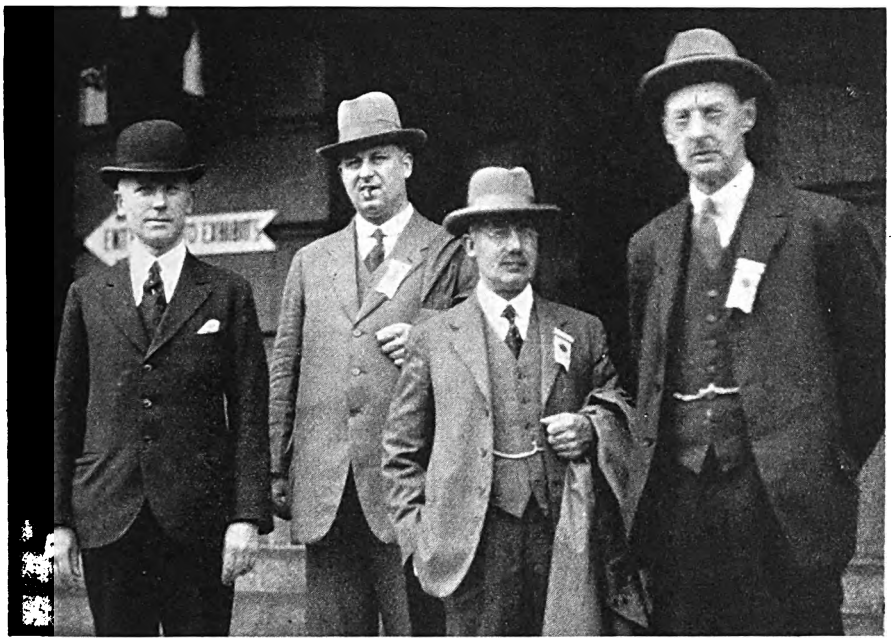
English Visitors Return Home

The representatives of the London Underground Railway and General Omnibus Companies who have been visiting this country returned to England on Nov. 2. They sailed from New York on the *Berengaria*. On the evening of Nov. 1 B. A. Hegeman, Jr., representative in the United States of the Underground Railway group, was host at a farewell dinner to the visitors. It was held at the Lotos Club. Some 30 railway officials and others from New York and vicinity were present.

The accompanying snapshot of the English visitors was made at the Cleveland convention. Left to right they are:



Officials of the London Underground Group who returned to England on Wednesday

J. P. Thomas, operating manager of railways; Owen Watson, research engineer London General Omnibus Company; W. S. Every, signal engineer of the Underground, and R. H. Pitts, staff officer of the Underground.

H. E. Dittmar and H. Bongard in New Posts in Brooklyn

Harry E. Dittmar has been appointed division superintendent at the 9th Avenue depot of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., to succeed the late Charles B. Attlesey.

Herman Bongard will succeed Mr. Dittmar as division superintendent at DeKalb Avenue depot.

Mr. Dittmar began his railroad career on the Brooklyn Transit System in 1905, having been employed previously in the Schenectady shops of the General Electric Company. In his fifteen years he advanced from the rank of motorman to assistant superintendent in charge of Maspeth depot.

Mr. Bongard goes to DeKalb Avenue depot with many years of experience as division superintendent at Bergen Street depot. He began his railroad career as a towboy for the Brooklyn City Railroad in 1887 and in 1889 was appointed a conductor at the old Greenwood depot of the Brooklyn-Manhattan Transit Corporation. Early this year, due to ill health, he was transferred to the staff of the accident prevention bureau.

Powell C. Groner Made President at Kansas City

Voting trustees representing the stockholders of the Kansas City Public Service Company, Kansas City, Mo., unanimously elected these directors on Nov. 3: E. M. Stayton, Henry Hanssen, P. W. Goebel, Herbert M. Woold, Powell C. Groner, Charles M. Howell, Henry N. Ess, James E. Chandler, Carl W. Allendoerfer, J. K. Newman, P. H. Saunders. The five trustees are: J. K. Newman, William Woolfolk, George W. Davison, Powell C. Groner and Walter S. McLucas. Mr. McLucas, who is chairman of the board of the Commerce Trust Company, Kansas City, replaces M. A. Traylor, who resigned two weeks ago.

The directors at their meeting the same day elected these officers: P. W. Goebel, chairman of the board; Powell C. Groner, president; John V. McKinney, vice-president; Fred. G. Buffe, vice-president in charge of operations; Neal S. Doran, comptroller; J. A. Harder, secretary and treasurer; L. M. Boschert and W. S. Walker, assistant secretary and assistant treasurer; H. F. Haynes, assistant secretary. Mr. Woolfolk declined to accept election to the position of the chairman of the board or as a director. There will be no change in the company policy and the improvement program to the physical property started by Woolfolk & Company will be completed in the next two years.

J. N. Shannahan Mentioned for Omaha Post

According to Omaha newspapers, J. N. Shannahan, former president of the Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va., is being considered for election to the presidency of the Omaha & Council Bluffs Street Railway, Omaha, Neb. If he were chosen Mr. Shannahan would succeed in that post Fred Hamilton, long a banker but a man who because of his other affiliations finds it impossible to give to the duties of his position with the railway the time and attention they rightfully deserve.

When he was asked about the matter in New York on Nov. 4 Mr. Shannahan said that it was true negotiations were in progress for his going to Omaha in the capacity of president, but that nothing definite had been determined.

CHRISTIAN J. LAURISCH, an attorney of Mankato, has been appointed a member of the Minnesota Railroad and Warehouse Commission by Governor Theodore Christenson effective on Jan. 1, 1928, upon the resignation of Ivan Bowen.

OBITUARY

David Williams

David Williams, former president of the David Williams Company, publishers of the *Iron Age*, died on Oct. 28. He was 85 years old. Mr. Williams was born in Waterford, Ireland, but came to this country with his father, John Williams, when only nine years old. After his graduation from Middletown Academy in 1857, he associated himself with his father in the publishing of the *Iron Age*, which John Williams had established two years before. Eleven years later David Williams assumed control of the periodical.

Mr. Williams retired from the presidency of the David Williams Company in 1909. He had been president of the American Trade Press Association and also of the Federation of Trade Press Associations in the United States.

H. GORDON GILPIN, former general manager of the Ohio Electric Railway, Springfield, Ohio, before it became segregated into various smaller units, died recently. In that position, he succeeded A. Benham. Mr. Gilpin had served as assistant general manager, with office at Lima, for six years. Previous to that he was connected with the operating department of the Cincinnati Traction Company, part of the time as assistant superintendent. He was also associated with the late W. Kesley Schoepf for about ten years, serving under him in Washington, D. C. Prior to his connection with the Cincinnati Traction Company Mr. Gilpin had been identified with the Mill Creek Valley Electric Railway.

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Manufactures and the Markets

$600,000 for Minneapolis Extension

Extensions by the Minneapolis Street Railway, Minneapolis, Minn., submitted to the City Council for 1928 will cost $600,000. Among them are extensions of the Chicago Avenue line from 48th to 54th Street, into Richfield, which was recently annexed to the city; Bloomington Avenue, France Avenue, Monroe Street, northwest terminal lines as may be determined and the double tracking of the West Broadway line to the city limits. Much preliminary grading will be required on some lines. Other expenditures will be for paving between tracks, replacing rails and other work.

Virginia Electric & Power Extending Belmont Avenue Line

Work has been started on a $63,000 extension to the Belmont Avenue street car line of the Virginia Electric & Power Company, Richmond, Va., to take care of the transportation requirements of the west end territory lying west of Byrd Park. The extension will be completed by Jan. 1. Plans call for the laying of 4,200 ft. of double track. F. Carter Womack, the company's engineer in charge of maintenance of way, will direct the work.

London Subways to Spend $12,500,000 on Equipment

The London Underground Electric Railways has just announced a program costing $12,500,000 for improvements. This sum will be spent during the next two years in the purchase of new cars and equipment for its underground lines. The step is in the interest of economy of operation.

Passengers to Decide Type of Car Seat for Interurban

Citizens of Dallas, Tex., and vicinity will have an opportunity to let the Texas Electric Railway know what type of car seat they prefer for interurban use.

The Texas Electric Railway, operating interurban lines from Dallas to Denison, Dallas to Waco and Dallas to Corsicana, is said to plan to go to its patrons to obtain this information. James P. Griffin, vice-president in charge of operation, examined different types of interurban seats now being manufactured and has fitted up a car with several of them.

In anticipation of the plan being put into operation, Mr. Fewell, general passenger agent, is reported to have said:

We did not want to decide which type is best without taking our patrons' wishes into consideration. So we hit upon the plan of equipping our car No. 325 with all of these different sample seats and running it up and down the line.

In this car there are six different types of the latest developments in interurban seats. We are asking our friends who travel with us to try out these seats, which are all numbered plainly. The conductor on No. 325 has some cards with spaces for you to use in telling us the number of the seat the riders like best.

There is also space for remarks as to the seating arrangement, spacing, and so on, which might make our service more comfortable.

In continuing, he suggests to the public that ride car No. 325 to "be sure to get a card, fill it in and return it to the conductor."

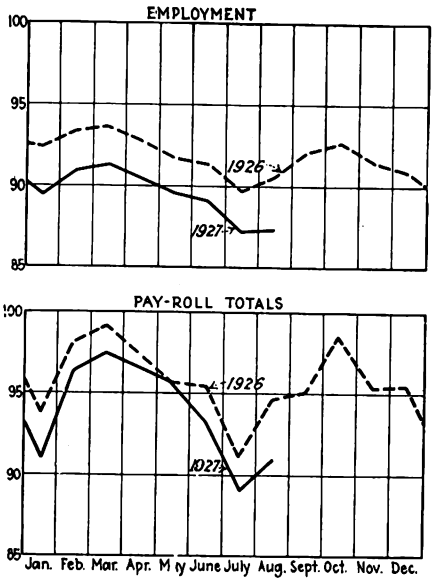
Twelve Cars to Be Ordered for Knoxville

An order for twelve new cars will be placed immediately by the Knoxville Power & Light Company, according to a recent announcement by Col. C. H. Harvey, president of the company, it is reported. The cars will cost approximately $150,000. They are intended for operation on the Lonsdale, Lincoln Park and Fountain City lines.

Employment in Manufacturing Industries Showed Upward Trend in August

One-tenth of 1 per cent increase in August, 1927, as compared with July. Data on car building and electric railroads employment given

EMPLOYMENT in the manufacturing industries increased one-tenth of 1 per cent in August as compared with July and payrolls increased 2.1 per cent, according to the last labor report of the bureau of statistics of the United States Department of Labor. "The easing off of the vacation season and the completion of July inventory taking and repairs," says the report, "account in part for these increases, although a well-defined upward trend appeared in several industries. The level of employment in August, 1927, nevertheless, was 3.6 per cent lower than in August, 1926, and payroll totals were 3.8 per cent lower."



Employment and payroll charts from "Monthly Labor Review"

The bureau of labor statistics weighted index of employment for August, 1927, is reported as 87.4, as compared with 87.3 for July, 1927; 89.1 for June, 1927, and 90.7 for August, 1926; the weighted index of payroll totals for August, 1927, is 91.0, as compared with 89.1 for July, 1927; 93.3 for June, 1927, and 94.6 for August, 1926. The report for August, 1927, is based on returns made to the bureau of labor statistics by 10,918 establishments in 54 of the principal manufacturing industries. These establishments in August had 3,028,729 employees whose combined earnings in one week were $80,566,040. Thirty-two of the industries had more employees in August than in July and 40 industries reported increased payrolls. The iron and steel industry showed 1.2 per cent drop in employment, with an increase of 4.9 per cent in payroll totals. Car building and repairing electric railroads, based on reports from 383 establishments, showed the number on the pay-

Industry	United States, Cents	Geographic Division: New England, Cents	Middle Atlantic, Cents	East North Central, Cents	West North Central, Cents	South Atlantic, Cents	East South Central, Cents	West South Central, Cents	Mountain, Cents	Pacific, Cents
Electrical machinery, apparatus and supplies:										
Low	33.0	33.0	40.0	39.0	35.0	40.0	....	....	....	....
High	61.0	48.0	51.0	61.0	40.0	40.0	....	....	....	....
Average	44.2	42.8	41.6	49.2	37.5	40.0	....	....	....	....
Public utilities:*										
Low	20.0	40.0	32.0	32.5	30.0	20.0	25.0	27.0	35.0	33.0
High	71.5	71.5	63.0	60.0	40.0	45.0	40.0	35.0	40.0	56.3
Average	39.8	47.4	45.5	45.9	33.4	32.9	29.1	29.2	36.7	47.9

* Including street railways, gas works, waterworks, and electric power and light plants.

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roll as of July, 1927, as 25,420, as compared with 25,543 for August. This was a per cent of change of +0.5. For July, 1927, there was a $768,549 payroll, as compared with $784,515 for August, 1927, a +2.1 per cent of change.

A comparison of the employment and payroll totals in August, 1927, against those of August, 1926, reveals that employment in manufacturing industries was 3.6 per cent lower in August, 1927, than in August, 1926, and that payroll totals were 3.8 per cent lower. The per cent of change in the car building and repairing for electric railroads for August, 1926, and August, 1927, respectively, shows as follows: +3.5 per cent and +2.2 per cent. Per capita earnings in the electrical machinery apparatus and supplies industry for August, 1927, as compared with the preceding month and August, 1926, are as follows: July, 1927, 3.9; August, 1926, 1.4. For the car building and repairing electric railroad industry the per cent of change for August, 1927, as compared with July, 1927, was +1.6, and in August, 1926 —1.3.

The car building and repairing electric railroads industry out of a total number of 383 establishments reporting from July 15 to August 15 shows one increase in wages affecting 65 employees. The electrical machinery apparatus and supply industry with 75 plants reporting shows one increase affecting nineteen employees. The percentages of increase in the wage rates were 16.7 per cent and 5.0 per cent respectively.

Turning to another section of the report, there is found some interesting data on entrance wage rates for common labor as of July 1, 1927. According to the report, the term "common labor" has many interpretations among different industries and even among different localities or plants in the same industry. Owing to these difficulties in the way of securing comparable data as to wage rates for common labor, the bureau of labor statistics has confined these statistics to entrance rates alone; that is, the data here presented are based on the rate of pay per hour given unskilled male adult common laborers when first hired.

The survey is limited to thirteen important industries which supplied the principal number of common laborers. Some establishments have reported two rates; for example, one for a ten-hour day and one for an eight-hour day, or one for white and one for colored or Mexican workers. Incidentally, the report shows that there were 15,989 common laborers employed by public utilities as of July 1, 1927. The weighted average entrance rates per hour of all industries covered, including general contracting, have been as follows:

July 1, 1926	42.8
Oct. 1, 1926	43.4
Jan. 1, 1927	43.2
July 1, 1927	42.6

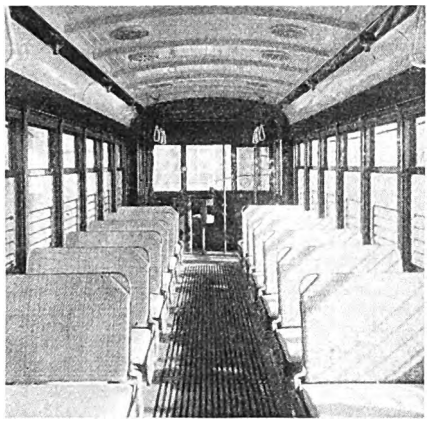
Continuing, the report says: "Omitting the data for general contracting, which was first included in these compilations on July 1, 1926, average entrance rates per hour for the periods studied have been as follows:

	Cents
Jan. 1, 1926	40.2
April 1, 1926	40.5
July 1, 1926	40.9
Oct. 1, 1926	40.9
Jan. 1, 1927	41.0
July 1, 1927	40.4

The accompanying tables show for each industry the high, low and average entrance rates per hour in each geographic division and in the United States as a whole.

Shipment of Four Cars to Carolina Power & Light Completed

Shipment of the four special safety motor cars for the Carolina Power & Light Company, Raleigh, N. C., was recently completed. The order, placed with the J. G. Brill Company on July 16, was announced in the JOURNAL for Aug. 13.



Interior view of one of the four safety cars built for the Carolina Power & Light Company, Raleigh, N. C.

The cars are of the one-man, double-end, single-truck type with Brill 79-E-2 trucks. They are 32 ft. 10½ in. over all, weigh 14,000 lb. and have a seating capacity of 40.

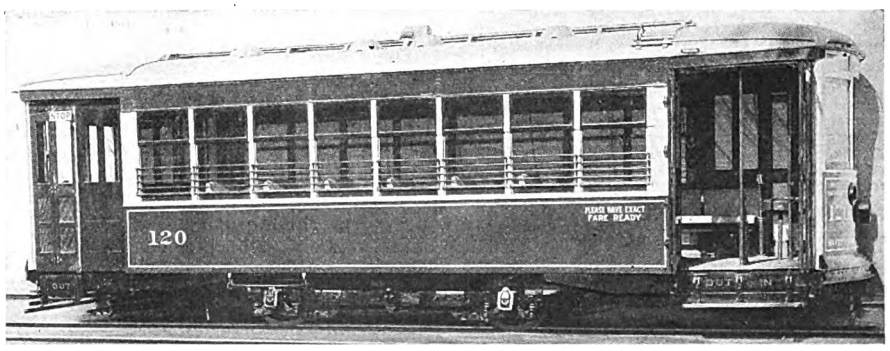
The specifications as given by the Brill company are appended:

Number of units	4
Type of unit	One-man, motor, passenger, city, double end, single truck
Seating capacity	40
Builder of car body	J. G. Brill Co.
Date of order	July 16, 1927
Date of delivery	Sept. 27, 1927
Weights:	
Car body	11,940 lb.
Trucks	5,640 lb.
Equipment	4,586 lb.
Total	22,166 lb.
Length over all	32 ft. 10½ in.
Length over body posts	20 ft. 6½ in.
Truck wheel base	9 ft. 0 in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	10 ft. 7½ in.
Window post spacing	29 in.
Body	All steel
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Plain
Axles	A.S.T.M. spec. A-20-21 annealed
Car signal system	Faraday
Conduit	Flexible
Control	G.E. "K" double end
Couplers	Portable
Curtain material	Pantasote
Destination signs	Keystone
Doors	End, folding
Fare boxes	Cleveland, model 5
Finish	Paint
Floor covering	Painted
Gears and pinions	G.E. grade M
Glass	Double-thick American
Hand brakes	Brill vertical handle
Hand straps	Rico No. 2
Heaters	Gold single coil truss plank
Headlights	Golden Glow SM 95
Interior trim	Mahogany
Journal bearings	Plain
Lamp fixtures	G.E. 009
Motors	Four G.E.-265 A, 35 hp.
Painting scheme	Yellow
Roof material	Wood covered with canvas
Safety car devices	Safety Car Devices Co.
Seats	Brill 201
Seat spacing	29 in.
Seating material	Rattan
Slack adjusters	Brill air-operated
Steps	Folding
Step treads	Wood with Feralun
Trolley catchers	Ohio Brass
Trolley base	U. S. No. 3-E
Trucks	Brill 79-E-2
Ventilators	Brill exhaust
Wheels, type	27-in. rolled steel
Wheelguards	H.B.
Special devices	National Pneumatic door and interlocking switches

Copper Strong, Zinc Breaks

Sales of copper both in the United States and abroad have been better than was generally expected, with the result that the price situation is firmer than for weeks, with most sellers out of the market at their long-held quotation of 13¼ cents delivered Connecticut. Lead demand has improved somewhat, but the price is no better. Zinc has been the weak sister among the metals, last week's break below 6 cents, St. Louis, having continued, with the 5¾-cent level reached Nov. 1.

Most of the copper sold in the last week has been between 13.20 and 13.25 cents, delivered Valley, though one small lot went out as low as 13.175 cents. During the week a good tonnage was sold in the Middle West at slightly higher prices than would be represented by the usual ⅛ cent differential, bringing the f.o.b. refinery price average up to 13.025 cents. On Nov. 2 a good tonnage was sold at 13¼ cents delivered at usual



Four safety cars of this type for the Carolina Power & Light Company

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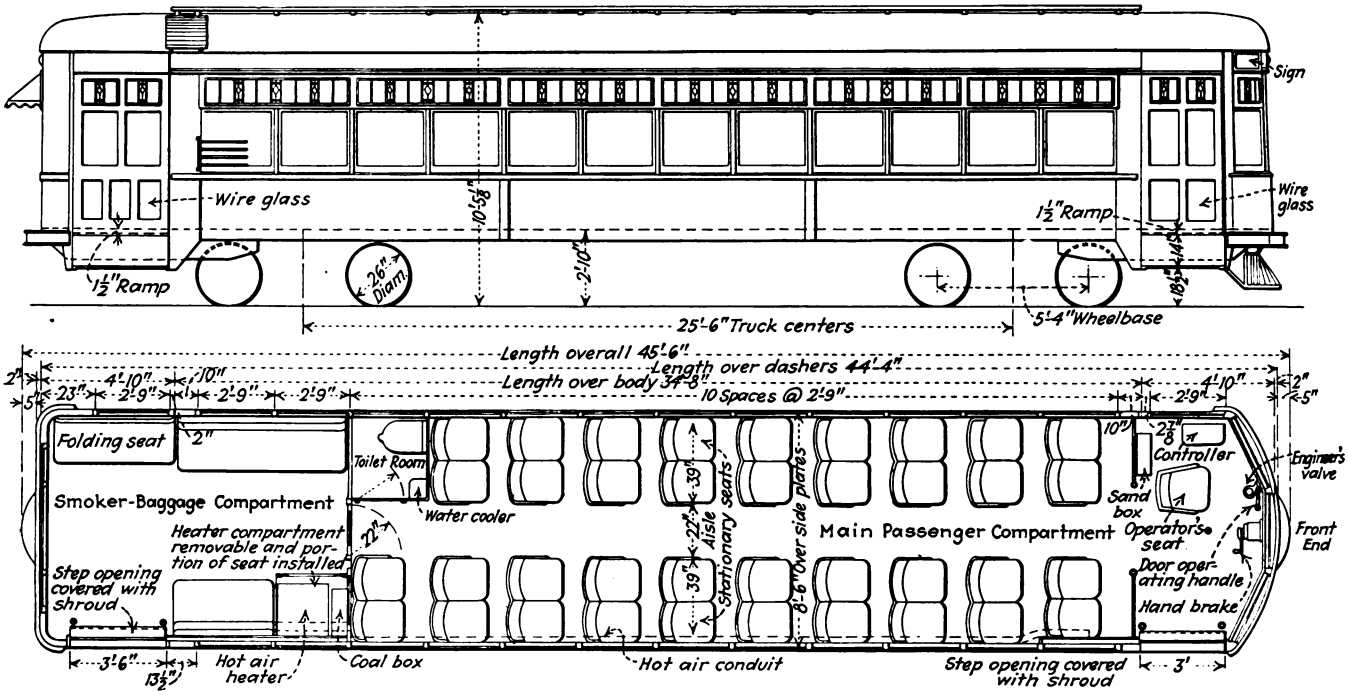
Four Interurban Units Ordered by Kansas City, Leavenworth & Western



Following are specifications, seating plan and elevation for the four one-man, interurban, semi-steel cars ordered on July 20 for the Kansas City, Leavenworth & Western Railway, Kansas City, Kan. This order, which was placed with the American Car Company, St. Louis, was announced in ELECTRIC RAILWAY JOURNAL for Aug. 13. The cars will be painted in a color scheme of blue, ivory and red, the colors to be used on the roof, center, bottom and letter board respectively. Four GE-247 inside-hung motors will furnish the power and the bodies will be mounted on Brill 177-E-1 trucks. A spacious smoking compartment of observation car design will be one of the outstanding features of these cars.

Number of units	Four
Type of unit	One-man, motor, passenger, single end, double truck
Number of seats	47
Builder of car body	American Car Company, St. Louis, Mo.
Date of order	July 20
Length over all	45 ft. 6 in.
Length over body posts	34 ft. 8 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	10 ft. 8 in.
Window post spacing	33 in.
Body	Semi-steel
Roof	Arch
Air brakes	G. E. straight
Car signal system	Faraday
Compressors	CP-27
Conduit	Flexible
Control	K-75
Couplers	American Car Co.
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	American Car Co.
Doors	End
Finish	Enamel
Floor covering	Rubber tiling
Gears and pinions	G. E.
Glass	D. S. A.
Hand brakes	Brill vertical
Heaters	Hot air
Headlights	G. E. luminous arc
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain
Lamp fixtures	American Car Co. indirect lighting
Motors	Four G. E.-247, inside hung
Painting scheme	Blue roof, ivory center, red bottom, and letter board
Roof material	T. & G. board
Sash fixtures	Schechter post casing
Seats	Brill bucket type
Seat spacing	33 in.
Seating material	Leather
Steps	Stationary
Step treads	Kass safety
Trolley catchers	Eclipse
Trolley base	Ohio Brass
Trolley wheels	Ohio Brass
Trucks	Brill 177-E-1
Ventilators	American Car Company
Wheels	26-in. rolled steel
Wheelguards	Steel pilot

Eastern points, but a general advance in quotations was made to 13⅜ cents, at which price some business was also booked. The foreign price was advanced to 13.70 cents Nov. 2, after an excellent week's business at 13.60 cents.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Nov. 1, 1927
Copper, electrolytic, cents per lb.	13.025
Copper wire, cents per lb.	15.25
Lead, cents per lb.	6.225
Zinc, cents per lb.	5.787
Tin, Straits, cents per lb.	57.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.10
Somerset mine run, Boston, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.125
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.50
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.58

A fair volume of buying at unchanged prices, for the most part, has characterized the lead markets during the week. The American Smelting & Refining Company continued to maintain its official price for the New York territory at 6.25 cents.

In the Middle West the leading interest, possibly encouraged by a slight upward tilt in the London market, quoted 6.025 cents and got it on several orders. However, the price was reduced the following day, and 6 cents was the prevailing price on Nov. 2.

The zinc market continues disappointing, both from the producing and consuming standpoints.

Spot lots of high-grade continue nominally at 7¾ cents. Prime Western in New York is at the customary differential of 35 cents per 100 lb. above St. Louis quotations.

With the bears apparently in the ascendency in the London tin market, and every one expected further declines, buyers in the domestic market naturally have confined their purchases to immediate requirements only. The price has sagged each day and with London cables off 27 s. 6 d. Nov. 2, spot Straits is available at 56⅞. December is about ⅛ and January about ¼ cent lower.

TRADE NOTES

WHITING CORPORATION, Harvey, Ill., announces the death of its vice-president and director of sales, Norman Spear Lawrence, Wednesday, Oct. 26, 1927, of pneumonia. Mr. Lawrence was born May 9, 1882, at Chicago, Ill., and was educated in the schools of Chicago. He was graduated from Cornell University in the class of '04 as a mechanical engineer, and shortly after entered the employ of the Whiting Corporation, Harvey, Ill., as an estimator, becoming successively chief estimator, assistant sales manager, vice-president and director of sales. During the past few years Mr. Lawrence was also president of the Swenson Evaporator Company, which is a subsidiary of the Whiting Corporation.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, November 12, 1927 *Number 20*

Nine Years Ago!

NINE years ago yesterday men's pulses beat in their throats. A delirium of joy possessed the world. The guns thundered no more! Eleven o'clock on Nov. 11, 1918, was chiseled on the order of American patriotism beside those other imperishable anniversaries that make us envy the dead "who loved and were loved" and who are now enshrined in the soil of France and their native land.

They left the workshop and the desk. They relinquished the most precious gift vouchsafed them by their Creator. They merged their personalities into a man-made hell that out of its vortex should come institutions that would create instead of destroy; that would serve mankind.

We cannot quicken their dust. Yet we can on each anniversary of their sacrifice renew our determination to hold high the torch that fell from their hands, to keep faith with them in order that they may sleep undisturbed in Flanders Fields.

Municipal Railway Bond Proposal Defeated in San Francisco

FOR the second time in less than six months the voters of San Francisco have rejected the proposal to authorize a bond issue of $4,600,000 to provide funds for the extension of the municipal railway. Moreover, the defeat was decisive. The measure lacked 8,807 votes of the required two-thirds to pass. Last June when a similar measure was defeated supporters of the proposal advanced the theory that the defeat was due to the light vote. There was no light vote this time. It was, as a matter of fact, the heaviest vote ever cast at a San Francisco municipal election.

The measure was not without its ardent advocates. The extensions to the municipal railway really are in the nature of a moral obligation on the part of the city. One of the proponents of the measure who pointed this out was none other than Senator Hiram W. Johnson. He spoke better than he knew when he said that San Francisco has a 5-cent car fare because the city owns a railway system. As the Senator saw it, San Francisco in its municipal railway is an object lesson to the entire nation. There is no fault to be found with the system there so far as the technical skill shown in the conduct of the railway is concerned, but that is an object lesson very different from the one the Senator from California had in mind. Moreover, there was in the Senator's statement evidence of a strange confusion of cause and effect. There is no need now to debate the issue. The two sides to the question were reviewed quite fully in comment which appeared in the issue of ELECTRIC RAILWAY JOURNAL for June 25. The important point is that it is extremely difficult not to consider as very significant the barrier which has been interposed by votes adverse to the bond issue registered twice within a period of less than six months.

A Permanent Place for the Street Car

EVIDENCE continues to accumulate that the street car has a place in the modern urban transportation scheme. No less an authority than the Kansas City *Times,* which has so often been a severe critic of the electric railways, recently said editorially, commenting on the Cleveland convention:

> Leaders of the electric railway industry are confident that they are demonstrating their ability to meet the changed conditions brought about by the advent of the private automobile. The first condition depends on the second. The continuance, to say nothing of the profitable operation of any type of transportation, is determined by the degree of service which it is prepared to render, by the readiness of those in charge of it to meet the public demand.
>
> There is evidence that the management of electric railways is becoming thoroughly alert to this contingency. . . . Two conditions seem to favor the street car as an important agency in city transportation. They are the comparatively moderate expense of its use and the fact that it is an aid to the relief of traffic congestion. . . . The two advantages of the street car, coupled with the possibility of constantly bettering its service, seem to give it a fair chance not only to survive but to operate on a reasonably profitable basis.

From an entirely different source, the Philadelphia *Evening Ledger,* comes additional confirmation of this viewpoint. Speaking editorially on the situation in South Jersey, it says:

> Engineers familiar with the general science of transportation have always known that no conceivable development in the design of motor buses will offer an adequate substitute for railroad service. In a lesser way the same rule applies to trolley cars. Street cars have a place in the scheme of city and interurban transit which even the best of the modern motor vehicles cannot fill. The residents of National Park, Westville and other communities south of Camden have been learning by this experience. Privately operated buses, less commodious and dependable than the street cars, were warmly welcomed in these towns, and a time came when trolleys were operating at a loss and had to be withdrawn. The various communities are now appealing to the Public Utilities Commission. They want the street cars restored.
>
> When all such differences are finally settled, it will be found that places exist in every scheme of intercity transit for trolleys, motor buses and railway trains. The thing to do is to find the place for each and keep it where it belongs under a permanent system of protected and regulated traffic.

From still another angle, there is the statement of C. E. Smith, the consulting engineer who made a report on the rapid transit situation in New York City, which appeared in abstract in this paper for Oct. 29. In discussing the New York surface cars he says: "Surface car lines are not obsolete and their business is not decreasing. On the other hand, they are becoming more and more important as a neighborhood convenience and necessity." And this is held to be true in a city where, according to J. P. Thomas, operating manager of the London Underground System, congestion in the streets exceeds anything anywhere in Europe!

Surely when disinterested observers are finding all this

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good in the street cars, there must be something to it. It is now time for their detractors to show if they can how the congestion is to be lessened and the people carried to better advantage if the street cars are driven off the streets.

New England Railways Escape Serious Flood Damage

WITHIN the period of eight months a second large area of this country has suffered severe injury from destructive floods. Last spring the swollen Mississippi River was the cause of untold destruction along its valley. More recently the rivers of New England, particularly the Connecticut, have been on the rampage.

Damage to electric railway properties resulting from these floods has been less than might have been expected. The localities in the Mississippi Valley, where the greatest destruction occurred, were mostly agricultural communities. Comparatively few towns large enough to have electric railway service were hard hit. Similarly in Vermont, where the recent New England floods were at their worst, most of the towns affected had no street railway systems. Further south, in Massachusetts and Connecticut, the floods came down upon more populous communities and caused serious disruption of their transportation service. Elsewhere in this issue is an account of the difficulties encountered at Holyoke, Springfield, Hartford and other towns in that district. As the flood waters recede it appears that the permanent damage to physical property is slight. Suspension of service, however, has entailed large revenue losses. The railways spared no efforts to resume service, and have already made great strides in restoring normal conditions.

Feeding the Political Cat Another Gold Fish

PROPONENTS of the measure to enable the city of New York to borrow $300,000,000 beyond its present debt limit for the construction of new transit lines, particularly subways, are jubilant at the impressive victory which was scored for the proposal at the election on Nov. 8. Of course the prospects are pleasing to the party that is in power, but to the sober minded the thought occurs as to how much longer this stark madness on the part of the city can go on without its eventual and concomitant calamity. Only recently the Board of Estimate appropriated about $13,000,000 out of the budget for subway construction. The plan is to put in increasing amounts for the next four years. Contracts awarded for such subways now total $166,395,328 out of a probable $674,000,000.

The present Mayor of New York may be a little less vociferous than was his predecessor in office, but his sense of the eternal fitness of things is apparently no more acute than was Mr. Hylan's. Over the protests and warnings of Comptroller Berry the Board of Estimate, at his Honor's urging, continues to spend money like a drunken sailor. As that astute financial observer *Barron's* recently said, the city's figureheads, with here and there an exception, are plausible. And good politicians always are plausible. That is what makes them good politicians. Golconda is at their very doors. And they know it.

Administration of New York City is the largest public enterprise in the country, outside of the United States Treasury. The spoils are rich. And in politics, at least in New York City, to the victor belong the spoils. City bonds are exempt from federal and state income taxes, and the city's credit is therefore high. Somehow or other the revenues can be raised. If it is inadvisable to increase the tax rate, the assessment value can be boosted. It seems absurd, but it is a fact.

In 1917, the last year of the Mitchel administration, the city budget was $200,000,000. For 1928 the amount is $512,000,000. And Mr. Berry, the single administration thorn in the side of the spoilsmen, has warned of an impending budget of $1,000,000,000 in the not far distant future. But still the good old game of squander goes on, as *Barron's* has said, under "a tailor's model with a speaking attachment, wound up to say '5 cents' as often as necessary." As this same authority points out, if the annual cost of city administration were half what it is, the citizens of New York would be billions richer. But New York doesn't care. It appears to be ever ready to feed the political cat another gold fish.

A Death Warrant for Governmental Business

SINCE the ancient empire of the Pharaohs entered business, governments have regulated and in many instances have run businesses of a more or less public character, such as waterworks, ferries, gas, electric and railway enterprises, with the net result that they have made woeful failures in this line of activity. So writes Prof. Arthur S. Dewing of the Harvard Business School, in a concise and convincing exposé of "Why Government Fails in Business," appearing in a recent issue of the *Annalist*. The reasons given by this authority are: (1) Governments "endeavor to function without recognizing the rule in industry of profit"; (2) the ultimate test of the value of governmental operation rests with its ability to meet competition in commodities delivered to the ultimate consumer for services rendered; (3) profits represent a negative cost in that without profits the ultimate cost of goods produced or services rendered is greater than with profits; (4) unlike private enterprises, the directing heads of government businesses "carry on" whether the enterprises are failures or successes.

What is more important than these blunders, Professor Dewing sees the melancholy and deceitful fact that government business undertakings—premised upon no profits—are conducted with increased cost by reason not only of inefficient management, but because high real costs are masqueraded as low apparent costs, with the result that some form of taxation absorbs the slack. Also, most governmental enterprises are planned for immediate needs and not designed on a large capital investment that will reach forward over the longest stretches of time.

From the standpoint of fact and theory, Professor Dewing's analysis should be the death warrant of governmental business. Such enterprises habitually are economically unsound and present one of the most dangerous stumbling blocks to the march of progress. No industry realizes this more than the utilities, and most particularly the railways, which in several instances have been throttled by such competition. Now is the time to support the United States Chamber of Commerce's dictum that our government should retire permanently from business and let private enterprise march forward to greater achievements and reduce costs of the ultimate consumer. Which shall we have—communistic theories and socialistic failures, or sound business administration in which producer and consumer alike share the benefits? The foundations of our country rest in the decentralization of government.

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The Jitney to Go in Detroit

DETROIT has won out over the jitneys at last. The victory has been a long time coming, but it was well deserved. The fight has lasted more than four years. The legal points at issue were made plain in the article in the JOURNAL for Oct. 22. It would seem that the matter has been defined by the courts in a manner sufficiently clear so that a quietus has been sounded on any attempt at appeal. The course of the direct action that will be taken by the city against the jitney has not been decided, but it is not unreasonable to suppose that the city will proceed against the jitneys no less militantly than it did in the first instance and on a plan fully as wide in its application as was the original one.

It seems incredible at this late day, when the matter has become a thing of the past almost everywhere else, that the jitney remained an issue in Detroit, but there were special reasons why this was so, reasons that did not govern elsewhere. With them there is no concern at this time. The question of the removal of the jitneys in Detroit has passed from a speculative one to one of fact, one of how now best to proceed. That is the work upon which the city officials are now engaged. Everywhere else that it appeared the jitney was a pest. It was no less so in Detroit, in which city it is estimated these usurpers carried 35,000 passengers a day, the great majority of whom should now become patrons of the cars or buses of the City Department of Street Railways. The jitneys in Detroit performed no function that the regularly organized railway and bus systems there cannot perform and no service that these systems are not prepared to perform, judging from the willingness so to do as demonstrated in the past.

Learn Your Company

"PEOPLE die of many things, but few from possessing too much knowledge. So also a number of persons fail to get ahead in their chosen business, but few because they know too much about it." These two sentences from the opening paragraph of an editorial in the *I.S.C. News,* published by the Indiana Service Corporation, are worthy of much thought by those who are striving to improve service and attain *finesse* in supertransportation.

How many times a day does the average passenger hear: "I do not know;" "I am not familiar with that part of the system;" "I've never been on that run," and a hundred other negative answers that reveal a total lack of familiarity with the company operation.

Like charity, information should begin at home. Nine times out of ten, it is not a lack of interest on the part of the employee in company affairs, but rather his company's lack of interest in a plan for instructing him in these matters. If it is his company's policy to "tell him" *he* will tell the public. A sentry on duty represents the might, and assumes the entire responsibility for the safety of the army in which he is enrolled. At one time or another every employee is in this rôle. If he is forewarned he is forearmed to combat adverse public opinion and ameliorate the traveler's difficulties. In short, in the words of the editorial just referred to, "an employee of the Indiana Service Corporation" (and any public utility), "who knows its size, its scope and business objective, is not only in a better position to answer the questions of the general public concerning this company, but is also in a much better way able to appreciate the company's problems and aid in their solution."

In this pronouncement there is a lesson to be learned by every public utility. The American being of a most inquisitive nature nothing is more appreciated than full, concise and reliable information. It is the open sesame to a full fare box and to a contended and cemented corporate family. The little editorial "Learn Your Company" is worthy of nation-wide distribution.

Research Takes on a New Significance

RESEARCH was invested with a new significance by Edward J. Mehren, vice-president of the McGraw-Hill Publishing Company, Inc., in an address recently made before the Chicago Association of Commerce. After presenting an exposition of its great value as one of the long-term guarantees of prosperity, he epitomized the situation as follows: "I hold out to you a promise—future industrial success—if you employ research, and I hold out a threat—industrial lameness and decay—if you neglect it."

Nowhere will this utterance strike a more responsive chord than in the hearts of the leaders of the transportation industry. Modern transportation is built upon research, and its continued progress demands further research without thought of cessation. It is research that developed the steam locomotive, the electric car, the gasoline automobile and its child the motor bus. It is research that has made it possible for the industry to promote speed with safety. It is research that has made it possible for one man to do the work of two in the transportation department, in the shop and on the track.

This last element, the reduction in man-power needed to perform a certain task, is shown by Mr. Mehren to be the greatest factor in our present material prosperity. The last United States census of manufactures showed that the volume of our manufactured goods in 1925 was $2\frac{3}{4}$ times that of 1899, but that the number of men employed was only 1.8 times as great. In other words, each man now produces 50 per cent more than he did in 1899. The reason is that we now use $3\frac{1}{2}$ times as much power.

As a result of this greater productivity, there has been developed a higher standard of living for the individual, and these men thrown off as surplus labor by the older industries have gone into new industries and are making products undreamed of in 1899. This important phenomenon is at the bottom of our prosperity. If we understand how it occurred and what has made it possible we shall know some of the long-time guarantees of prosperity.

Back of the immediate and commercial types of research there must be another type of research, deeper in character, concerned with pushing back the boundaries of the unknown. On the results of this deeper type of research is built all of the great development that has made for the progress of the world since history began. Investigations of this type cannot be controlled. It is not possible to know beforehand what the result may be. It must suffice the investigator to know that there should be a result, either positive or negative. This type of research is to industry what the telescope is to the astronomer. The field is limitless.

Mr. Mehren's conclusion, "It is the responsibility of every American business executive to give generous support to cost reduction efforts and to industrial and scientific research," will undoubtedly be subscribed to by every far-seeing executive in the electric railway industry.

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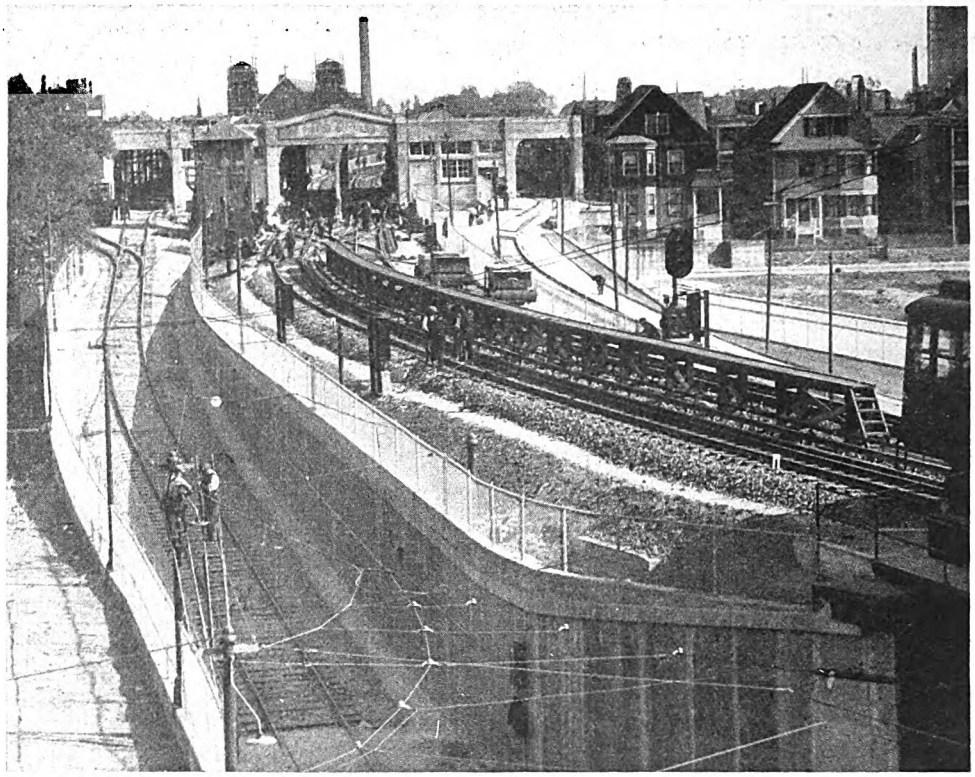

The surface cars loop at the principal rapid transit stations so as to provide for a convenient transfer

Dorchester Rapid Transit Extension Completed*

By E. L. Lockman

Assistant to the Superintendent of Maintenance
Boston Elevated Railway

Former steam railroad right-of-way will be utilized by Boston Elevated Railway in part for rapid transit service and in part for high-speed trolley operation. Details of construction are given

PREVIOUS to 1923 the residents of the Dorchester district of Boston had for several years urged the necessity of improved transportation facilities. It was suggested, among other things, that the Cambridge-Dorchester tunnel be extended to Meeting House Hill and possibly beyond that point. During various discussions the proposition of using one or more of the branch lines of the New Haven Railroad was advanced by Charles A. Ufford. The Department of Public Utilities and the Transit Department of the city of Boston, acting as a joint board in 1922, reported to the Legislature a comprehensive rapid transit system for the Dorchester district. On May 25, 1923, Governor Cox approved "An Act for the Extension of Rapid Transit Facilities in the Dorchester District of the City of Boston." This act was accepted by the City Council and approved by the Mayor of Boston on Sept. 12, 1923. After surveys and estimates had been made, a plan acceptable to those interested and the Boston Elevated Railway was approved.

The Shawmut Branch, extending from the main line of the Boston Division of the New Haven Railroad at Harrison Square to Milton and Mattapan, a distance of approximately 4.25 miles, with double track to Milton and then single track to Mattapan, was purchased by the city from the New Haven Railroad. In order to connect the existing Dorchester Tunnel of the Boston Elevated Railway system with the Shawmut Branch it was necessary to extend the tunnel from Andrew Square terminal under the New Haven tracks and under Boston

**Abstract of a paper presented at a meeting of the New England Street Railway Club, Boston, Mass., Oct. 27.*

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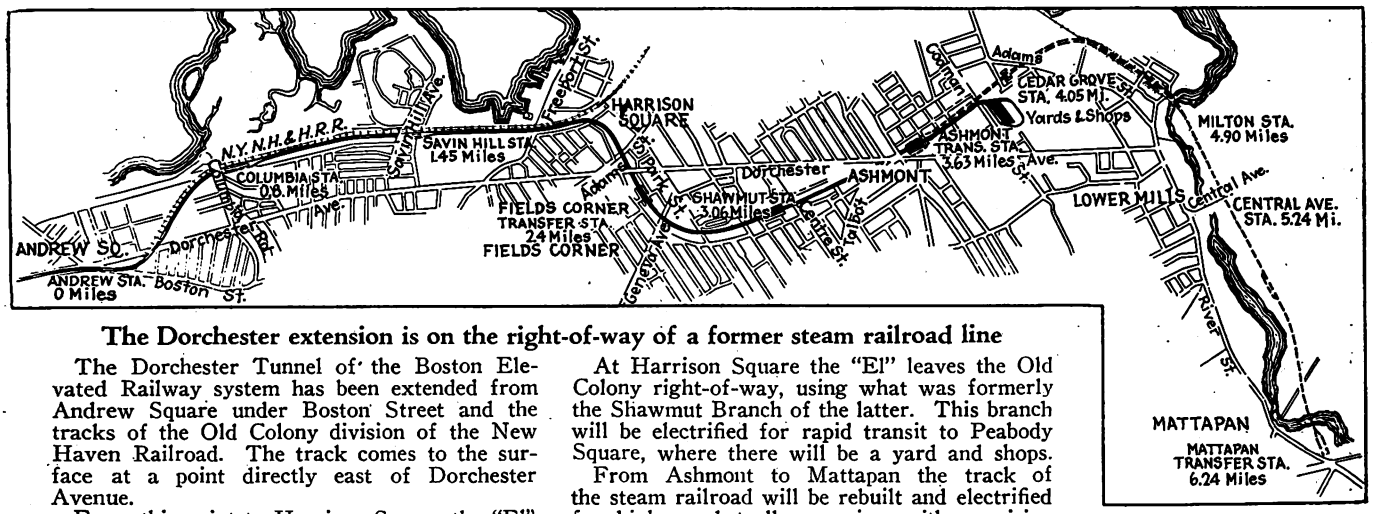


The Dorchester extension is on the right-of-way of a former steam railroad line

The Dorchester Tunnel of the Boston Elevated Railway system has been extended from Andrew Square under Boston Street and the tracks of the Old Colony division of the New Haven Railroad. The track comes to the surface at a point directly east of Dorchester Avenue.

From this point to Harrison Square the "El" tracks have been constructed on the west side of the right-of-way of the New Haven. This necessitated the relocation by the steam railroad of its own tracks for a distance of about 4,500 ft. between Columbia Avenue and Savin Hill on the easterly side of the railroad property.

At Harrison Square the "El" leaves the Old Colony right-of-way, using what was formerly the Shawmut Branch of the latter. This branch will be electrified for rapid transit to Peabody Square, where there will be a yard and shops.

From Ashmont to Mattapan the track of the steam railroad will be rebuilt and electrified for high-speed trolley service, with provision for convenient passenger interchange at Ashmont.

The completion of this project will add more than 6½ rapid-transit route-miles to the system, including more than 2½ miles of high-speed trolley route on private right-of-way.

Street, then curving to the left under Dorchester Avenue and coming to the surface beyond Dorchester Avenue parallel with the railroad tracks. From this point to Harrison Square the Transit Department was obliged to purchase additional land and move the four tracks of the New Haven Railroad to the east in order to provide a two-track right-of-way 35 ft. in width for rapid transit purposes.

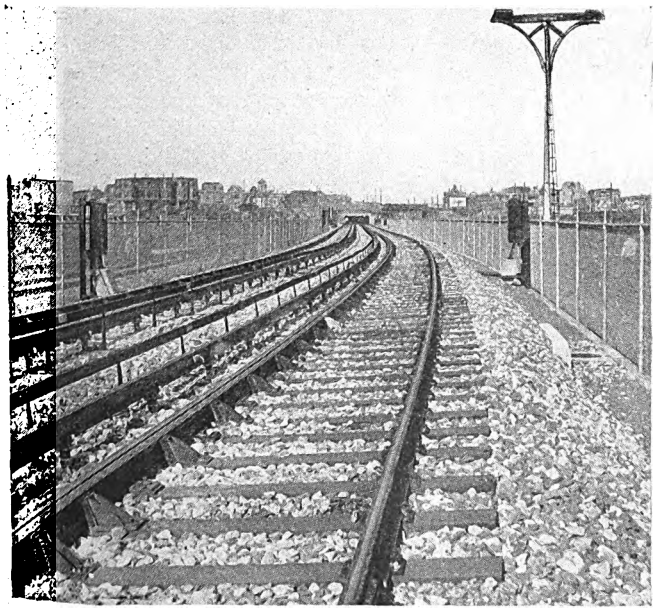
The act provided that the extension of the Dorchester Tunnel was to be equipped by the railway in the same manner as all subways and tunnels previously built and leased. For the balance of the Dorchester rapid transit extension the equipment, except rolling stock, was to be provided by the city. By mutual agreement it was decided that all connections with the rapid transit extension occurring within public highways were to be installed and owned by the railway. These connections included trolley tracks, special work, trolley wire, poles, feeders, conduits, etc.

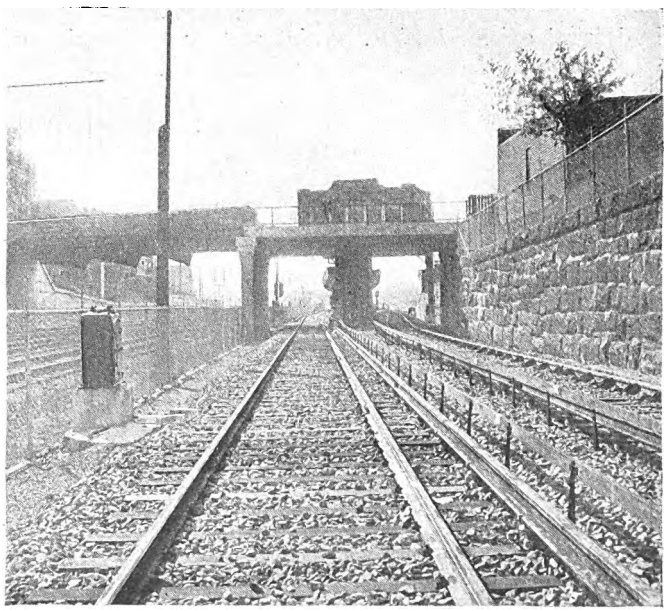
When it came to the proposition of building tracks and installing signal and power apparatus, the Transit Department felt that this work could be done best by the Boston Elevated Railway, as that company had much greater experience than any available contractor. The act provided that the work could be let without competitive bids and a contract was made with the railway covering the installation at cost plus an allowance of not more than 10 per cent for engineering, overhead, etc.

Track Is Solidly Constructed

Material required to equip the extension from Andrew Square to Fields Corner included 29,016 tons of ballast, 14,229 6x8-in. hard pine ties, 58,269 ft. of 85-lb. A.S.C.E. rail for the track and 24,874 ft. of the same section for the third rail, 14,000 ft. of special guard rail, 74,369 screw spikes, 20,626 tie plates and 60,250 malleable castings.

The track is constructed according to the Boston Elevated Railway standard for third rail operation. The running rails are mounted on rolled steel tie plates and





At left, section of track south of Cambridge-Dorchester tunnel. At right, approach to Savin Hill station, showing headhouse on the viaduct. Tracks of the N. Y., N. H. & H. R.R. are on the left

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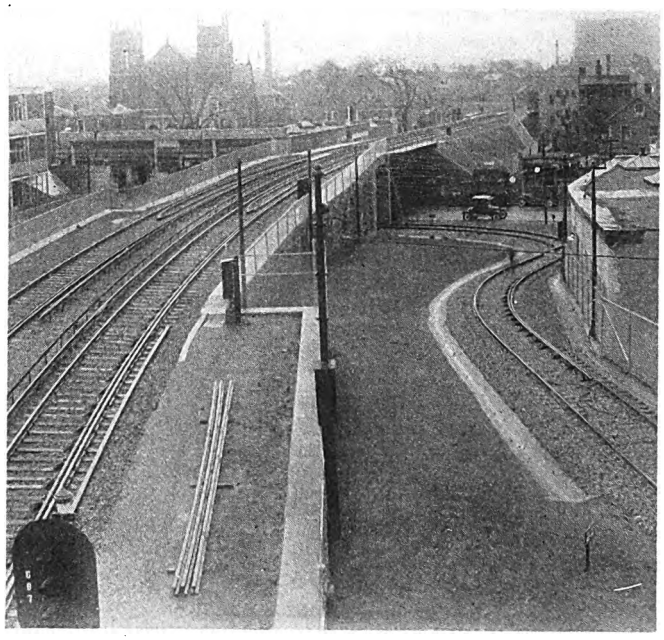
fastened to the wood ties with screw spikes. The ballast is crushed stone. The third rail is of the same section as the running rail but is rolled under different chemical specification. All curves are protected with Boston Elevated Railway special guard rail, and in addition a safety guard is placed on all fills and on all bridges.

The tracks are on 13-ft. centers on tangents and slightly more on curves, leaving on either side within the 35-ft. right-of-way ample room for signals, conduits, etc. The roadbed or sub-grade was first rolled with a steam roller and the ballast up to the bottom of the ties was delivered by motor truck. The minimum depth of the ballast under the ties is approximately 12 in. The ties are 8 ft. and 9 ft. 3 in. in length, spaced on approximately 2-ft. centers, the longer ties being used for supporting the third rail.

After the rails and ties were in place ballast for tamping purposes was delivered by car. Compressed air tie tampers were used for surfacing the track. The ballast



Portion of private right-of-way of Dorchester rapid transit extension

is dressed off level with the ties and on the outside of each track it is sloped off to the level of a footwalk about 2 ft. below the top of the rail. This footwalk is approximately 2 ft. in width and dressed off with peastone. It was provided for the safety of inspectors and track walkers. Footwalks are also provided across all bridges. Where the tracks are on a fill the banks are dressed off and seeded in order to improve the appearance and prevent erosion.

The entire line is block signaled, the signals being of the three-colored light type and controlled by alternating-current track circuits. One rail of each track is used for this purpose. There are 30 blocks of an average length of 8,000 ft. Each signal is equipped with an electric automatic stop to prevent a train passing a signal indicating "danger." The temporary interlocking at Fields Corner station is of the electro-pneumatic type with a.c. control. The block signals and interlocking equipment were furnished by the Union Switch & Signal Company.

The entire length of the rapid transit right-of-way is protected by a chain link fence 6 ft. in height topped with three strands of barbed wire in order to prevent trespassers entering the right-of-way and coming in contact with the third rail or trains, which will be operated on frequent headway. To prevent possibility of accidents this fence has been grounded in several places, as anything coming in contact with the third rail and fence would charge the entire fence for a long distance. The length of the fence including both sides, together with auxiliary fences at certain stations, is 32,070 ft. and it was necessary to provide 3,207 foundations with a concrete beam between foundations, requiring a total of approximately 2,000 cu.yd. of concrete.

Stations

The contracts for the passenger stations were let separately from the contracts for the right-of-way. The equipment of the stations will be provided jointly by the Transit Department and the Boston Elevated Railway. The passenger stations at Columbia Road and Savin Hill are way stations of the island type. Taking into consideration that they are out-of-door stations, they approximate as nearly as possible the best type of subway or underground station. The construction is substantial and entirely fireproof.

At each station the entrance building or headhouse is located on the sidewalk level at the intown end of the station. The headhouse is provided with wide doorways leading into an area where there is located the apparatus for collecting fares, making change, exit turnstiles, etc. Beyond the fare collecting barrier a double flight of stairs used for entrance and exit lead to the platform below. Under the stairs suitable toilets, closets, etc., are furnished. The platform is located between the tracks and is constructed of reinforced concrete. A canopy covers its entire length and is slightly higher than the roofs of the cars. The stations are 300 ft. long and provisions have been made for a future extension of 135 ft. to allow for the operation of six-car trains.

Fields Corner station, the third on the extension, is 2.4 miles from Andrew Square and will be the temporary terminus of the rapid transit trains pending the completion of the extension and terminal at Ashmont. At this location the Transit Department and the Boston Elevated Railway have developed a modern station and terminal for the interchange of passengers between rapid transit trains, trolley cars and buses. This station, with approaches, covers an area of 6.8 acres and is located a short distance north of the railway's building, carhouse and yard. The layout is an improvement over the older type of terminal in that it provides for direct interchange of passengers between trolley cars and rapid transit trains on the same level. The trolley cars reach the upper level by inclines having a grade of not more than 5 per cent.

The platforms are covered by a building 300 ft. in length by 135 ft. in width of steel and reinforced concrete construction with a steel and wood roof. The rapid transit platforms are long enough at the present time to accommodate four-car trains, but provision has been made for extending the platforms 135 ft. when six-car trains are operated.

The rapid transit tracks pass through the approximate center of the station with platforms on either side. There are two tracks for trolley cars on the outbound platform and one track on the inbound platform paralleling the rapid transit tracks and flush with the platforms.

The platform between the trolley cars and rapid transit track is 33 ft. in width, divided into two parts. The "pay-leave" area holds four cars where trolley car

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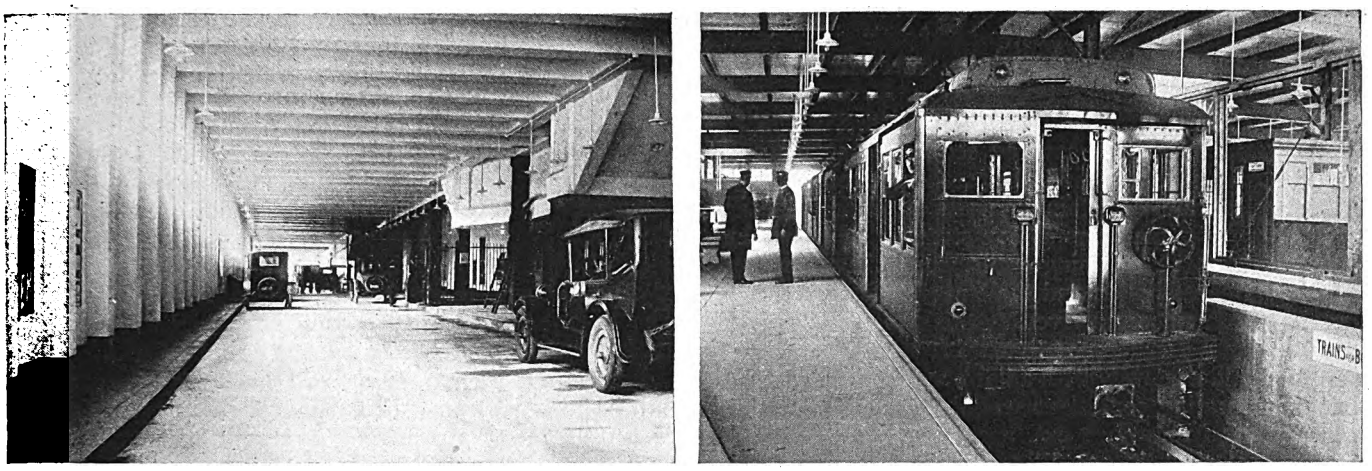


Fields Corner transfer station for connecting lines. Illustration at left shows the bus and street passageway

passengers not having previously paid their fares will do so before entering the rapid transit platform. A "pay-enter" area for three cars is provided for the convenience of passengers who have previously paid their fares and wish to continue their journey on the trolley cars.

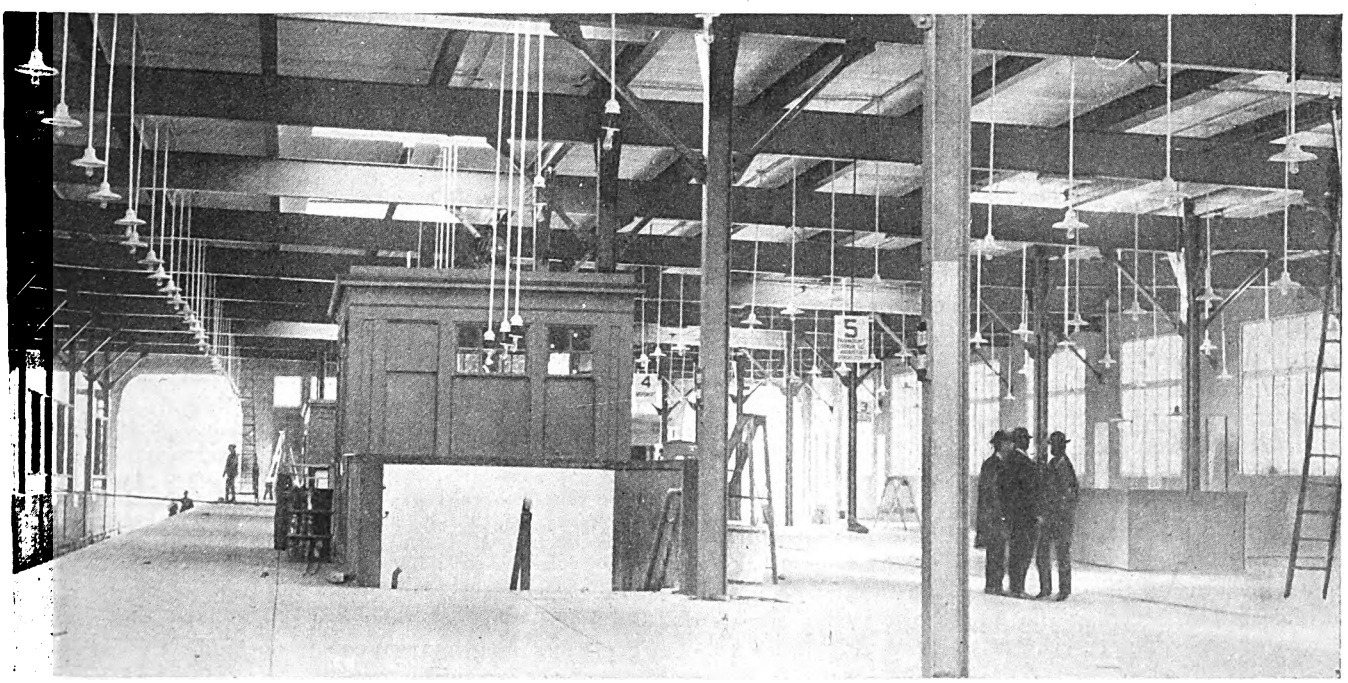
There is a 20-ft. busway through the station at the street level. Buses enter from the Dorchester Avenue side and pass out of the station at Geneva Avenue. The bus platform is 14 ft. in width and is divided transversely into two parts. The "pay-leave" area has a capacity of six buses. Passengers leave the buses here, pass through a barrier and pay their fare before entering the station to take either the trolley cars or rapid transit trains. The buses then make an additional stop in the "pay-enter" area, holding six buses, where passengers who have previously paid their fares take the buses.

Entrances and exits are provided at the street level. The main fare-collecting unit is located on the upper level between the inbound rapid transit tracks and the surface tracks. Fare collecting units are also located on the bus platform at the Charles Street entrance to the station. A total of eleven General Electric automatic passimeters and five Langslow passimeters are used in the various fare-collecting units.

The color scheme of the station differs from that used in the subway tunnel stations, where the trim around the white tile or plaster walls is a different color at each station. At all three stations the color of the roof supports, waiting rooms, booths, etc., is green, stippled with black, which is very effective.

Between the area occupied by the rapid transit station and the railway's property was a tract of land of sufficient size to permit the erection of a 100-car bus garage. At the request of the railway the Transit Department purchased this property, which with the rapid transit station and the railway's property gives an area of approximately 10 acres and provides for a complete operating plant of rapid transit trains, trolley cars and buses. The site for the bus garage is now being prepared; not all of the buildings have as yet been removed. One unit will be built at this time having an open floor area of 20,000 sq.ft. with a capacity of 56 buses. A central heating plant is also to be installed for heating the garage and waiting rooms in the station.

South of Fields Corner station the tracks extend for a sufficient distance to provide storage yard and operating tracks. A temporary double crossover has been installed for turning back trains. The crossover with



Transfer platform of Fields Corner station. Fences and passimeters will insure payment of rapid transit fares

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necessary signals for governing the train movements will be controlled from an electro-pneumatic interlocking plant located in a temporary wooden tower just south of the station.

Between Park Street and Peabody Square, a distance of 4,150 ft., there is a covered section or subway. It was first intended to build this section in an open cut providing substantial retaining walls on either side and abolishing grade crossings at five streets. It was found, however, that the retaining walls would have to be of very heavy construction and the Transit Department and the railway engineers arrived at the same conclusion at practically the same time; that is, it would be fully as cheap to build a subway with a light roof construction and that the operating conditions would be much better in a subway than in an open cut, particularly on account of the probability of the cut filling with snow during heavy storms.

Shawmut station, 3.06 miles from Andrew Square, between Mather Street and Centre Street, will be of the subway type with separate platforms for each track; the platforms will be 435 ft. in length by 12 ft. wide. In this case it was found advisable to build the platform for the length necessary for six-car trains, but only 300 ft., to accommodate four-car trains, will be equipped. The entrance building or headhouse will be located in the covered section over the station platforms.

Ashmont terminal, 3.6 miles from Andrew Square, will be located just south of Peabody Square at the approximate location of the Ashmont station of the New Haven Railroad and will be the terminal for rapid transit trains and high-speed trolley line from Mattapan and Milton. There will also be local trolley track connections as well as ample capacity for buses.

The Ashmont terminal will also be of the one level type, in so far as trolley cars and rapid transit trains are concerned, the platforms between them being at the same level. The building covering the station platforms will be 300 ft. in length by 166 ft. in width, constructed of reinforced concrete, with roof of steel and wood. As at Fields Corner, the rapid transit tracks pass through approximately the center of the station, the tracks being about 4 ft. below the platform level.

All trolley cars enter the station from the south of the station building, passing over the rapid transit tracks on a concrete viaduct. There is one in-town trolley track next to the east wall of the station, having a capacity of six cars. Between this track and the in-town rapid transit track is a platform 30 ft. in width, where the main fare-collecting unit will be located.

After discharging passengers, the trolley cars will pass out of the station and over the rapid transit tracks by means of a concrete viaduct north of the station building and re-enter the station on the west side, where there are three tracks, having a total capacity of fifteen trolley cars, with ample platform between the outbound rapid transit track and the nearest trolley track and suitable platforms between each pair of trolley tracks. Cars that enter the station from the south may proceed north on Dorchester Avenue, without returning through the station.

The high-speed trolley cars will enter the station from the south on the in-town track previously described, and these cars will return over the reverse route as described above, picking up their passengers on the outbound side of the station, reaching the high-speed trolley track by means of the concrete viaduct south of the station previously described.

At this station the busway is located at approximately the same height as the roof covering the platforms. In designing the station the Transit Department took advantage of the fact that rapid transit tracks are considerably below the level of Dorchester Avenue and Peabody Square. The buses will enter the station from Dorchester Avenue on a slight upgrade, reaching the bus platform which is parallel to the rapid transit tracks. The total length of the bus platform is 330 ft. x 12 ft. wide. The busway itself is 20 ft. wide, and has a capacity of eleven buses on the loading and unloading platforms. The buses will leave the station on a slight descending grade, reaching Dorchester Avenue near Peabody Square.

Passengers leaving buses will have ready access to either the rapid transit or trolley car platform by means of a passageway at the roof level and stairways to the platforms. Fares will be collected at the entrance to this passageway.

It is anticipated that the number of movements of rapid transit trains, trolley cars and buses at this terminal when the entire extension is in full operation will be equal to if not in excess of the total car movements at Park Street station in the Tremont Street subway.

South of Ashmont terminal bordering on Codman Street there will be provided a rapid transit yard containing eight tracks and a loop which will accommodate 90 Cambridge subway cars. The yard is sufficient to provide an ultimate storage for 206 cars along with a suitable repair shop.

"Ask Me Another," as Practiced in Fort Worth, Tex.

INTERESTING transportation points are brought to the attention of the trainmen of the Northern Texas Traction Company, Fort Worth, Tex., by a novel method, which is mentioned in the company's brief for the 1927 Coffin Prize. The method is known as the "Question Board."

Each week a question dealing with some phase of the company's business is posted on a bulletin board in the trainmen's clubroom. A prize of $1 is given to the man getting closest to the correct answer. It is felt that the offer of some prize like this, even if nominal in amount, adds to the interest taken in the competition.

A typical question, posted on April 21, with the way in which it was asked, follows:

How much time, in minutes, is consumed in the proper adjustment of race signs in a car in a run of ten (10) round trips on Arlington Heights?

A dollar bill will be given the operator who furnishes the nearest correct answer.

Arlington Heights operators and extra men operating Arlington Heights cars between this date, April 21, and Sunday, April 24, please answer.

The method of posting the correct answers may be illustrated by those received to the question just given. This competition closed on April 24 and the result, which was posted April 25, read as follows:

The following answers were received to the question of "How much time is consumed in the proper adjustment of race signs on Arlington Heights, in making ten (10) round trips?

The time consumed was 290 seconds by an actual check made with a stop watch for ten (10) round trips. Operators D. B. Stanley and J. R. Brown turned in the nearest correct answers of 300 seconds each and are the winners of the prizes.

In cases where the replies received bring the correct solution to some debatable question of operation, bulletins of greater length are posted, outlining the company's future policy in this respect.

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Logical Valuation for the Utilities

Cost of reproduction is recognized by the Supreme Court as present value and should be accepted by commissions. Valuations, when required, should be made by commission staff

By William A. Prendergast

Chairman of the Public Service Commission of the State of New York

Speaking before the annual convention of the National Association of Railroad and Utilities Commissioners held at Dallas, Tex., Oct. 17-21, Mr. Prendergast made an able plea for the uniform valuation of utilities, even if state legislation is necessary to authorize it. The address, here presented in abstract, is an able treatment of the subject and merits careful attention of every one interested in valuation and rate problems.—EDITOR.

HAS the regulatory concept justified itself? The friends of regulation of public utilities are able to offer many cogent arguments in its support in the form of accomplished acts. In fact, it is easily possible to prove that the system has decided advantages over any methods that were ever followed before state regulation was introduced. But there are undoubtedly some shadows in the picture. It will be useless for the advocates of regulation to deny this. It may be said that there are two very deep shadows at the present time. One is the jurisdictional authority of the Interstate Commerce Commission, conflicting as it frequently does with state authority. The other is the failure on the part of the state commission to have developed a definite policy in respect to the principles of valuation of public utility properties. Critics of regulation go so far as to say that the disagreements regarding principles of valuation at the present time may wreck the future of the regulatory system, and that there are serious limits to the extent to which regulation is itself effective. It is to the second of these propositions that this paper will be addressed.

Let us examine the question fairly and discuss it with candor. It is twenty years since state regulatory laws established commissions with considerable and broad powers over the conduct of public utility business. Now in the earlier years of commission regulation the problem of valuation was not a serious one. In the beginning the two important things these state commissions were supposed to do were to control properly the issues of securities to prevent stock watering and reduce the rates charged by public utilities. The reduction of rates was accomplished in many cases prior to the Great War without recourse to any very well-defined valuation of the properties. It was not until the war reaction toward high price levels, accompanied by the desperate resistance of these demands by municipalities and citizen organizations, that the question of valuation commenced to loom large and the great importance of the question in the structure of rate making made itself evident. Simultaneously there came the assertion by utilities of their right to a full recognition of the value of their properties, and the equally insistent effort of the representatives of the localities to secure the lowest possible basis of valuation.

The commissions have attempted to deal fairly and justly in this tense and litigious situation, but their decisions have indicated a noticeable effort to establish the lowest possible measure of valuation, often unsustained by evidence, and in many cases unsupported by arguments of a convincing character. The natural result has been appeals to the courts, reversals of commission determinations and much public disapprobation.

The wide divergence of opinion upon this question of valuation which is manifested in commission decisions certainly affords inspiration to the critical instinct. The question therefore arises, Does this problem of valuation endanger the stability of our present regulatory system? Have the commissions grappled with the valuation problem fundamentally? Many decisions indicate a genuinely studious effort to find a solution of this problem, but it is also true that a similar number seemingly manifest an effort to avoid a declaration of definite principles. It is also true that even when faced by adverse court decisions commissions seem to make an effort to avoid the full implication of the court's fiat and incline toward a standard of valuation which will arouse the least possible adverse political comment.

JUSTIFICATION FOR PAST POLICIES OF COMMISSIONS

Much may be said—and with good reason—in support of the idea that it may not have been wise for the commissions at a too early stage to attempt to enunciate conclusive doctrines, and in the period from 1918 to 1922 such a policy may have been justifiable. At the present time, however, and for the past four years at least, the economic situation has been such that, with all reasonable conjectures as to immediate future happenings, we can definitely state that we have passed from the stage of the speculative into the stable, with the resulting responsibility of better defined or more settled judgments on questions affecting the course of regulation. I do not mean to imply that the past ten years have been barren of consideration of the different elements of the valuation problem. Decisions contain many references to "original cost" and "reproduction cost," but these discussions are finally enveloped in a mist of indecisive rhetoric which even the courts cannot unveil. During the post-war period there have been a number of court decisions, the trend of which has been strongly in the direction of recognition of so-called "reproduction cost" as a determining element in the ascertainment of "present value." This has been enunciated by the Supreme Court of the United States. While there was a check to the general acceptance of this doctrine, indicated by the decision in the Georgia Railway & Power Company decision, it may be said to have been removed by the McCardle decision.

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Are we not now at that turn in the road where the utility commissions must decide (1) to accept what the courts have decreed, or (2) to seek legislation from their states to establish the principles they should follow, or (3) to agree upon some definite policy of their own? The first suggestion—to abide by the rulings of the United States Supreme Court—is, of course, the path of least resistance; the second—to have recourse to a legislative edict on the subject—is, in my opinion, inexpedient for reasons which I will state later; the third—that the commissions seek to find a conservative and fair policy of their own which will square with the legal principles as enunciated by the courts—seems to be a duty which the commissions ought to assume without hesitation or evasion.

It is during the past ten years that rate proceedings have assumed a new significance in our economic life. Perhaps the utilities have taken a too aggressive attitude in the trial of rate cases and should have exhibited a greater disposition not to insist upon their rights under the law, especially with respect to the fixation of a fair value of their properties. But they have, and it is this very insistence which gives us our valuation problem today.

It might serve a useful purpose to inquire as to whether the utilities have not been forced into their position by the extreme course taken by public authorities, especially those representing certain municipalities. There are cases without number which could have been speedily settled by commissions without protracted proceedings if it had not been for the unreasonable attitude of representatives of the public. The consequence has been that these cases have had to proceed to a determination with the finding of valuation figures inuring to the advantage of the utility and the embarrassment of the municipalities.

In cases where the utilities have objected to the findings of the commissions the courts have by their rulings established precepts of valuation which stand as a protection to the utilities in the future. We have therefore had an economic battle between utilities and commissions, the net gains of which up to this time have been on the side of the utilities. I assert that much of this would have been avoided if municipalities had taken a reasonable stand, and if public officials had not frequently sacrified public funds and public time in order to enhance their own political prestige. At the risk of repetition, may I say that the public has lost by this policy, because rates have been advanced and valuation principles established by the courts in a manner which has immeasurably strengthened the utilities.

Attacks on "Reproduction Cost" Theory

We have now reached a period in regulation where valuation has become a potential issue, with the "reproduction theory" as the chief point of attack, this being due, and very naturally, to the fact already noted that the trend of judicial sanction has been in that direction. The reproduction theory if followed will in nearly all cases produce a high valuation. It therefore invites the opposition of representatives of municipalities and civic organizations. They are against it for this reason. The merits of the subject, whatever they may be, have little influence upon the ideas of these public officials. Some alternative suggestions to the "reproduction theory" are advanced with great persuasiveness and force by critics of this doctrine.

The dissenting opinion of Mr. Justice Brandeis, concurred in by Mr. Justice Holmes, in the Southwestern Bell Telephone case advocates "prudent investment." At the same time one cannot help believing that under this subtle title there rests contentedly our old friend "original cost." To argue with Justice Brandeis' opinion would be presumptuous, but it must be said that no court has yet upheld the theory or directed its application to any particular case. It is also worthy of note that in his dissenting opinion in the McCardle case, concurred in by Mr. Justice Stone, Mr. Justice Brandeis says little concerning "prudent investment" and devotes his attention to the idea that "the estimate (of value) to be in any way worthy of trust must be based on a consideration of the varying costs of labor, materials and money for a period of at least as long as would be required to construct the plant and put it into operation," and again he says, "but where a plant would require years for completion the estimate would be necessarily delusive if it were based on 'spot' prices of labor, materials and money."

Worcester Case Repudiates Reproduction Basis

Quite recently we have read a determination of the Massachusetts Department of Public Utilities in the case of Customers vs. Worcester Electric Light Company. This was widely spoken of as a repudiation of the reproduction cost theory as expounded by the Supreme Court of the United States and a reassertion as well as a vindication of "prudent investment." I think it is very material in our present discussion.

There are four recorded opinions in the case. They furnish figures respecting value all the way from an assessed valuation of $4,571,200 up to a reproduction cost claimed by the company, less depreciation and including overheads, totaling $17,837,000. The value of the property was fixed by the commission at not to exceed $10,000,000. In a spirit of inquiry or curiosity it would be consoling to know just how that value was determined. Why does $10,000,000 mark "prudent investment?" The principal opinion states that the value is based on the McCardle case and other recent decisions of the Supreme Court, though how it does so is not clearly stated.

If "prudent investment" possesses those merits which have been claimed it should be something that may easily be understood and defined. If one has to take an arbitrary figure, the sources of which cannot be discovered from a careful reading of the decision, does the theory give us a simple and stable basis, which its advocates have claimed for it, in determining value of a public utility's property?

Despite the trend toward acceptance of "reproduction cost" in current decisions there are able and alert opponents of the idea. Among the foremost is Dr. John Bauer, whose book "Effective Regulation of Public Utilities" has received wide attention and much deserved praise. In addition to this, Doctor Bauer has furnished us with a number of interesting articles embodying the views expressed in his book. There have also lately appeared a series of articles by the Rev. John A. Ryan, D.D., professor of moral theology and industrial ethics at the Catholic University of America, published in the "Catholic Charities Review," assailing the cost-of-reproduction formula, which for vigor of expression and enunciation of economic principles makes most utterances upon this subject appear like nursery rhymes. Father Ryan denominates the reproduction cost idea as "The New Usury."

Doctor Bauer's Plan

Doctor Bauer does not act only in the capacity of a critic; he presents a plan in the *Harvard Business Review*

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of October, 1926. He admits that the present situation is chaotic, and that if we are to cut our way through the confusion we must place regulation on a definite and workable basis for the future. This means, he says, that we must abandon the "fair value" basis and adopt a definite and determinable basis of rates, which can be readily administered upon undisputed facts without conflict between public and private interests. So far as future investments in property are concerned, Doctor Bauer would frankly base the return on actual investment which can be shown definitely in the accounts, under commission jurisdiction and without any possibility of dispute. As to existing investments, he would start with a definite initial value of existing properties "based upon reasonable considerations of the various conditions and fair treatment of the investors. There would be no general advantage in confiscation, even if that were possible under the Constitution." Dr. Bauer continues:

> My proposal is to start with an appraisal at actual cost of installation and deduct depreciation so as to fix the present net monetary investment in each property. Then this amount should be so adjusted as to meet the requirements of fair treatment. I should urge particularly that an allowance should be made for the common stockholders' investment so as to compensate them for the change in price level since the time their investments were made. While this might be viewed as an element of present reproduction cost, it would be allowed on the grounds of equitable treatment. It would not be applied, however, to the entire property, for the bondholders and preferred stock holders would be contractually limited to the stipulated interest and dividend rights as fixed by the securities issued. Even if such an adjustment were made upon their investment, they would not obtain the benefit, so that there is no demand in fairness for such an allowance. . . .
>
> In any event, I should urge that a final valuation of existing utility properties should be made. Whatever reasonable adjustments in any respect may seem desirable and just in any case, they should be made once for all and then incorporated in a fixed sum for the future. This final amount should be fair, but should not be subject to future reconsideration, and this fact itself should be duly considered in view of fairness. There would be no future changes either on account of price levels or shifting conditions of operation. . . .
>
> To this initial valuation, as entered into the accounts, would be added all future additional investments in improvements and extensions. These would all be entered in the accounts at actual cost under commission supervision. All the properties, those included in the initial valuation as well as subsequent additions, would be fully maintained through repairs and provisions for depreciation and renewals. The rate base at any time would consist of the original cost of the properties as shown by the accounts, less the depreciation reserve. . . .

Father Ryan gives his approval generally to the plan proposed by Dr. Bauer, adding, however, "another method of giving the stockholders some increase in valuation is to allow them the full advance that has occurred in that portion of their property which consists of land" and, again, "still another method would be to allow a higher rate of return on stock which was issued before the great rise in prices than on later issues. Instead of an increase in valuation there would be an increase in the rate of interest. On its face, however, this method seems to be less practicable than the other two."

Why Use Reproduction Theory in Part Only?

Both critics whom I have cited concede that there are certain circumstances under which the present cost of production, or reproduction cost, should be recognized.

It is admitted that there are certain conditions under which present cost should be applied, but confined to only a part of the property. Why a part? To whom does the property belong? There is no legal division of interest or title. Certain securities the company has issued have a definite preferential status. But the title to the property is in the company, and the common stock holders own the company. If they have preferred to borrow money on bonds and mortgage their property it is their affair. Certainly they do not by that act part with their title. The earnings to which their company has a right under the law must come from the property. The manner in which those earnings may be distributed in interest or dividends is the business of the owner, subject to such obligations as he may have imposed upon himself. So that, without entering into a prolonged discussion on this point, it would seem to resolve itself into this—that the common stock holders are entitled to have their investment recognized on a reproduction-cost basis. If this basis should apply to that portion of the property represented by their investment, why should not the same basis of valuation apply to the rest of the property? I ask this question because I am not convinced by the arguments used by Father Ryan and Dr. Bauer. It also seems to me that their support of the reproduction theory only in part is a significant development in the general discussion.

It may be superfluous to say that the decision of the Supreme Court of the United States in the Indianapolis Water Company case has been epochal in the history of regulation. While other decisions have indicated a certain trend of opinion in the direction of reproduction cost as the basis of valuation, this case seems definite on that question. In addition it should be remembered that the court there cited with approval views of the lower courts on the subject, particularly in the New York State $1 gas cases, where strong ground was taken in favor of reproduction cost, observed depreciation, a relatively high rate of return, and going value. Reference is made to the case only to emphasize the statement heretofore made that it is now time for commissions to adopt and follow some well-considered procedure in order, if possible, to remove this question of valuation from the domain of political debate.

Commissions Should Settle the Question

It is my opinion that the duty is now imposed upon the commissions to do this thing and that the National Association of Railroad and Utilities Commissioners should assume leadership in the undertaking. If it is not done there is the greatest danger that the subject will be made a political issue, with results that no candid student of regulation believes will be determining, and which will undoubtedly lead to greater confusion. If this question becomes a purely political one it will surely be presented to the legislatures of the states for settlement and we will have political judgment upon economic questions.

I offer this criticism of legislative dictum on a subject of this character because I do not believe that it can ever receive the necessary study from the legislative bodies, and we must all recognize the fact that the political instinct would prove the chief motivation in any decision which legislative bodies will render. This has been the result of such efforts throughout the entire history of the regulative theory.

It would, in my opinion, prove a great public boon if there were a general agreement among utility commissioners in respect to the treatment of valuation. Is it possible to accomplish this? The courts have prescribed certain principles, but this does not mean that a reasonable formula for the execution of those principles would not meet with general public acceptance and be sustained by the courts. There is no disagreement, or should be none, that it is the present fair value of the properties that is

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to be determined; that is, a fair value as of the time of the proceeding, or, if it were possible to make a valuation of all utilities, this value should be determined as of the time when it is made. How can present value be determined except by present prices, subject, of course, to the depreciation in the property; this to be fixed by competent examination? A new economic age has arrived. Let us consider our present problems in the light of present conditions.

I am inclined to believe that the main difficulty in arriving at a satisfactory basis for determining the "present fair value" of a property arises from the fact that in many cases the overheads and going values claimed by the companies are from any reasonable viewpoint generally claimed on a basis which is grossly excessive. It may be well within the facts to say that the size of such claimed values has done much to arouse opposition to the reproduction-cost theory. But these issues are susceptible of fair and adequate treatment. If these claims are considered by the commissions in the light of reasonableness and reduced to their proper size, and the decision fortified by convincing arguments, it is almost certain that the view of the commission will be sustained by the courts. Most of the reversals arise from the fact that these issues are either ignored or, if recognized, given a consideration which is manifestly inadequate.

Ideal State of Regulation

The ideal state of regulation would be the establishment of valuations for all companies with the necessary modifications of additions and withdrawals from time to time. In this way there would be a rate base which would be a continuing basis for such changes in rates as conditions warranted. Viewed from a practical standpoint, the task seems most difficult. But at the same time it is in my judgment one of the chief functions of regulation and therefore a problem which should be mastered.

People generally suppose that with reports filed annually by the utilities it is simply a question of consulting these reports in order to fix rates. But the obstacle is that the fixed property values appearing on the books do not reflect the actual present values of the properties and for that reason the reports do not serve the required purposes.

Shall there be undertaken a complete appraisal of all the properties of all the utilities excepting interstate railroads? This will require an immense expenditure. Will the states burden themselves with this expense? I could quote some instances which would discourage the mere suggestion of their doing so. If the work is to be undertaken it would have to be done by the commissions through their own staffs, as the valuation of the railroads has been and is being done by the Interstate Commerce Commission. I wish to point out that this would be necessary because I fear that there would be a demand on the part of the localities that they should participate in the work. This would undoubtedly then take the form of a valuation proceeding, with the consequent loss of time, which would be ruinous to the enterprise. Legislative sanction would be required for this work and this would invite the problem of a legislative program of the principles on which the valuations should be based. I believe, however, that as a preliminary to any policy on this subject it is important that in every rate proceeding the commission should find a valuation. This being done, at least a beginning will be made in having the necessary data on which required changes may be based.

Many Ride-Selling Ideas Developed on Northern Texas Traction

MANY ride-selling ideas have been developed in the past year by the Northern Texas Traction Company, Fort Worth, Tex. Several of a novel type were described on page 845 of the issue of this paper for Nov. 6, 1926. Others developed during the past year and mentioned in the company's brief for the 1927 Coffin Prize are given below:

An arrangement has been made for display advertisements on the paper laundry bags used by the Adolphus Hotel, Dallas. The advertisement shows a view in color of the company's "Crimson Limited," which runs between Dallas and Fort Worth. This kind of display advertising is considered favorably because it reaches the stranger in town who may not be as well acquainted as the residents of Dallas with the excellence of this interurban service.

A large display sign has been placed on a building which the company owns in Dallas so that there is no cost except that of placing and maintaining the advertisement on the sign.

The company arranged with a local paper in Fort Worth to publish a blank map of the city for seven consecutive days. Surrounding this map were advertisements of various business concerns. A prize was offered to the person who would come nearest in tracing the car lines on the map and fixing the locations of the business concerns advertising in connection with the contest. The plan served to familiarize a large number of people with the routes of all of the more important lines.

Arrangements were made with a large department store by which it offered free rides homeward on April 30, 1927, to all who would call at one of the stores for tickets. This offer was coupled with a special sale made by the store on that day. It must have proved satisfactory to the merchant because it is the fifth time that he has made such an arrangement with the railway company. The latter has offered a similar arrangement with any other department store.

Considerable advertising is done by radio as the company puts on a program for an hour every two weeks at a local broadcasting station. It is also an extensive advertiser in the daily newspapers, uses the backs of theater tickets to some extent, and employs poster and sign advertising.

Auto Bus Transportation Occupies Important Position in Minnesota

INDICATION of the extent to which auto bus transportation has taken hold in Minnesota is given in the annual report of the Minnesota Railroad and Warehouse Commission, which states that in 1926 auto transportation companies accommodated more than 12,000,000 passengers and collected $4,627,000 for services rendered. A total of 402 vehicles, of which only 119 were confined to local transportation, operate on 4,870 miles of roads throughout the state, which have been assigned by the commission. In addition to the transportation service rendered by the buses, their operation has benefited the state in the amount of $219,000 paid for vehicle licenses and $64,000 for gasoline tax.

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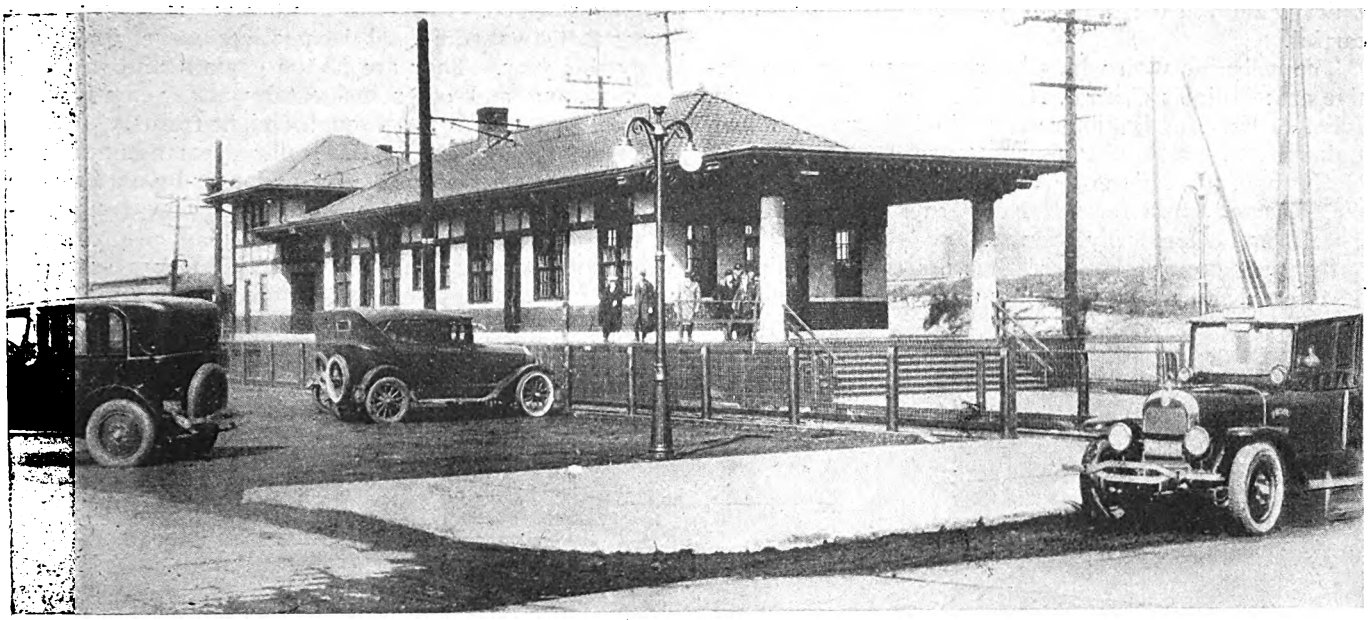

This handsome passenger station at Gary, Ind., has been erected by the present management to replace a small brick structure

Good Service Has Paid

on the South Shore Line

A rapid and reliable freight service has brought patronage and will be supplemented by motor tractors and flat cars for sections not reached by the railroad. Aggressive merchandising methods adopted

IN THE issue of Nov. 5 some particulars were given of the notable rehabilitation of the Chicago, South Shore & South Bend Railroad under its present owner, the Midland Utilities Company, which has had the property for only about two years. New equipment has been introduced and the public has promptly responded in patronage to the better service given. The previous article was devoted largely to the changes made in the passenger service and equipment, including the introduction of a co-ordinated motor coach transportation system. Other noteworthy features are the changes made in the freight service, the method of advertising the facilities afforded and the engineering improvements not mentioned in the previous article. This information, like that in the previous article, is abstracted from a brief which the company presented in the competition for the Coffin Prize in 1927.

Improved Freight Service Given

One of the first steps taken by the new management to build up the South Shore Line was the establishment of a fast and reliable freight service. Reference was made in the previous article to an overnight less-than-carload service which was begun between Chicago and the cities served by the South Shore Line. This was one of the first things done. Commodities delivered to the railroad in Chicago in the afternoon were hauled ready for pick-up at their destination the following morning. The plan was so successful that this service has been extended to include cities on adjacent electric lines. It has proved popular, as well as profitable.

Seven receiving stations for less-than-carload freight have been established in the heavy shipping sections of Chicago, providing a most convenient form of service for shippers. Freight delivered to these stations is carried to the railroad by tractors and trailers. These seven stations are used jointly with two other electrically operated railroads in Chicago, thereby reducing the overhead for each line and providing a convenient local point for shippers' trucks with material to be shipped north, west or east.

An aggressive policy governing the handling of carload freight was instituted by the South Shore Line's new management. Due to the industrial nature of a major portion of the cities served, it was recognized that this branch of operation could be developed into an important revenue producer.

New and improved interchange tracks have been built with nine steam railroads and one electrically operated railroad. Through rates to the eastern and western seaboards were established, making possible the handling of carload freight originating on Eastern lines for

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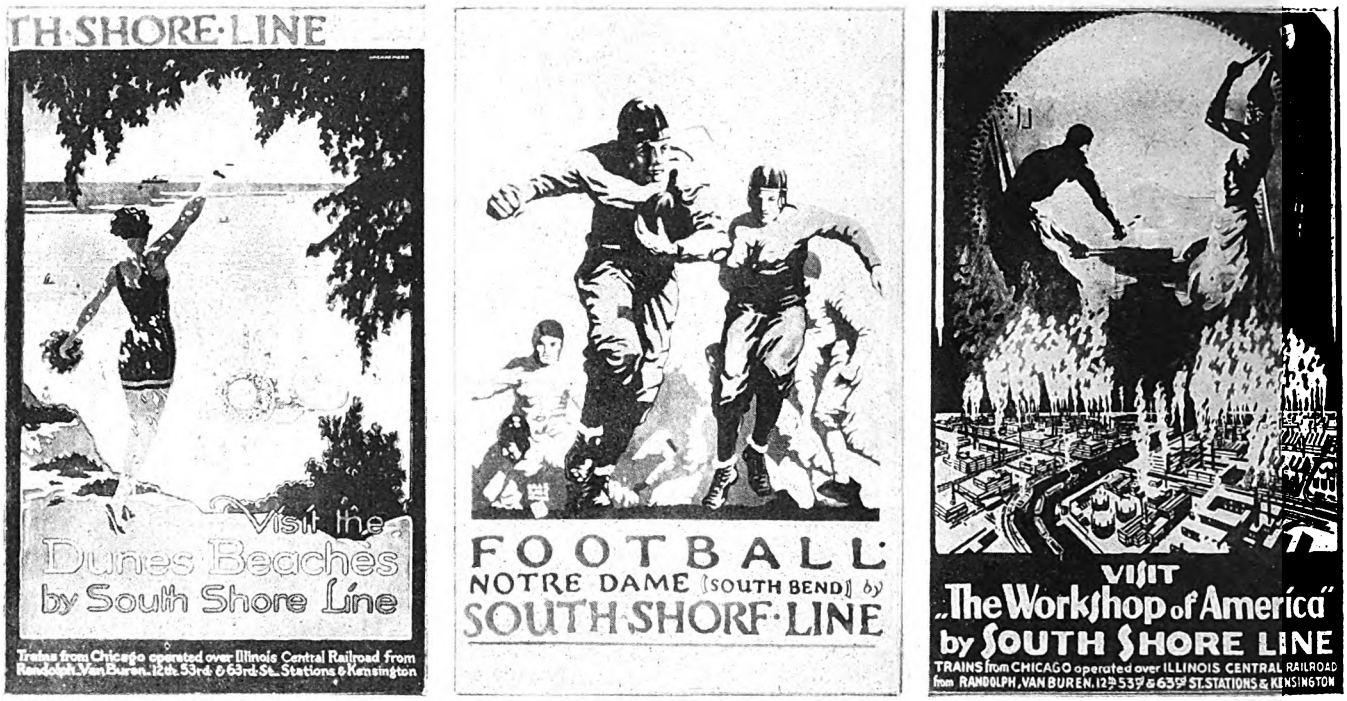
Chicago and the West, and vice versa, as an intermediate carrier.

The railroads with which interchanges are now opertive are: Illinois Central, Nickel Plate, Wabash, Elgin, Joliet & Eastern, Baltimore & Ohio Chicago Terminal, Indiana Harbor Belt, Pullman Railroad, Belt Railroad of Chicago, the Chicago & Calumet River Railroad and the Chicago, South Bend & Northern Indiana Railroad. The latter is electrically operated.

By using the South Shore Line, interchange shippers have found that at least 24 hours can be saved in delivery in August, 1926. Freight traffic became so heavy, however, that two additional locomotives were purchased early this year. They are 53-ton engines and are used in switching and other incidental work, releasing the heavier locomotives for through freight trains.

Upon investigation by the traffic department, it was found that Kalamazoo, Mich., and near-by cities were without adequate overnight freight service from Chicago, and that the South Shore Line, in co-ordination with motor trucks, could provide it. After a survey it was inaugurated and during the three or four months it



The South Shore Line has published some very handsome posters. These give an idea of the variety of the places served

time, either to eastern or western points. This is made possible through the fact that on the South Shore Line high-speed service is available and the badly congested freight classification yards around Chicago are avoided.

Every effort is made to insure reliability in the railroad's freight service. Speed is one of the governing factors and the carrying out of promises another. In cases of emergency especially fast shipments have been made, resulting in wholly satisfied and oft-repeating customers.

New Freight Equipment Ordered

Equipment which will make possible a wider extension of merchandise service by the railroad has been ordered and is now being built under new patents and will be delivered shortly. It consists of gasoline-driven tractors, trailers and specially designed flat cars. The trailers can be loaded at some distance from the railroad, hauled to freight stations, run onto the flat cars, where they are anchored, and carried to any point on the line. At these points they will be attached to other tractors and hauled to their destination. Through the use of this new equipment, which will go into service immediately upon delivery, the South Shore Line can develop new territory for its freight service many miles off the line.

Four 80-ton locomotives, equipped with four 350-hp. motors each, were purchased at a cost of $218,000 to take care of the freight service. They were placed in service has been in operation has shown substantial monthly gains. Trucks used in this service are owned and operated by a company affiliated with the South Shore Line. They meet the trains at South Bend and transfer the loads of freight.

Merchandising Methods Used by Traffic Department

Modern methods of solicitation and merchandising were adopted immediately upon the acquisition of the line by the present management. An experienced traffic department was organized with separate freight and passenger departments. Tariffs and other files necessary for its efficient conduct were gathered. An extensive personal solicitation campaign was begun with regular calls on shippers in the cities served.

Business was developed along mass lines. Picnics, outings, special movements of lodges, clubs and various other organizations were handled into the Dunes region and to other spots in the territory served. Football games and class reunions at Notre Dame University were profitable from a standpoint of splendid trains.

Traffic solicitors experienced a quick reaction on the part of the public to the improved facilities on the railroad, in both freight and passenger service. Many shippers who had been using their own trucks and trucks of highway shipping organizations changed to the more dependable service of the South Shore Line.

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In passenger service several classes of commutation rates were placed in effect, further stimulating the increase in volume of traffic. Week-end and one-day excursion rates were also placed in effect for mass travel on special trains or on holidays.

Function of the advertising and publicity departments has been most extensive, due to the railroad's policy, consistently applied, of telling the public of the new order of things. Trained advertising and newspaper men are in charge of this branch of the company's organization.

As each step in advance in the railroad's improvements was completed many columns of newspaper space, both in paid advertising and in the news columns, resulted. A systematic campaign of advertising the regular service has been adhered to by this department, with special advertisements for unusual events and changes.

Editors of all papers in the railroad's territory were visited by heads of the publicity department and told of the new aims of the company and of its policy, both as to publicity and operation of the railroad. A policy of co-operation with newspapers was established. In the event of an accident on the line full details are given by the publicity department to the papers in the section affected. This plan has met with approval on the part of the editors and it insures accurate information in the papers, as they have come to depend on the publicity department for their facts.

In cases of development or other news, accurate information is supplied the papers and results in the use of nearly every item. It is a rule that nothing except real news is ever submitted to the newspapers.

Included among the other forms of advertising prepared by this department is a one-sheet lithographed poster, posted each month at the stations on the line and at elevated stations in Chicago.

Poster Wins Merit Award

Three of these posters were accepted for exhibition in the sixth annual Exhibition of Advertising Art in New York City this spring and one of these three was awarded the Art Directors' Club medal and the Barron Collier medal for unusual merit. There were 333 exhibits on display from the most prominent advertisers of the country.

The posters are in attractive colors and picture points of attraction and interest in the territory served by the railroad. They have also met with favor in schools and clubs devoting their study to art.

South Shore Lines, a publication issued for patrons of the railroad, is published every month by the advertising and publicity departments. In it events on the railroad are chronicled, with interesting changes in the company's operation. Each month a story is printed telling of the operation of one of the industries in the territory served by the railroad, resulting in interest on the part of readers, as well as manufacturers. For distribution, it is placed in stations and on cars and a large number are mailed each month to a selected list.

The unique and attractive Indiana Dunes region, at the southern end of Lake Michigan, served by rail almost exclusively by the South Shore Line, has been exploited to a great degree as a site for outings, hikes and picnics by this department. There has been a marked increase in travel to the region as residents of Chicago and other cities served learn of its many beauties. Pamphlets, posters, car cards, newspaper advertisements, special articles in periodicals and many other forms of advertising have been used.

As soon after the line was taken over as work could be started all principal passenger stations were remodeled in order to improve their convenience and comfort. Both exteriors and interiors were made more appealing and inviting by rearrangement and new decorating.

Although it was known by the management that in the near future some of the stations would prove inadequate even after reconstruction, this work was carried out in order that the public might be convinced of the policy of the new management in providing for its comfort.

This artistic poster received medals at the Exhibition of Advertising Art

In May, 1927, one of the finest union rail and motor coach stations in this section of the country was occupied at Michigan City, Ind., by the railroad and its subsidiary, the Shore Line Motor Coach Company. The station, together with an undercover motor coach loading platform and modern garage, represents an expenditure of more than $200,000.

The station proper is a two-story brick, steel and concrete structure. Offices of the operating heads of the coach company and a hall for employees' meetings occupy the second floor. An ornate front of terra cotta, with large plate glass windows and flood and bracket lighting, presents a handsome appearance. The interior is most inviting, with spacious benches and lounging rooms for men and women. Trains stop at the south end of the station and coaches load and unload at the opposite side.

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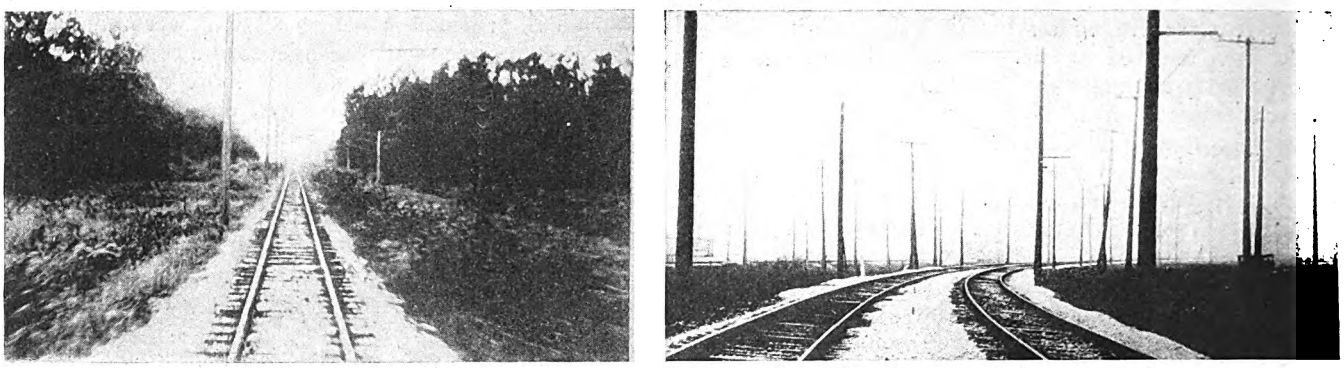


The view at the left shows a portion of the South Shore track at the time of rehabilitation. That at the right a portion of the same section of track as it appears today

In four of the company's principal stations facilities have been provided for the serving of light lunches and other refreshments. This has proved a distinct accommodation to patrons of the railroad. To insure service of the highest standard the railroad operates these concessions. They are most attractive in appearance and are very inviting because of the courteous attendants.

Engineering Features of Rehabilitation

In the engineering studies prior to the adoption of a changeover plan from a.c. to d.c. a great deal of thought was given to economy in operation. The final choice of a 1,500-volt direct-current system was influenced to a large extent by the fact that considerable economy would result. Higher voltages materially reduce power loss, with a minimum expenditure for conversion and distribution systems. The South Shore Line is one of the first railroads of its kind making use of this type of current with multiple-unit equipment.

Following the selection of 1,500-volt direct current the type of conversion equipment which was to be used became the next problem. Considerable attention was also given to various types of this equipment. Rotary converters, which are the standard conversion units used for railroad work, had some disadvantages when adapted to the type of current chosen for the South Shore Line, as it involved the operation of two machines in series. While this had been done in several places and had proved reasonably satisfactory, the fact that a new conversion medium, the mercury-arc rectifier, was beginning to be considered adaptable to railroad work was given careful consideration.

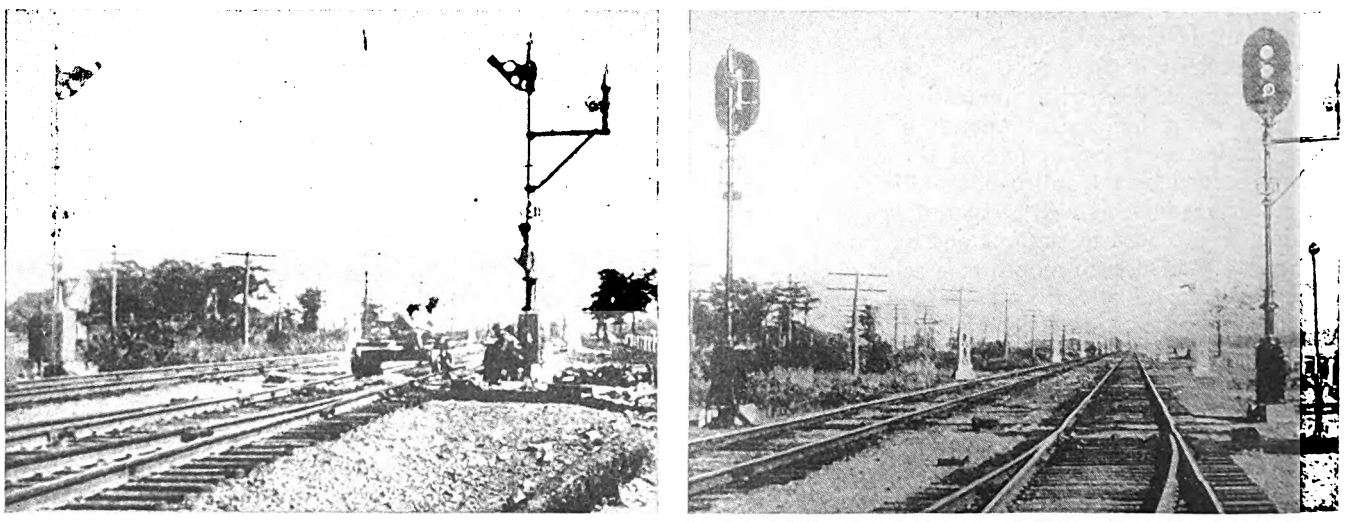
In view of the fact that this new type of converter seemed to offer material saving, due to its higher efficiency, it was decided that the South Shore Line would be justified in making extensive use of this new piece of apparatus. The mercury-arc rectifier was adopted with the realization that the railroad was pioneering, in that it is the first 1,500-volt line in this country on which this type of converting equipment has been installed.

It was also expected by the management that many problems which would require careful co-operation with the manufacturer for solution would also be encountered. One-half of the stations supplying the line were equipped with mercury-arc rectifiers and the entire system from Michigan City to South Bend is entirely dependent upon their successful operation. They were placed in regular service within the last year.

The success in operation of the mercury-arc rectifiers has demonstrated that the faith of the company's engineers has been justified. Many improvements have been made on them within their short life, and it is believed that in the future their performance will more than justify the confidence placed in them.

Automatic Control of Substations

Knowing the progress which has been made in recent years in automatic substations the company's electrical engineers decided to use this type for six of the eight substations which supply the railroad with power. Four



The view at the left illustrates two semaphore type signals formerly in use. These have been replaced with color light signals, as shown in the right hand view

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of these are rotary stations and the use of automatic control for their operation required but little change from facilities used in 600-volt operation. There were a number of problems which had to be solved, however, due to the fact that this was the first railroad using the substations on 1,500-volt operation.

In the effort still further to extend the use of automatic electrical equipment, an automatic supervisory control system was installed. This presented many new problems, as it is the first system of its kind ever applied to a mercury-arc rectifier. In making this installation the management realized that unquestionably a number of new problems would develop for solution by the company's engineers and the manufacturers' experts. In view of the great economies possible through its use it was decided upon, even in view of the pioneering necessary for its successful operation.

The distances between substations over 75 miles of line and the opening and closing of direct-current switches by this control system presented another problem, the solution of which was made possible by the use

One of the highway crossing signals used on the South Shore line. The base is made conspicuous by the alternate black and white lines in herringbone pattern

of a new system of automatic supervisory control, the carrier-current system.

This system, although untried, was adopted because of its economies. The first cost is less, due to the necessity of only a single line wire for its operation. Two dispatcher stations were provided, one for the power company's dispatcher for use in handling high-tension switching and the operation of conversion equipment and the other for the railroad's dispatcher in opening and closing the feeder equipment.

In the interest of further economy the railroad succeeded in negotiating a contract with the power company whereby it provided the conversion apparatus. Through the co-operation of engineers of the railroad and of the power company a system was worked out by which the best possible use was made of transmission line facilities which existed and brought together the best engineering ability of both companies in developing the new system.

Improvements Made in Permanent Way

Due to the fact that trains are operated over single track on the South Shore Line between Gary and South Bend, sidings are necessary at meeting points of trains. Formerly trains at these meeting points were run onto the siding and, after the train in the opposite direction had passed, backed out.

In the rehabilitation all sidings have been double-ended and equipped with high-speed turnout switches, enabling a train to operate onto the siding at high speed and, if the meeting train is waiting, to run through the siding without loss of time. The sidings were also lengthened to make possible their use by longer freight and passenger trains.

The siding at Wilson, Ind., one of the principal single-track meeting points, has been double-tracked for 2½ miles. This permits a flexibility of six minutes in the meeting time of trains. This track will be made a part of the double track of the railroad when this point is reached in that program.

Coincident with these changes, 30 single-track miles of 70-lb. rail was replaced with 100-lb. rail and nearly one-half of that mileage has been rock ballasted. More than 67,000 creosoted red oak ties have been used to replace old ties in the railroad.

Grading of the right-of-way, tending toward better drainage and safety, has been improved and more than 2,000 carloads of cinders used as ballast. New tie plates, angle bars and bonding have also been installed in the reconstruction of the track.

It was recognized that a number of years would elapse before all of the old 70-lb. rail could be replaced and, accordingly, new joints were put on this rail throughout the entire line. Tie plates used are double punched, making possible their use when the heavier rail is installed.

Twenty-five new railroad cross-overs have been built and entirely new layouts were installed at the Michigan City and South Bend yards of the railroad. In all track renewals the most modern type of special trackwork was installed. Manganese cross-overs and other hardened steel special work has been standard for replacements. The heavy rail and these high-class forms of special work tend toward greater ease in riding and in eventual economy, although the initial cost is somewhat greater.

New Type of Line Cars

One of the old-type motor passenger cars was rebuilt into a line car in the company's shops, having several unique features. A revolving platform, which can be swung under the wire on the adjacent track, tops the car. Its advantages are apparent. The platform is elevated from its position on the top of the cars by air hoists and the equipment has several major safety features.

As an operating economy and with a view toward eliminating as many work trains from the railroad as possible, a gasoline-driven highway motor truck was equipped with tools necessary for its use as a line car for making light repairs on the overhead system. It can also be used in case of an emergency power shutdown and has proved economical through the elimination of crews necessary to operate the line car.

New Telephone System Built

All dispatching on the line is done by telephone. In order to improve its communication service, an entirely new telephone system has been built by the railroad, under the supervision of its communication engineer. The latest type of telephone equipment was used in the system and latest practices of construction used. As an example, a radio loud speaker, with an amplifier, is installed in the dispatcher's office for receiving calls from trainmen, making unnecessary the usual earphone attachment.

In addition to the dispatching system private wires for the transaction of the company's business are in service

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connecting South Bend, Michigan City, Chicago and Gary. One of the interesting features of this new system is the arrangement made with the local telephone company for the connection of its lines and the railroad's private lines on the same switchboard. This makes possible the most economical use of both owned and leased wires.

A dispatching system for the motor coach line is included in this system. It is in use over a major portion of the coach line and is in the process of construction for the remainder of the system. Train and coach delays and other operating inefficiencies have been materially reduced by this new system of communication.

Improved Shop Practices

Electrically driven jacks for raising and lowering car bodies have replaced hand jacks in the South Shore Line shops, one of the more efficient methods adopted during the past year. The use of the new type jacks represents a saving of about 15 per cent in cost over the old method and provides increased energy for other duties on the part of the workers.

Reduction in maintenance costs was effected in the shops through the use of newly built electric ovens for the dipping and baking of armatures and fields of the motors used.

Shop tests have been made on the use of spray lacquer and the results have been so satisfactory that the twenty new passenger cars now under construction are to be finished in this recently developed product. Two of the passenger cars now in use have been refinished with lacquer.

Another practice which it is believed will lower the power costs to the railroad materially is soon to go into effect. Power-saving meters are being installed on all motor passenger cars and on locomotives and an organization is being perfected to carry on a systematic power-saving campaign.

Due to the many changes in operation with which the employees of the railroad had to become acquainted, it was deemed inadvisable to begin this power-saving campaign previous to the present time.

Signal System Rebuilt and Other Safety Measures Installed

When the South Shore Line came under the present management the signals in use were of the semaphore type. Due to the fact that they had not been given proper maintenance they had deteriorated to the point where signal failures were not uncommon. In order that the signals might be made to carry out their work of speeding up operation, at the same time providing maximum safety, a considerable amount of money was immediately spent on their rehabilitation, although it was apparent that a change in type would be made within a short time. The rebuilding program was carried out to a point where the confidence of the trainmen was restored and failures were reduced materially.

In order that maximum benefits could be realized from the signals it was decided to replace the semaphores with a color light signal. Due to the fact that the semaphores were placed close to the pole line for the overhead they were not easily distinguishable in many places. In carrying out the work of rebuilding all possible use was made of the materials used in the old signals. Additional facilities were provided for the reduction of maintenance and the increase of reliability, and other improvements made.

At several points on the line crossings with other railroads are interlocked. All of these interlocks have been completely rebuilt, providing a maximum of efficiency and safety.

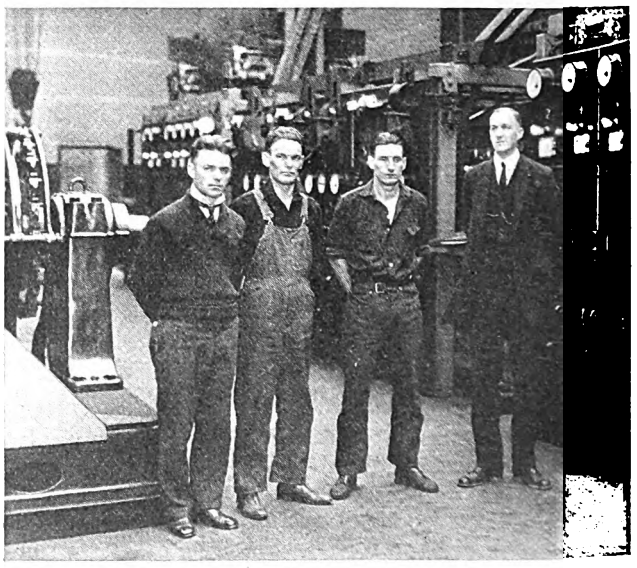
The company also established an extended safety campaign by posting safety messages in its trains, holding safety meetings among its employees, organizing first-aid teams, offering a medal (known as the Britton I. Budd medal) for the saving of human life, appointing a safety engineer and in many other ways. It has also started a "better business campaign" among the employees, has organized an A.E.R.A. company section and in many ways shown its interest in improving working conditions among the employees.

Financial Accomplishments

As already explained, at the time the present management assumed direction of the South Shore Line it was impossible to enlist outside capital as a means toward placing the railroad on a level necessary for efficient operation. In this emergency the Midland Utilities Company took over the task of financing the railroad. Had this not been done, it is probable that the operation of South Shore Line trains would have been discontinued within a few months. The railroad has also had the benefit of the expert engineering and purchasing facilities at the command of the Midland Utilities Company.

As an indication of the improved financial situation of the railroad, there were recently issued $2,310,000 equipment trust certificates, under the Philadelphia plan, maturing in from one to ten years, on a basis of 4½ per cent, 5 per cent and 5½ per cent.

Novel Features in Railway Substation



Asphalt mastic flooring makes this substation safe for attendants

TWO interesting construction features have been employed in the new downtown substation of the Market Street Railway, San Francisco, Cal. One is the main floor covering of asphalt mastic, a material with high insulation qualities. It is capable of withstanding a potential of 12,000 volts and makes the floor safe for substation employees. The other feature is a roof of glass, which makes the station more pleasant by permitting the sunlight to enter.

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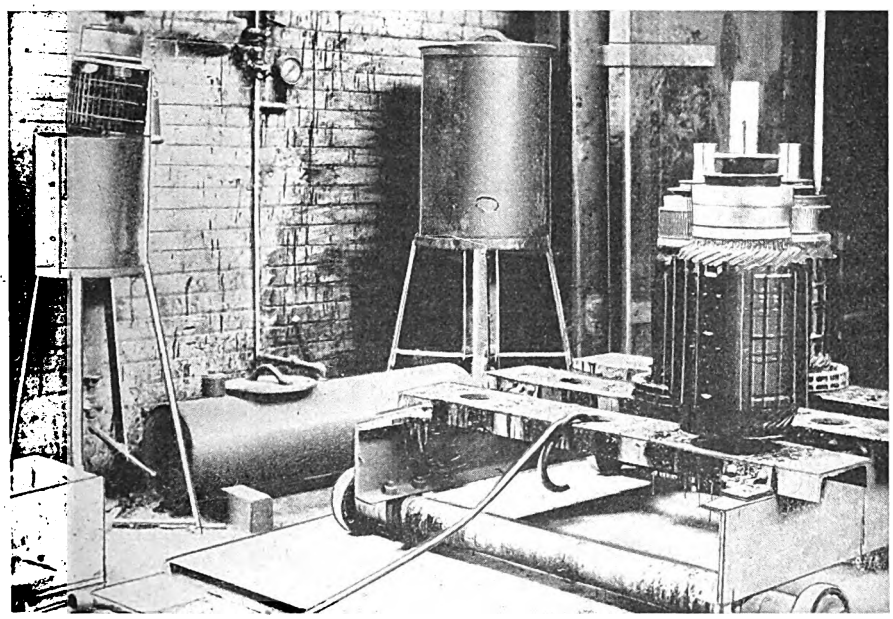
Maintenance Methods and Devices

Armature Varnish Stored in Closed Receptacle

VARNISH used in the dipping and baking process for armature treatment as employed in the shops of the Dallas Railway & Terminal Company, Dallas, Tex., is stored in an airtight drum when not in the dipping vats. The apparatus developed in these shops for doing this is operated by the shop air pressure of 90 lb. The dipping varnish is used in a 25-gal. horizontal tank at the floor level. Pipe connections are made between the ends of the tank and receptacles or vats of sufficient size to accommodate both compressor and motor armatures. The vats are set up on legs approximately 3 ft. in length. The air pressure is applied to the drum at the floor level, forcing the varnish into either one or both of the vats, depending upon which control valve is opened. The armature to be dipped is handled by overhead telfer and lowered into the dipping vat. The height of liquid on the armature is controlled by the air valve on the admission line. After the armature has been fully impregnated the air pressure on the drum is released and the varnish permitted to flow by gravity back into the drum. The connecting valve between the drum and the vat is closed and the varnish is thus inclosed in an airtight container. This method is said to reduce the amount of scum developed on the varnish and offers a positive means of controlling the extent of the dipping. In this process the company does not use collars to protect the lower end of the shaft; a piece of waste is used to wipe off the shaft while the armature is suspended above the dipping vat after being impregnated.



Equipment used in the shops of the Dallas Railway & Terminal Company for dipping and baking armatures

Two vats, mounted approximately 3 ft. above the floor, are supplied with dipping varnish from the horizontal tank at the floor level. Air pressure admitted to this horizontal tank forces the varnish into either or both of the dipping vats. The truck in the foreground has ball-bearing wheels and moves freely with its capacity of nine armatures. The baking oven is to the right of the large dipping vat.

In connection with the baking process, the company uses a ball-bearing truck made up of odds and ends from the shop. Old car axles are used and the frame is built of channel section. Holes bored in the web of the three-channel cross-members receive the shafts of the armatures to be baked. Large ball bearings of 6 in. outside diameter are used for wheels. The truck, when filled with nine armatures (its capacity) is easily wheeled in and out of the baking oven, which is adjacent to the dipping vats.

Reclaimed Bus Oil Used for Car Lubrication

By H. C. Pressler

Master Mechanic Eastern Texas Electric Company, Beaumont, Tex.

USE of reclaimed bus oil for lubrication of electric cars is the practice of the Eastern Texas Electric Company. After the oil has run its allotted time in the buses it is drained off and poured into a 50-gal. barrel. A piece of heavy felt is fitted over the top of the barrel so that the oil must strain through it. All carbon and foreign matter are thus removed and the oil comes out clear and with good body. With this oil used in journal bearings no trouble has been experienced. The wool waste does not get gummy and hard and pack away from the journal, but keeps loose and fluffy, which keeps it close on the bearing. The oil is used also on brakes.

Overcoming Short Circuits at Trolley Bases

By Otto Gottschalk

Engineer of Railway Equipment Havana Electric Railway, Havana, Cuba

GROUNDS between trolley bases and the steel roof supports on cars operated by the Havana Electric Railway caused considerable trouble. This was aggravated through the use of a metallic return which requires two trolley bases mounted close together on two trolley boards of equal width. Short circuits were caused by a current creepage over the surface of the boards and cleats of wood under the trolley boards. Dirt, rust and a salt deposit accumulated and the heavy rainstorms which take place in this climate during the summer months caused a film of water along the boards. The hot sun of Cuba also produced warping of the boards, so that they had a shallow dish shape and thus were ready receptacles for dirt and moisture.

Ordinary air drying insulating varnish was used to cover the wooden boards, but it was found that it would not adhere to them long enough to be effective and prevent the wood from becoming water soaked. This difficulty was overcome by painting the surfaces with baking varnish. This does not scale or crack and it does not

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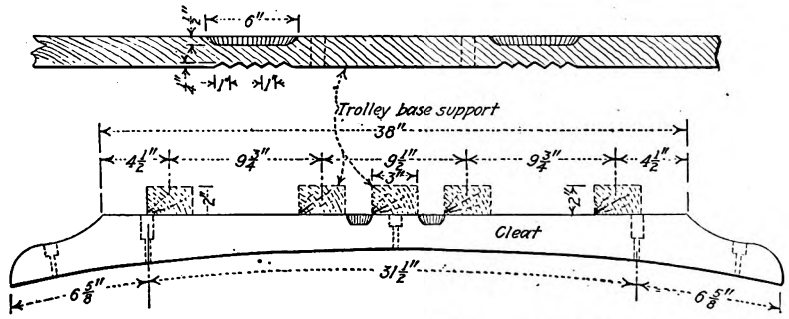


Trolley base support as used by the Havana Electric Railway

become hard and dried out by the hot sun. In addition a special construction is used to support and insulate the trolley bases, as shown in the accompanying illustration. The base supports are made of native hard wood and attached securely to cleats of the same material by using aluminum wood screws. These screws do not rust and they give greater strength than brass.

The cleats of the structure are attached to the steel roof supports by carriage bolts. The heads of these are countersunk into the cleats and the holes are then filled with baking varnish. The supports which hold the bases are cut on the upper side and in between the bases and the cleats so that an angular surface is formed similar to a house roof. This causes water to run off rapidly. On the under side of the supports and directly below the angular surface saw teeth are cut. These break up a continuous stream of water that may take place and cause short circuits. The cleats in close proximity to the bases are also angled to prevent current creepage. Another advantage from this construction is that the weight is reduced 40 per cent over the construction previously employed.

Brake Relining Machine Reduces Maintenance Cost

FORMERLY the El Paso Electric Company, El Paso, Tex., had bus brakes relined at a local brake service station. A mechanic from this garage had to remove the brake bands from the bus, make a trip to the office of the master mechanic for an order to have the work done, then take the bands to the brake service station. There he had either to wait for the work to be done or return later for the brake band. Meanwhile the bus was out of service. It sometimes happened that the brake service station could not do the work at once, and often a bus would be tied up for an entire day.

According to the company's brief for the 1927 Coffin Prize, this method proved so inefficient that a brake lining machine was installed in the company's own garage. The cost was only $102.83, but the expense of relining brakes on the nine buses for twelve months was cut from $349.62 to $228, or a saving of $121.62. In addition the necessity of holding buses out of service to reline brakes has been eliminated.

Eleven Suggestions for Better Commutation

By W. J. Walker

Railway Supply Department, General Electric Company

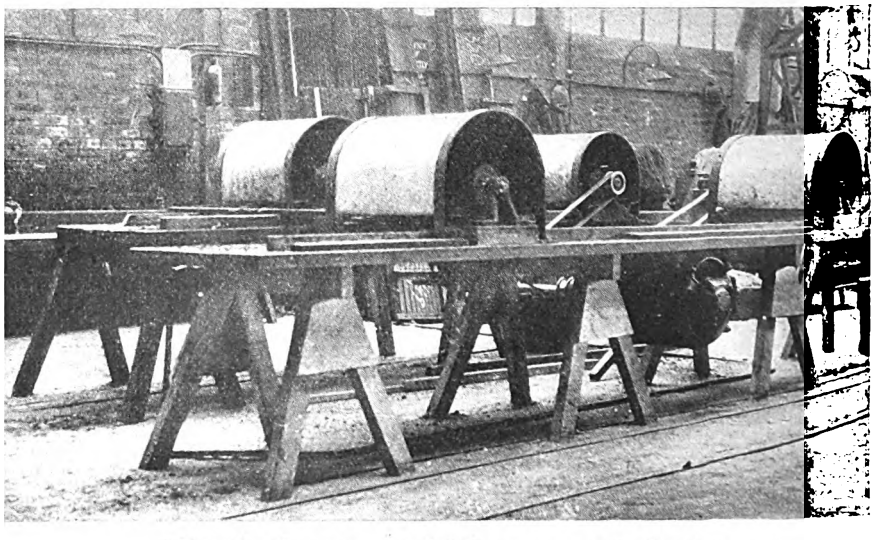
SATISFACTORY operation of railway motors depends largely on the care and attention given the commutators. One large railway motor manufacturer recommends that the following suggestions be carried out in order that successful commutation may be obtained:

1. Keep commutator mica segments undercut or grooved. The cutting depth should be about 3/64 in.
2. Keep the commutator surface smooth.
3. Use the best grade of brush, made of highest quality materials. The selection of the brush depends upon local conditions and the design of the motor.
4. Do not allow oil to come in contact with the commutator surface or the carbon brushes.
5. Adjust the bottom of the carbon box so that it will be between ⅛ in. and ¼ in. from the commutator surface.
6. See that the brush fits the carbon way without excessive clearance, but is free to move in response to the brush pressure arms. The maximum clearance between a new brush and new carbon way is 0.008 in. The clearance should not be allowed to exceed 1/32 in.
7. Replace worn carbon ways promptly. For older types of brush-holders, with the body and carbon way cast in one piece, consult the manufacturer for information regarding the substitution of modern units equipped with renewable carbon way boxes and steel clock-spring pressure arms. Improved types of brush-holders are available for a majority of the older railway motors, and their use means better commutation and more economical operation.
8. Clean the brush-holders and supports regularly. Moisture or dust on any part of the brush-holder or support may be the cause of electrical breakdowns.
9. Keep the bearing linings in good condition so that the armature air gap will be maintained uniformly. This will minimize the movement of the armature in going over rough track, which is frequently the cause of flashovers.
10. Maintain proper brush pressure and use the grade of brush recommended by the equipment manufacturer.
11. Keep track and roadbed in good condition. A rough track is the cause of many commutation troubles.

Machine for Removing Paint from Car Seats

PAINT on the slat seats of the cars of the London County Council, London, England, is removed prior to refinishing by means of a machine evolved for the purpose. Not all seats on its cars are of wood, some being upholstered, but there is a sufficient number of slat seats to warrant the construction of a machine of this kind.

The seats are first dipped in a tank containing a paint remover. They



These brushes remove paint from car seats in London

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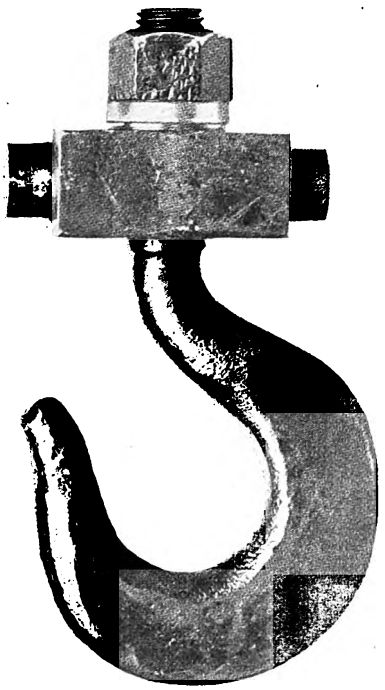
are then slid along a work table under two sets of revolving brushes, one of wire and the other of bristles, which thoroughly remove the paint. These brushes are shaped to fit the contour of the seats. The wire brushes remove the greater part of the paint. The remaining particles of paint are taken off by the bristle brushes. The brushes are covered with metal guards to prevent the particles of old paint flying about the room.

New Equipment Available

New Sizes Added to Line of Roller Bearing Crane Hooks

POPULARITY of crane hooks manufactured by the Rollway Bearing Company, Inc., New York, N. Y., has made it advisable to revise the list of sizes and add a number of new ones which will prove more convenient to customers than sizes previously listed, according to an announcement of that company. Crane hook bearings are now furnished in sizes to fit standard hooks with capacities from 5 to 100 tons. Larger sizes to fit the largest hook shank can also be furnished, but on these larger sizes the diameter of the shank and the permissible outside diameter of the bearing should be specified.



Rollway bearing as used on crane hook

The rollers and thrust plates in these bearings are made of high carbon alloy steel, heat treated. This insures uniform hardness throughout the piece and results in greater dependability than can be expected from a case-hardened piece. The large area of contact between rollers and plates prevents indentation sometimes found with ball bearings used on crane hooks and thereby insures free movement of the hook under heavy load.

A "dip and bake" every 500 days
Will keep down your car delays.

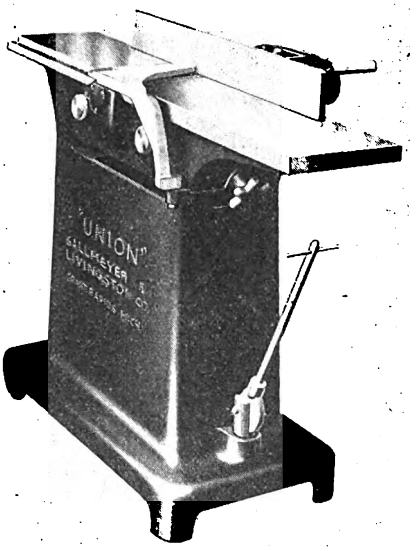
Twist Drill Grinding Attachment

GRINDING of twist drills accurately is possible by use of an attachment interchangeable with the standard tool grinding rest of Hisey grinders. The device has just been announced by the Hisey-Wolf Machine Company, Cincinnati, Ohio. This attachment not only will result in more accurate grinding of the drills but also will produce a saving in time over the old and obsolete free-hand method. It eliminates the use of gages, as a graduated micrometer screw adjustment insures identical lip lengths.

A 60-grit grinding wheel of medium grade is recommended for this work and should be dressed frequently so as to retain a straight face. The attachment will hold twist drills with either straight or taper shanks from $\frac{1}{4}$ in. to $1\frac{1}{4}$ in. diameter.

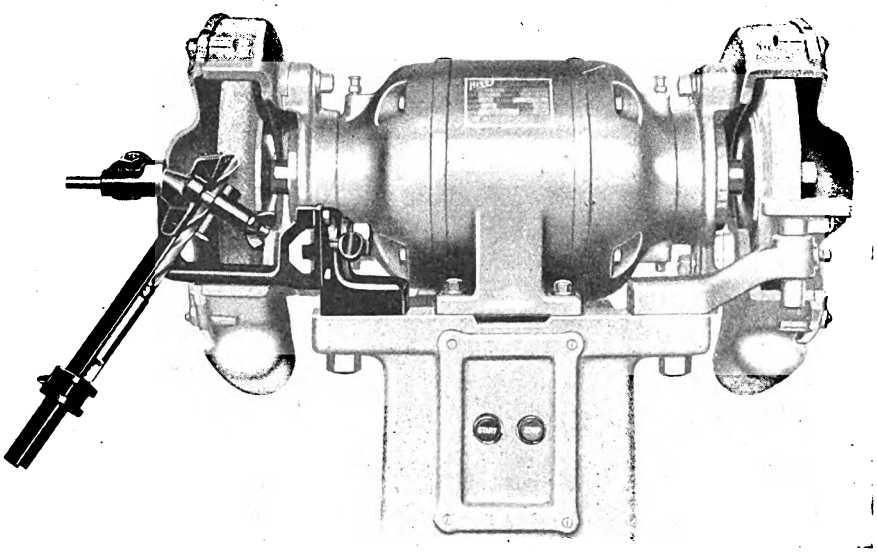
Small Portable Type Pedestal Mounted Jointer

AN 8-IN. jointer mounted on a portable truck type pedestal base is a new product of the Gallmeyer & Livingston Company, Grand Rapids, Mich. The machine is 44 in. over all, with 24-in. front table and 18-in. rear table. The rabbeting groove in the rear table and the vertical adjustment of the front table make it possible to rabbet up to $\frac{1}{2}$ in. on this machine. Both front and rear tables can be adjusted.



Motor-on-arbor 8-in. jointer mounted on truck base for portability

The machine is equipped with ball bearings and a motor mounted on the arbor. A three-knife safety cylinder carries three knives $8\frac{1}{4}$ in. long. The fence is adjustable and the knives are guarded carefully.



Twist drill grinding attachment fitted to 10-in. wheel grinder

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Association Activities

Iowa Operators Discuss Rail and Bus Service

WHEN buses are indicated by all the operating conditions, but their adoption involves the virtual scrapping of a heavy rail investment, which way is the operating company to turn? This problem, propounded in a paper given by D. D. Bentzinger, assistant to general manager Iowa Southern Utilities Company, brought out a discussion that was one of the high points in the annual convention of the Operators' Section, Iowa Electric Railway Association, held on Nov. 2 and 3 at Davenport, with nearly 150 members and guests in attendance.

The maintenance men had their innings also. Papers by Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad, on the elimination of equipment failures, and by W. L. Wilson, chief engineer maintenance of way Des Moines City Railway, on methods of track construction and maintenance followed on his city and interurban properties, excited keen interest in the form of a flood of experience details explained by C. M. Feist, master mechanic Sioux City Service Company; R. H. Findley, chief engineer Omaha & Council Bluffs Street Railway Company; W. G. Lamb, master mechanic Waterloo, Cedar Falls & Northern Railway; F. V. Skelley, superintendent of equipment Des Moines City Railway, and others.

Keeping the Lines Clear

In addition to Mr. Bentzinger's paper, bus operation was discussed by several speakers. A. P. Lewis, general superintendent Rockford & Interurban Railway and Rockford City Traction Company, told how snow storms have been made to pay profits, as well as to demonstrate the practical effect of co-ordination. Four Fordson tractors, purchased last November, were sent out ahead of the trolley sweepers, lowered materially the sweeper maintenance cost, and also enabled both cars and buses to operate on schedule for the first time, contributing materially, it was believed, to the passage of a favorable franchise shortly after the first storm of the winter.

Joint rail and bus service in Dubuque and East Dubuque was described by A. H. Smith, superintendent Dubuque Electric Company. In a city of walking distances, such as Dubuque, a special effort must be, and is, made to keep to schedules. The practice is followed of replacing defective cars or buses at points along the route. This avoids an open schedule caused by bringing units in for repairs. The system of bus maintenance and operation is patterned after that followed by the electric railway, according to Mr. Smith. Bus operators are also car operators, and repair men are shifted from one department to the other as the occasion may demand, hence the advantage of co-ordination. Seven buses are operated on two routes—one serving a residential area radiating fanwise from downtown Dubuque, and the other crossing the Mississippi River into East Dubuque. For these routes there are used, respectively, 25-passenger Macks and 16-passenger Dodge-Grahams. Losses with these buses are less than they would be if cars were operated, Mr. Smith asserted, and "we avoided building car line extensions long expected and requested numerous times."

A history of the gas-electric drive in bus service was presented by W. A. Clough, General Electric Company, Chicago. There are now in operation or on order 1,453 buses fitted with G.E. electric drive, of which one each is in India, England and Germany. An engine with modified torque characteristics was needed for the best results, he indicated. Electric braking had no place on a bus, was his personal opinion, although it might be improved by the use of a contactor and blowout instead of the present controller construction. He gave estimates of operating expense to show that under certain assumed conditions a group of ten buses with electric drive could run for 32.4 cents a mile, while the mechanical type would cost 34.6 cents a mile.

The circulating load method of handling passengers was advocated in a paper delivered by R. S. Frehse, sales engineer National Pneumatic Company, Chicago. Treadle interlocks had removed any possibility of the door being closed on a passenger, he said in answer to a question. Sixty operating companies are now using some 5,000 pneumatic door controls, on 3,000 trolleys and 216 buses.

Freight as a Source of Interurban Revenue

Freight as a means of building up interurban revenue was discussed in a paper by C. F. Dege, general superintendent Clinton, Davenport & Muscatine Railway. One-man operation, remodeling of cars, faster and more frequent schedules were adopted to stem the tide of decreasing passenger business, but had resulted to date only in retarding the rate of decrease of revenue, rather than in increasing that revenue. The only hope was in building up freight revenue, if the continuance of operation was to be warranted. Mr. Dege told of the changes required to do this: Freight-handling motors and locomotives had to be bought; sidings and stock yards provided; transfer connections with steam roads built; through rates and divisions established with connecting carriers. Above all, each member of the organization had to become a salesman, and the business, once secured, had to be handled so that it would be kept in the future. In ten years the gross tonnage of freight had been increased six times because of determined efforts. In 1916 the company handled 30,432 tons of less-than-carload and carload freight, while in 1926 the gross was 194,586 tons. This field had only been touched, Mr. Dege was convinced, and was destined to become the major part of the operation.

Mr. Bentzinger went even further

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 16-17*—Central Electric Traffic Association, Keenan Hotel, Fort Wayne, Ind.**

***Nov. 17*—Central Electric Railway Accountants' Association, Keenan Hotel, Fort Wayne, Ind.**

***Nov. 17-18*—American Society Mechanical Engineers, annual meeting, Engineering Societies Building, 29 West 39th Street, New York, N. Y.**

***Nov. 17-18*—Personnel Research Federation, Accident Reduction section, 40 West 40th Street, New York, N. Y.**

***Nov. 28-30*—American Institute of Electrical Engineers, regional convention, Drake Hotel, Chicago, Ill.**

***Dec. 1, 2*—Pennsylvania Street Railway Association, annual meeting, Scranton, Pa.**

***Dec. 2*—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York, N. Y.**

***Dec. 2*—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.**

***Jan. 16-17*—Midwest Electric Railway Association, Hot Springs, Ark.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.**

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than indicated in the opening paragraph of this report. It was his opinion, received without comment, that further development of transportation systems in communities such as Burlington and Ottumwa (both of about 30,000 population) could not be justified. His own company felt a moral obligation to render the service, or would willingly abandon it at any time. Operating figures indicated, he said, that if relieved of the cost of furnishing and maintaining paving over the car routes, the company could operate street cars cheaper than it could buses. In Burlington, over a two-year period, and a total of 700,000 miles, nine 25-passenger buses had averaged 15.25 cents a mile. This figure included depreciation on a 250,000-mile basis, but did not cover garage rental. Mechanically, the modern bus is entirely satisfactory, his experience being that the statements of the manufacturers regarding operation are justified.

Using Burlington as an example, Mr. Bentzinger asked for discussion as to what the transportation company should do when a five-year paving program, to cost $250,000, was staring it in the face. Should the company continue to pour money into a well that apparently had no bottom? Or should it charge off the million-dollar investment in a trolley system, and go over to all-bus operation? A bitter pill, but the sooner swallowed, the better, was the verdict of B. W. Arnold, assistant to the general manager Chicago, North Shore & Milwaukee Railroad. The layout of the city, as well as its population, must be considered, suggested R. J. Smith, vice-president Tri-City Railway of Iowa. It might be worth while in Burlington to continue a trunk trolley line and abandon the others. The experience of the Iowa Railway & Light Company was outlined by E. F. Winslow, superintendent of transportation. Two years ago interurban headway between Cedar Rapids and Mount Vernon had been lengthened from one hour to two hours, with buses filling in the alternate hour. This had not increased the riding, so now the rails were being torn up.

John Sutherland Retires

At the banquet, which was one of the entertainment features, the delegates were welcomed by R. B. MacDonald, president of the Tri-City Railway of Iowa, who expressed the hope that the convention would give them renewed zeal so they could go home and solve the many problems of the industry. John Sutherland, retiring after ten years as chairman of convention, was presented with a Masonic diamond ring, from the members of the Operators' Section, the ceremony being performed by Maurice Welsh, chairman of the executive committee. Another feature was a trip of inspection through the Tri-City shops in Davenport and Rock Island, carried out with the help of the outdoor bus exhibit, which included demonstration vehicles shown by Bender, Murray, both on White chassis, Yellow, Twin Coach, Mack and Studebaker. During the closing business session, after the matter had been explained by B. W. Arnold, the section voted to support, individually and as a body, the legislation regulating interstate motor carriers of passengers, to be submitted at the next session of Congress. E. J. Anderson, general superintendent Tri-City Railway, was elected chairman of convention for the next year, it was announced. Maurice Welsh of Waterloo was re-elected chairman of the executive committee, as were the following members: R. W. Herrick, Sioux City; F. S. Welty, Omaha; E. W. Miller, Des Moines; A. H. Smith, Dubuque; Charles F. Weil, Chicago; Robert Sampson, Mansfield, Ohio; K. A. Hills, Davenport, and G. J. Hart, Pittsburgh.

Freight Is Becoming a Major Source of Revenue*

By C. F. Dege

General Superintendent Clinton, Davenport & Muscatine Railway, Davenport, Iowa

FOR some time it has been apparent that the only hope of this company to secure enough revenue to warrant its continued operation was through an increase in freight business, and for this reason the company has been making a vigorous effort to secure such business. This has required a great change in our methods of operation, because, like many other interurbans, we had been depending almost entirely on passenger business and had handled very little freight.

Freight locomotives were purchased, sidings were provided, transfer connections with the steam roads built and through rates and divisions established with connecting carriers. Stock yards were built and service started to put the interurban in a position to solicit the business.

We had to change the attitude of every man on our property so that people in our territory would like to do business with us. From the general manager down through the ranks, we all have tried to make salesmen of ourselves and to establish good public relations. Nothing can take the place of personal contact to promote good public relations. We drop in to see our patrons and meet the public officers of the various communities in our territory in a casual way and talk over matters of mutual interest.

We have had some success in having our employees solicit freight and passenger business. Our failure to give good service is often detected by these employees and action is then taken to eliminate further cause for complaint. We have a regular freight solicitor who covers each community in our territory about once each month. In addition our several department heads devote part of their time to soliciting freight.

Our freight service consists of two freight trains daily except Sunday in each direction over each division. For rush shipments we give passenger car package service every hour and a half at a rate a little higher than the regular freight rate. This service has proved very popular and has given us a substantial increase in revenue.

Claims for lost or damaged freight are highly undesirable and we have done much in the last few years to reduce the amount of money lost in that way. Our men are taught how to stow freight in the cars and how to handle it to avoid damage. They are required to make reports to show cause when freight is damaged, and to avoid making the reports they handle the freight more carefully. Careful inspection of all goods must be made by the receiving and delivery clerks and notations made on the bills of lading or delivery receipts when loss or damage is noticed. Fair claims must be paid quickly and unfair claims declined just as quickly.

Time seems to be the most important element today in handling freight. Business houses carry smaller stocks today and depend on fast freight service. Delays at transfer points are being cut to a minimum, freight being available for delivery immediately on arrival. The consignee is notified of the arrival of his goods at once, because if that notification is delayed all efforts to hasten the shipment over the line are wasted.

Any change in our freight schedules is made known to our patrons through bulletins to their traffic managers and shipping clerks. We keep the shipping association and traffic clubs advised of our activities and invite people to call our agents and tariff clerks for rates and routing information.

The freight business is destined to become our major operation. As an example of what can be done in building up freight business, I will give you a few figures to show the result of our efforts along that line. In 1916 we handled a gross freight tonnage of 30,432, including both less-than-carload and carload. In 1926 our gross tonnage increased to 194,586, more than six times as much freight as in 1916. In September this year we handled 27,812 tons on the Clinton Division alone, almost as much as we handled on both divisions in 1916.

In a word, we were driven to look to a new source for our major revenue, and feel real encouragement from our comparatively recent efforts to develop that source. Many complications are brought into management and operation by the intensive development of this freight business, but they seem well worth while in view of the possible revenue to be derived.

* *Abstract of a paper presented at the annual convention of the Operators' Section, Iowa Electric Railway Association, Davenport, Iowa, Nov. 2 and 3, 1927.*

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Rail Executives Meet at Purdue on Nov. 11

BETWEEN 200 and 250 railway executives from throughout the United States and Canada are expected at Purdue University on Nov. 11 to inspect the research work being conducted by the university's engineering experiment station for the American Railway Association on the testing of air-brake equipment and draft gears. The air-brake tests have been under way nearly two years, under the direction of Harley A. Johnson, director of research for the Railway Association, and also general manager of the Chicago Elevated Railroads. The draft gear tests were started last spring at the Purdue Engineering Experiment Station.

American Association News

More Engineering Committees Announced

FURTHER appointments of committees of the Engineering Association have been announced at association headquarters. These include both standing committees and special committees of the various divisions that have been set up to cover the technical work of the association. The four technical standing committees in charge of these divisions were announced in this paper for Oct. 29, page 833. The additional appointments follow:

EDITING OF PROCEEDINGS AND REPORTS

F. H. MILLER, vice-president and general manager Louisville Railway, Louisville, Ky., chairman.
E. M. T. RYDER, New York, N. Y.

ENGINEERING MANUAL

F. H. MILLER, vice-president and general manager Louisville Railway, Louisville, Ky., chairman.
L. D. BALE, Cleveland, Ohio.
E. M. T. RYDER, New York, N. Y.

REVISION OF CONSTITUTION AND BY-LAWS

W. W. WYSOR, chief engineer United Railways & Electric Company, Baltimore, Md., chairman.
F. McVITTIE, Rochester, N. Y.
F. H. MILLER, Louisville, Ky.

SUBJECTS

P. V. C. SEE, superintendent car equipment Northern Ohio Power & Light Company, Akron, Ohio, chairman.
L. D. BALE, Cleveland, Ohio.
C. H. JONES, Michigan City, Ind.
W. W. WYSOR, Baltimore, Md.

HEAVY ELECTRIC TRACTION

H. F. BROWN, assistant electrical engineer New York, New Haven & Hartford Railroad, New Haven, Conn., chairman.
A. H. ARMSTRONG, Schenectady, N. Y.
J. M. BOSENBURY, Springfield, Ill.
MORRIS BUCK, New York, N. Y.
S. B. COOPER, East Pittsburgh, Pa.
A. H. DAUS, Chicago, Ill.
J. C. DAVIDSON, Schenectady, N. Y.
J. H. DAVIS, Baltimore, Md.
J. V. B. DUER, Altoona, Pa.
J. T. HAMILTON, New York, N. Y.
J. W. HULME, New York, N. Y.
E. C. JOHNSON, Los Angeles, Cal.
M. W. MANZ, Mansfield, Ohio.
L. S. WELLS, New York, N. Y.
L. C. WINSHIP, North Adams, Mass.

Power Division

SPECIAL COMMITTEE NO. 2—POWER RECTIFIERS

H. W. CODDING, assistant engineer Public Service Production Company, Newark, N. J., chairman.
C. A. BUTCHER, East Pittsburgh, Pa.
C. L. DOUB, Philadelphia, Pa.
F. W. PETERS, Schenectady, N. Y.
W. S. RICHHART, Fort Wayne, Ind.
G. I. WRIGHT, Philadelphia, Pa.

SPECIAL COMMITTEE NO. 4—SWITCHBOARDS

C. E. BENNETT, general engineer Georgia Power Company, Atlanta, Ga., chairman.
C. A. BUTCHER, East Pittsburgh, Pa.
H. J. CASEY, Baltimore, Md.
F. W. PETERS, Schenectady, N. Y.

SPECIAL COMMITTEE NO. 5—CATENARY SPECIFICATIONS

DWIGHT L. SMITH, electrical engineer Chicago Rapid Transit Company, Chicago, Ill., chairman.
S. H. ANDERSON, Los Angeles, Cal.
W. H. BASSETT, Waterbury, Conn.
L. W. BIRCH, Mansfield, Ohio.
W. F. HEALY, Cleveland, Ohio.
S. S. HERTZ, New York, N. Y.
JOHN LEISENRING, Springfield, Ill.
W. SCHAAKE, East Pittsburgh, Pa.
A. SCHLESINGER, Indianapolis, Ind.
R. E. WADE, Schenectady, N. Y.

SPECIAL COMMITTEE NO. 6—TROLLEY WIRE WEAR

H. S. Murphy, staff engineer Philadelphia Rapid Transit Company, Philadelphia, Pa., chairman.
J. WALTER ALLEN, Boston, Mass.
S. H. ANDERSON, Los Angeles, Cal.
W. H. BASSETT, Waterbury, Conn.
L. W. BIRCH, Mansfield, Ohio.
M. W. COOKE, Pittsburgh, Pa.
C. L. HANCOCK, New York, N. Y.
A. J. KLATTE, Chicago, Ill.
J. F. NEILD, Toronto, Ont., Canada.
ANGUS SCOTT, Cleveland, Ohio.
G. F. WENNAGEL, Baltimore, Md.

SPECIAL COMMITTEE NO. 7—INDUCTIVE CO-ORDINATION AND RADIO INTERFERENCE

W. J. QUINN, electrical engineer Third Avenue Railway System, New York, N. Y., chairman.
S. H. ANDERSON, Los Angeles, Cal.
D. D. EWING, Lafayette, Ind.
J. F. NEILD, Toronto, Ont., Canada.
A. SCHLESINGER, Indianapolis, Ind.

SPECIAL COMMITTEE NO. 8—TROLLEY WIRE REELS

J. F. NEILD, electrical engineer Toronto Transportation Commission, Toronto, Ont., Canada, chairman.
W. H. BASSETT, Waterbury, Conn.
C. L. HANCOCK, New York, N. Y.
K. J. KEITH, Des Moines, Iowa.
A. J. KLATTE, Chicago, Ill.
D. L. SMITH, Chicago, Ill.

SPECIAL COMMITTEE NO. 10—LIGHTNING PROTECTION

C. E. BENNETT, general engineer Georgia Power Company, Atlanta, Ga., chairman.
A. L. ATHERTON, East Pittsburgh, Pa.
R. E. BEERS, Schenectady, N. Y.
H. W. DAVIS, Utica, N. Y.
S. S. HERTZ, New York, N. Y.
A. D. McWHORTER, Memphis, Tenn.
A. TAURMAN, Birmingham, Ala.

SPECIAL COMMITTEE NO. 11—DISTRIBUTION SYSTEMS

JOHN LEISENRING, electrical superintendent Illinois Traction System, Springfield, Ill., chairman.
A. J. KLATTE, Chicago, Ill.
H. S. MURPHY, Philadelphia, Pa.
J. F. NEILD, Toronto, Ont., Canada.
A. SCHLESINGER, Indianapolis, Ind.
ANGUS SCOTT, Cleveland, Ohio.

SPECIAL COMMITTEE NO. 12—FERROUS AND NON-FERROUS MATERIALS

H. S. MURPHY, staff engineer Philadelphia Rapid Transit Company, Philadelphia, Pa., chairman.
MERLE ALDRICH, Michigan City, Ind.
L. W. BIRCH, Mansfield, Ohio.
H. F. BROWN, New Haven, Conn.
C. L. HANCOCK, New York, N. Y.
S. S. HERTZ, New York, N. Y.

Purchases and Stores Division

SPECIAL COMMITTEE NO. 1—REVIEW OF MANUAL

J. FLEMING, assistant secretary and purchasing agent Capital Traction Company, Washington, D. C., chairman.
C. A. HARRIS, Pittsburgh, Pa.
A. E. HATTON, Pittsburgh, Pa.

SPECIAL COMMITTEE NO. 2—STUDY OF ADVANTAGES OF UNIT PILING

W. E. SCOTT, superintendent of supplies Philadelphia Rapid Transit Company, Philadelphia, Pa., chairman.
B. W. FORKNER, Mansfield, Ohio.
F. A. JORDAN, Atlanta, Ga.

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T. H. McGarry, Boston, Mass.
W. J. Walker, Schenectady, N. Y.
A. E. Hatton, Pittsburgh, Pa.

Special Committee No. 3—Investment Material and Supplies

C. A. Harris, chief of stores Philadelphia Company and allied corporations, Pittsburgh, Pa., chairman.
A. S. Duncan, East Pittsburgh, Pa.
A. L. Fischer, Cincinnati, Ohio.
W. P. McArdle, New York, N. Y.

Rolling Stock Division

Special Committee No. 1—Manual Review

W. C. Bolt, superintendent rolling stock and shops Eastern Massachusetts Street Railway, Chelsea, Mass., chairman.
W. S. Adams, Philadelphia, Pa.
T. H. Nicholl, Anderson, Ind.

Special Committee No. 3—Car Design

H. H. Adams, superintendent shops and equipment Chicago Surface Lines, Chicago, Ill., chairman.
H. S. Williams, Detroit, Mich., vice-chairman.
O. W. Basquin, Chicago, Ill.
J. A. Brooks, Philadelphia, Pa.
C. A. Burleson, Schenectady, N. Y.
W. J. Clardy, East Pittsburgh, Pa.
L. J. Davis, Brooklyn, N. Y.
Charles Gordon, New York, N. Y.
W. L. Harwood, Springfield, Mass.
A. P. Jenks, Chicago, Ill.
A. L. Kasemeier, Winton Place, Ohio.
G. L. Kippenberger, St. Louis, Mo.
John Lindall, Boston, Mass.
C. R. McMahon, Oakland, Cal.
W. R. McRae, Toronto, Ont., Canada.

Special Committee No. 4—Lighting

R. W. Cost, commercial engineering department, Westinghouse Lamp Company, Bloomfield, N. J., chairman.
A. L. Broe, Harrison, N. J.
W. W. Brown, Brooklyn, N. Y.
H. F. Deininger, Philadelphia, Pa.
E. E. Dorting, New York, N. Y.
H. A. Otis, Chicago, Ill.
J. P. Staples, Charleroi, Pa.

Special Committee No. 6—Lubrication

J. H. Lucas, superintendent of rolling stock Milwaukee Electric Railway & Light Company, Milwaukee, Wis., chairman.
A. A. Green, New York, N. Y.
C. Bethel, East Pittsburgh, Pa.
C. A. Burleson, Schenectady, N. Y.
L. W. Jacques, East St. Louis, Ill.
J. F. Lamb, New York, N. Y.
W. H. McCarty, Washington, D. C.

Special Committee No. 8—Motor Brushes

R. A. Hutchins, motor division, railway equipment engineering department, General Electric Company, Erie, Pa., chairman.
Harry Childs, Clifton, Staten Island, N. Y.
F. W. McCloskey, E. Pittsburgh, Pa.
R. D. Voshall, Washington, D. C.

Special Committee No. 9—Noise Reduction

H. S. Williams, assistant superintendent of equipment Department of Street Railways, Detroit, chairman.
C. Bethel, East Pittsburgh, Pa.
N. R. Brownyer, Detroit, Mich.
R. S. Beers, Schenectady, N. Y.
C. J. Ellis, Winton Place, Ohio.
T. H. Minary, Louisville, Ky.
R. M. O'Brien, New Orleans, La.
H. L. Rogers, Cincinnati, Ohio.
R. D. Voshall, Washington, D. C.

Special Committee No. 11—Current Collecting Devices

Hugh Savage, superintendent of equipment Brooklyn City Railroad, Brooklyn, N. Y., chairman.
W. C. Klein, Allentown, Pa.
H. S. Murphy, Philadelphia, Pa.
D. L. Smith, Chicago, Ill.
W. Schaake, East Pittsburgh, Pa.
R. E. Wade, Schenectady, N. Y.

Special Committee No. 13—Limits of Wear

D. F. Smith, railway engineering department, General Electric Company, Erie, Pa., chairman.
J. M. Bosenbury, Springfield, Ill.
C. Bethel, East Pittsburgh, Pa.
J. H. Lucas, Milwaukee, Wis.
W. R. McRae, Toronto, Ont., Canada.

Way and Structures Division

Special Committee No. 1—Manual Review

W. R. Dunham, Jr., executive engineer Department of Street Railways, Detroit, Mich., chairman.
T. H. David, Indianapolis, Ind.
J. S. Mahan, Chicago, Ill.
D. H. Walker, Indianapolis, Ind.
D. J. Graham, Youngstown, Ohio.

Special Committee No. 2—Special Trackwork

E. M. T. Ryder, way engineer Third Avenue Railway System, New York, N. Y., chairman.
E. P. Roundey, Utica, N. Y., vice-chairman.
C. A. Alden, Steelton, Pa.
J. U. Bragg, Baltimore, Md.
E. B. Entwisle, Johnstown, Pa.
R. B. Fisher, Harvey, Ill.
H. F. Heyl, Easton, Pa.
W. G. Hulbert, New York, N. Y.
M. M. Johnson, New Haven, Conn.
D. H. Payne, Hoboken, N. J.
G. A. Peabody, Cleveland, Ohio.
W. W. Wysor, Baltimore, Md.

Special Committee No. 4—Track Ballast and Drainage

S. Clay Baker, engineer maintenance of way East St. Louis & Suburban Railway, East St. Louis, Ill., chairman.
E. J. Archambault, Milwaukee, Wis.
L. T. Botto, San Antonio, Texas.
A. C. Eddy, Vancouver, B. C., Canada.
C. L. Hawkins, St. Louis, Mo.
J. H. Haylow, Memphis, Tenn.
A. F. Smith, Allentown, Pa.

Special Committee No. 6—Arc Welding

C. F. Gailor, consulting engineer, New York, N. Y., chairman.
E. E. Barnard, Lynchburg, Va.
H. E. Bean, Syracuse, N. Y.
C. A. Burleson, Schenectady, N. Y.
A. M. Candy, East Pittsburgh, Pa.
H. H. Dartt, Scranton, Pa.
A. L. Donnelly, New Haven, Conn.
R. B. Fehr, Detroit, Mich.
E. P. Goucher, Washington, D. C.
E. L. Lockman, Boston, Mass.
W. M. Raiguel, Philadelphia, Pa.
Jonathan Wolfe, Chicago, Ill.

Special Committee No. 7—Alloy Steels Other Than Manganese for Special Trackwork

A. T. Spencer, general superintendent of construction and maintenance Montreal Tramways, Montreal, Que., Canada, chairman.
R. B. Fehr, Detroit, Mich.
F. G. Hibbard, Milwaukee, Wis.
P. A. Kerwin, Detroit, Mich.
B. P. Legare, San Francisco, Cal.
R. H. Noderer, Johnstown, Pa.
O. C. Rehfuss, Montreal, Que., Canada.
N. E. Salsich, Bethlehem, Pa.

Special Committee No. 8—Pavement

A. E. Harvey, superintendent of construction Kansas City Public Service Company, Kansas City, Mo., chairman.
N. R. Alexander, Chicago, Ill.
C. W. Burke, Brooklyn, N. Y.
W. G. Matthews, Denver, Col.
J. H. Sundmaker, Cincinnati, Ohio.
W. L. Wilson, Des Moines, Iowa.

Special Committee No. 11—Track Construction

C. L. Hawkins, engineer of way and structures United Railways of St. Louis, St. Louis, Mo., chairman.
W. R. Dunham, Jr., Detroit, Mich.
H. H. George, Newark, N. J.
E. P. Goucher, Washington, D. C.
E. M. T. Ryder, New York, N. Y.

Special Committee No. 12—Rail Corrugation

W. W. Wysor, chief engineer United Railways & Electric Company, Baltimore, Md., chairman.
C. H. Clark, Cleveland, Ohio.
E. B. Entwisle, Johnstown, Pa.
D. D. Ewing, Lafayette, Ind.
R. B. Fehr, Detroit, Mich.
H. Fort Flowers, Findlay, Ohio.
C. R. Kinnear, Toronto, Ont., Canada.
T. J. Lavan, Cleveland, Ohio.
E. L. Lockman, Boston, Mass.
A. M. Nardini, Philadelphia, Pa.
J. Ormondroyd, E. Pittsburgh, Pa.
H. J. Tippett, New Haven, Conn.
C. L. Van Auken, Chicago, Ill.
H. S. Williams, Detroit, Mich.

Special Committee No. 15—Track Gage

C. H. Clark, engineer maintenance of way Cleveland Railway, Cleveland, Ohio, chairman.
R. S. Bull, Pittsburgh, Pa.
E. P. Roundey, Utica, N. Y.

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News of the Industry

Discussion Resumed in Chicago

Disagreement over term franchises holds up the consideration of final traction bill. Attention received by subway matters

THAT subway construction cannot be started in Chicago until the pending traction enabling legislation has been passed was the opinion of several members of the City Council subcommittee which recently resumed consideration of the five new measures designed to solve the local railway problem. Discussion on this point arose when the Aldermen decided to hold a final review of the subway bill which they had approved several weeks ago.

Alderman Joseph B. McDonough, chairman of the City Council committee on local transportation, contended that until the entire set of bills is passed it will be impossible to proceed with the plan of Michael J. Faherty, head of the board of local improvements, to build subways by special assessment. The city must contract for the use of the tubes before they are built, and this will not be done until the whole transit problem is settled, he added.

In this connection, and upon the recommendation of Alderman J. B. Bowler, the sub-committee instructed Assistant Corporation Counsel James W. Breen to draft a bill to transfer the power to build subways by special assessment from the board of local improvements to the City Council. If the board of local improvements submitted a subway plan under the present law, Mr. Bowler declared, the City Council could only accept or reject it, but could not amend it. This, he said, gives the board the sole power to decide where the tubes shall be located and all the specifications of their construction.

The original subway bill approved by the sub-committee provided that the Council can construct the tubes by means of a special assessment and can also decide whether the relocation of public utility pipes and conduits is to be made a part of the subway costs to be paid for by the city or by the public utility affected, or the cost shall be divided among the various interested parties.

A Chicago municipal subway commission, headed by Mr. Faherty, has been in Europe for the past month studying the subway systems of London and the principal continental cities.

Consideration of the fifth and last bill on the traction legislation program, namely, that limiting the length of term franchises, was delayed until Nov. 5 because of the difficulty of the members of the sub-committee to decide whether the measure should provide for an alternative franchise of a limited number of years or leave with the Council the decision as to how many years such a term franchise should run.

In the corresponding bill introduced by the railways in the Legislature last spring a 40-year limit was provided for term franchises. The Aldermen have tentatively struck out that limit, making it possible to have term franchises for 50, 75, 100 or any other number of years. Some Aldermen have pointed out that this would give the City Council power to grant a franchise that might run 100 years without revocation.

Proponents of the no-limit plan replied that bankers will not finance a short-term franchise, and that if the city has the right to issue a 50 or 60-year grant its leverage would be greater on the local companies which want a terminable permit.

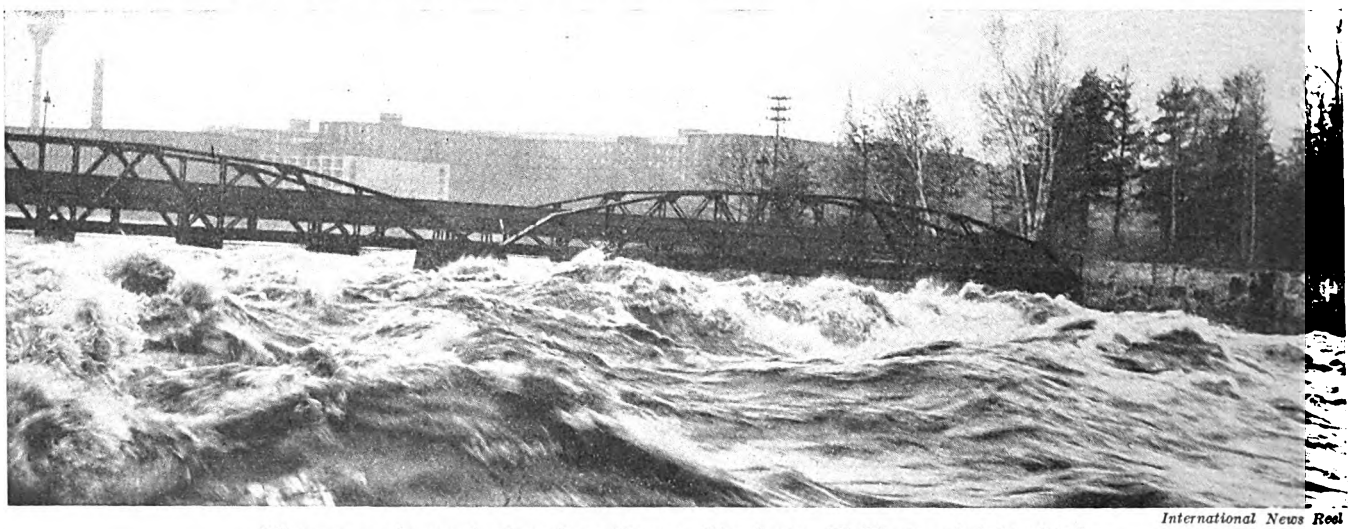
Flood Strikes New England Utilities

Power systems in Vermont and New Hampshire hard hit, but recovering rapidly. Major Massachusetts and Connecticut plants escape lightly. Little electric railway damage

WITH the force of a tropical cloudburst, a rainstorm and flood of unprecedented intensity swept through north-central New England on Thursday, Nov. 3, causing a loss of about 150 lives and destroying many millions of dollars' worth of property. Public utility plants in Vermont were overwhelmed, those in northern New Hampshire were also hard hit, and the systems operating in the Connecticut Valley went through a deluge which strained their equipment and personnel close to the limit. No lives are known to be lost among men and women in any branch of the electrical industry.

Despite the damage sustained by the power utilities and the service interruptions, which reached a climax in the Green Mountain region, every dam of major importance held, no plants of primary consequence were irreparably injured, transmission lines of trunk type stood firm, and fine records of service in restoration under the handicap of broken communication by rail, highway and wire were achieved.

Water in the Housatonic River reached a crest Friday. No stations on the Housatonic shut down, and there was very little curtailment of capacity. The crest of the flood passed Spring-



International News Reel

Water poured over the Amoskeag Dam at Manchester, N. H., to a height of 9 ft.

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Approach to the power plant of the railway at Hartford was by rowboat

field, Mass., at 5 p.m. Sunday and Hartford Monday at 2 a.m. At Hartford approximately 200,000 sec.-ft. was recorded. All transmission lines were held in service. The Connecticut River at the South Meadow station, Hartford, rose to within 3 ft. of the power-plant openings. At Middletown, Conn., service was cut off for about 24 hours owing to the flooding of substations.

In Connecticut the electric railways suffered from flood conditions along the Connecticut, Mad and Naugatuck Rivers. Considerable damage was done to the roadway and equipment, but the loss of revenue due to suspension of service was an even more severe blow.

At Hartford the Connecticut River rose to unprecedented heights and flooded many streets in the lower part of town. On Nov. 6 water stood 7½ ft. deep in the street outside the power house of the Connecticut Company. It came up nearly to the bottom of the windows and a shut down was feared. Fortunately this did not occur and the station has remained constantly in service. Some injury was sustained by the equipment, however. Just what this will amount to cannot yet be determined, but it is feared that it may be severe. Divers are at present examining the condenser intake and outlet to find the extent of the damage done.

Between Nov. 4 and 9 service was suspended for varying periods on car lines operating in the waterfront district and on several suburban lines. A large part of the town of East Hartford was submerged and electric railway tracks were under water in a number of places. Wherever possible buses were operated over routes on high ground to give partial service to districts ordinarily served by the suspended railway lines.

At Middletown, below Hartford on the Connecticut River, similar trouble was experienced from high water. Car lines running to points outside the town were forced to suspend service, but the local lines were not greatly affected. Serious trouble was experienced at Winsted, on the Mad River, and at Torrington, on the Naugatuck. Waterbury and Derby, also on the Naugatuck, were less seriously affected. At New London, on the Thames, no trouble occurred.

With about 4 ft. of water in the streets of Winsted and a couple of feet in the streets of Torrington, all car service in that district was suspended for several days. At Waterbury the water covered the floor of the Connecticut Company's paint and overhead shops to a depth of 6 in. The boiler room was flooded and the entire plant was without heat. Electric motors in the boiler house and the electric hoisting apparatus in the pits of the overhaul shop were removed in time to prevent damage. Car service in the city of Waterbury, which is considerably above the river, was not interrupted, but the line from New Haven to Waterbury via Derby was discontinued for a time because of high water at Naugatuck. One of the local lines in Derby was also forced to suspend operations.

Service on all Lines Normal

According to R. J. Bennett, assistant general manager of the Connecticut Company, service on all lines has now been restored to normal. Comparatively little damage has been done to the physical property of this company except at the Hartford power station referred to previously. This was largely because of the width of the Connecticut River at its lower end, which prevented the strong and destructive current experienced in its upper stretches. Some damage was done to motors and armatures, but this was not greater than would occur during an ordinary heavy rain, as no attempt was made to operate the cars over submerged track. Bridges were found to be sound by the engineers.

Electric railways in western Massachusetts suffered heavy losses from washouts, submerged tracks, detours and forced suspension of service in some cases. Service between Springfield and Holyoke was interrupted owing to flooded tracks in the Riverdale and Springdale sections and traffic between the two cities was routed by way of Chicopee Falls. On the route from Springfield to Westfield buses replaced cars for a time on Nov. 5 between Tatham and Westfield. Later in the day the tracks were cleared of water, repairs made and regular traffic resumed.

Memorial Bridge at Springfield was closed to traffic Saturday night, Nov. 5, and traffic routed over the North End bridge. The Agawam bridge, over which cars of the Springfield Street Railway are run through Agawam, was closed Friday morning, owing to concern as to its safety, but was reopened on Saturday. According to H. M. Flanders, general manager Springfield Street Railway, the greatest injury suffered by this company was loss of revenue due to suspension of service. Service on the Northampton Street Railway was suspended Saturday between Northampton and Amherst owing to submerged track in the Hadley meadows, and also between Northampton and Easthampton and southward to Mount Tom for the same reason.

Reports sent on Nov. 8 from Springfield, Mass., as a center indicated that service on the Springfield Street Railway would be completely restored on all lines on Nov. 9. Minor washouts had then been repaired. At that time the Holyoke street railway lines were open to all suburban points. The roadbeds on this system were found to be sound after the flood receded. Except for the route from North Adams to Bennington all the Berkshire street railway lines were operating.

$300,000,000 for Subways Approved in New York

Amendment No. 2, which was put forth as a solution of New York City's transit problem, was carried at the election on Nov. 8 by an indicated majority of approximately 140,000. The indicated majority in the five boroughs was 370,000 in favor of the measure, which would enable the city to borrow $300,000,000 beyond its present debt limitations, the money to be used solely for construction of new transit lines, particularly subways. The sweeping victory of the proposal in the city itself was impressive.

Mayor Walker said:

> I am very happy with the vindication at the hands of the people of this city manifested by the wonderful plurality given to Amendment No. 2. Now we can proceed to keep our platform pledges to complete the new subway routes and bring to subway riders of our city the comfort and convenience that has been altogether too long delayed.

Five-Cent Zones and Weekly Passes Ordered in Oakland

A basic 5-cent zone fare on all traction lines of the Key System Transit Company, Oakland, Cal., operative within 30 days or by Dec. 10, has been ordered by the California Railroad Commission. This ruling is in accordance with recommendations of A. G. Mott, chief engineer of the commission, filed on Nov. 2, the last day of the rate hear-

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ing which had been in progress intermittently for two years.

The Key System also was ordered to reduce ferry fares from 21 cents to 20 cents and to increase slightly monthly ferry commutation rates and to institute $1 and $1.50 weekly passes good for unlimited use on the so-called traction lines. Operation of one-man cars in the interest of economy also is recommended by the commission, as are 5-cent bargain fares in all former 7-cent zones between the hours of 9 a.m. and 4:30 p.m.

The new fare schedules are experimental and subject to modification from time to time. The rate base of the company as accepted by the commission is $29,101,063 and it is expected that the new rate schedules with suggested economies will increase the company's yearly net income about $1,000,000. Last year's net income was $1,195,079, a return of 4.11 per cent on the rate base.

Boston's New Dorchester Line Opened

$5,000,000 improvement first move in extensive plan under which city lines will take over suburban traffic from steam railroads

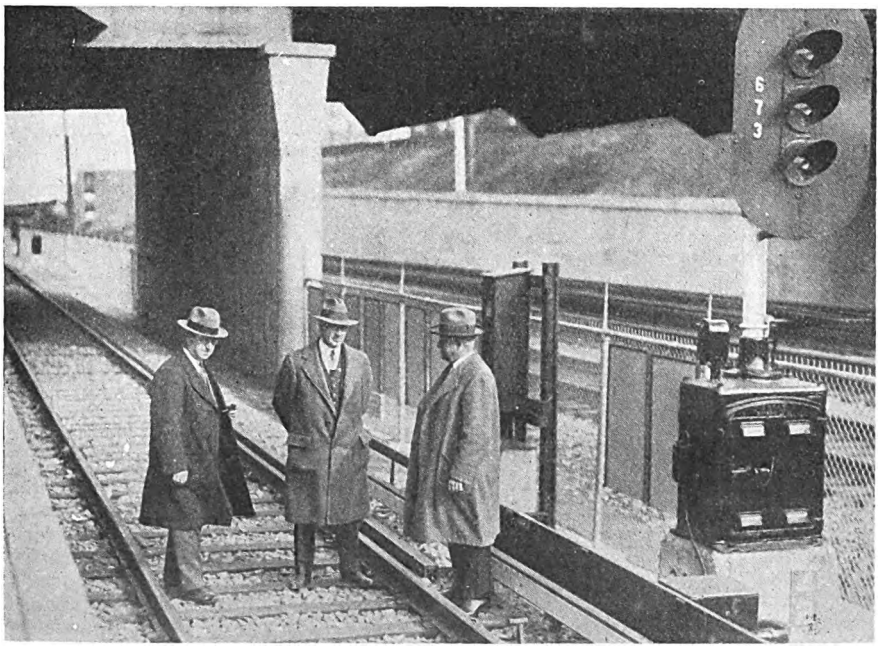
ANOTHER important branch has been added to the rapid transit system of the Boston Elevated Railway, Boston, Mass., by the opening, on Nov. 5, of the first section of the Dorchester tunnel extension. This extension runs from Andrew Square, which has been the terminal for some years, to Fields Corner in Dorchester and cost $5,000,000. It is being carried to Mattapan as fast as the work can be done, at an expense of another $5,000,000. To Fields Corner it is completed.

Mayor Malcolm E. Nichols drove the last spike with a gilded hammer on Wednesday, Nov. 2. Then the Massachusetts Public Utilities Department inspected the branch and orally certified to the Boston Elevated Railway that all the relevant laws had been complied with and the new line was safe for operation. On Friday, Nov. 4, there was an official inspection by the Boston Transit Commission, under which the line was built. These ceremonies served to dedicate the new line and at 5:20 o'clock the next morning, Nov. 5, it was opened to the general public for business.

The Boston Elevated crews had been operating empty trains over the new route for some days and were familiar with all the switches, signals, curves and grades, and they started service promptly and held their long four-car trains to schedule, running from Fields Corner to Park Street, in the very heart of Boston, in fourteen minutes. This speed is revolutionary for the Dorchester, Mattapan and Milton people, and in addition to the speed there is the frequency of service—a two and three-minute headway during the morning and afternoon rush for people who have been accustomed to infrequent steam train service to South Station and long walks to their offices. Most of them are brought much nearer to their places of business by being carried to Park Street.

Moreover, the commuters learned that the new line is a heavy, rock-ballasted, third-rail road, smooth riding and quiet. For a long distance the rapid transit tunnel trains run alongside of the main line of the New Haven Railroad, an iron fence separating them. In fact, the roadbed occupied is the former roadbed of the New Haven Railroad, purchased from the railroad by the Boston Elevated. It is the first outstanding bid of the Boston Elevated for the suburban passenger business of the New Haven Railroad and may lead to the abandonment of more of this short-haul business by the steam railroads entering Boston, in order that it may be more advantageously handled by the local railways, mainly the Boston Elevated.

Mayor Nichols says this is only the beginning of a great expansion of the Boston Elevated system. His intention is to go to the Legislature at the next session with a bill for at least $20,000,000 for new rapid transit lines. He wants to take up again the question of a subway under Huntington Avenue to connect the Brookline village with the Boston Elevated tunnel system and to run new lines out in other directions, details of which he has not worked out. "Let's get going," he says. He would have a subway under the Common into the North End and connection with Lechmere Square; he would have the city take over from the Elevated the elevated structure in Atlantic Avenue and use it in part as a highway for heavy trucks, and he expects that another tunnel will have to be built under the harbor to East Boston. Speedy development of the traffic system has become imperative in Boston to keep pace with the requirements. Governor Fuller has recommended that pleasure cars be kept out of the business center from 10 o'clock in the morning until 3 o'clock in the afternoon. General Manager Dana of the Boston Elevated approves of this plan, stating that the Boston Elevated is running light during that period and could handle all the traffic resulting from its adoption. The registrar of motor vehicles, Frank Goodwin, favors it.



Left to right: A. L. Butler, construction engineer of rapid transit Boston Elevated; Col. Thomas F. Sullivan, chairman Boston Transit Commission, and H. M. Steward, superintendent of maintenance Boston Elevated

Railway at Baltimore Concludes Presentation of Testimony

The United Railways & Electric Company, Baltimore, concluded its case before the Maryland Public Service Commission on Nov. 4. The hearing is on a petition asking authority to increase the straight fare from 7½ cents to 10 cents. Recently the commission refused to grant the company a temporary emergency increase pending hearing on the present petition seeking a permanent 10-cent fare.

Bancroft Hill, valuation engineer, was the last witness for the United. The company did not call any witnesses to present testimony to show the necessity for a return of 8 per cent, pointing out that testimony covering this point had been offered at the hearing for an emergency increase and this testimony is a part of the record of the present case.

The commission announced that the hearing will be resumed on Nov. 15, when the people's counsel, organizations and others opposing the increase will begin the presentation of their testimony.

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Maine Company Challenges the Transportation World

Considerable interest has been shown in the second industrial exhibit placed in the window of the Chamber of Commerce at Biddeford, Me., by the Biddeford & Saco Railroad. The material on display is valued at more than $500 and it is only a small fraction of the many thousand parts necessary for upkeep and maintenance of the road and no two parts on display are alike. The railroad makes a very pertinent challenge worded:

We challenge you to name another railway in America of like size serving a similar community that is still operating on a 5-cent fare and giving as good service as your own trolley.

Many savings banks own our bonds—you have money in these banks, boost your own investment by riding the street cars. Your local trolley system carried about 1,500,000 passengers last year, and it was an off year here too. Does that sound like a dying industry to you?

More people in America are riding the street car than ever before, why?—because it has been found to be cheaper and safer.

When talking with a visitor, you can justly point with pride to the local railway and its 5-cent fare since 1887.

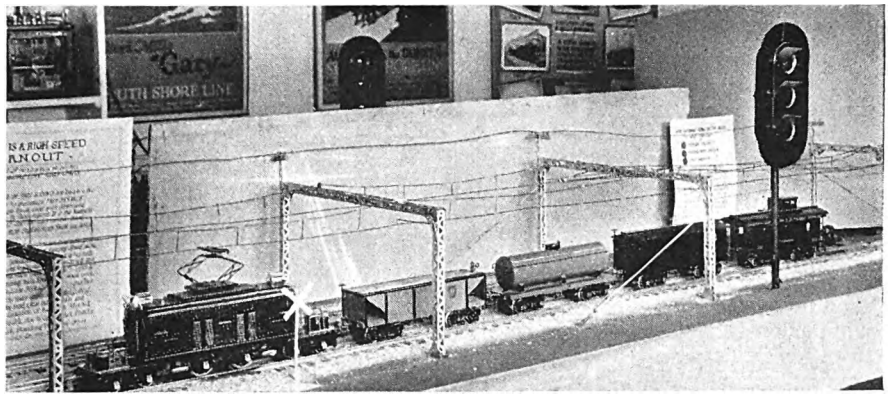
You can ride the street cars as frequently as desired for less than the depreciation alone on your auto costs. Gas, by the way, is the ninth item of expense in operation of an auto. Think this over.

Visitors say "Your Biddeford & Saco company has a set of men as polite and courteous as can be found anywhere. This is a real community compliment.

The exhibit by the railway is only a part of a series of displays, which will run into March of next year.

To Safeguard Jacksonville's Little Ones

Operators of the Jacksonville Traction Company, Jacksonville, Fla., have received special instructions from the management in the matter of taking extra precaution for the avoidance of accidents in which children would be the victims. Children who are compelled to use the streets going to and from school are to receive the special consideration of all car operators.



A close-up of the South Shore working model

Working Model of South Shore Line Attracts 50,000

So detailed and so fascinating that it was easily the center of interest at each exhibit, a working model of the Chicago, South Shore & South Bend Railroad was recently shown for a week at the Greater Gary Exposition in Gary, Ind., and for a like period at the East Chicago-Indiana Harbor Exposition conducted jointly by those two Indiana cities. In the two weeks it was viewed by at least 50,000 persons.

The model was equipped with both passenger trains and freight trains built especially for the South Shore Line. It had high-speed turnouts and switches and an exact reproduction of the signal system of the railroad, being actuated by a set of ten standard relays. To give an impressive demonstration of the operation of the road the trains were run over 65 ft. of track and through switches. The tracks were laid on wooden ties, spiked with tacks and ballasted with crushed stone.

Power was supplied to the trains through an especially constructed catenary overhead system suspended from structural bridges similar to those used on the road's right-of-way. Built in the shape of an oval with banked curves, the tracks allowed fast operation. Pantographs were built on the motor cars to collect the power for the trains. Lights in the interior of the cars added to the reality.

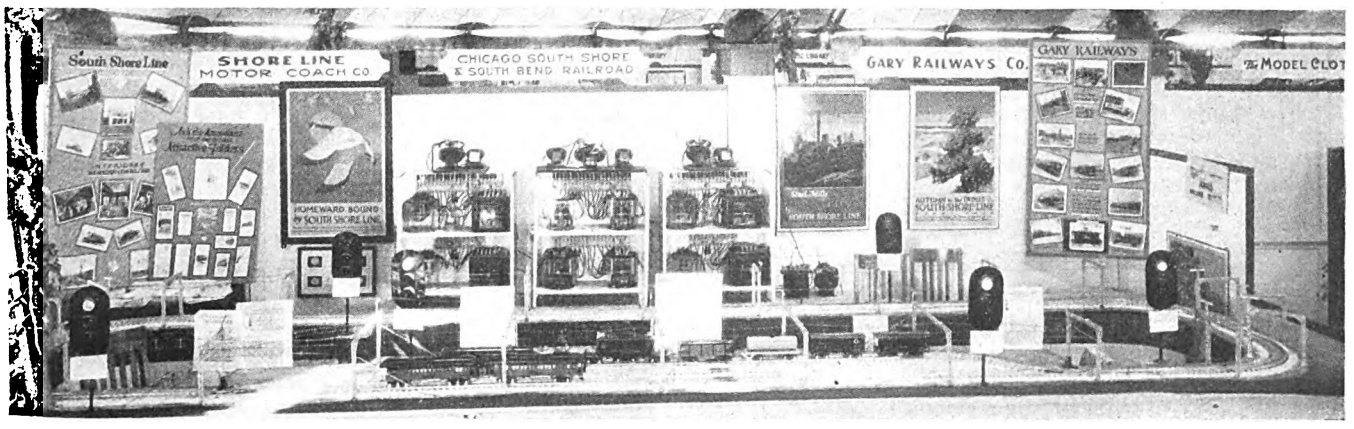
Track circuits of electricity operated the signals which flashed alternate green, yellow and red warnings as the trains sped around the oval. As one train passed a certain point the signals changed automatically and thus gave warning to the following train.

This interesting and instructive exhibit will soon be shown in other cities served by the South Shore Line. It was built and set up by Earl Stover of the electrical engineering department.

Rehabilitation Does Pay

Stockholders and friends of the Cincinnati, Hamilton & Dayton Railway have been handed a reprint of a series of editorials and articles from ELECTRIC RAILWAY JOURNAL commenting upon and describing the significance of the physical and financial rehabilitation of the road.

These editorials and articles were written at or about the time the Cincinnati, Hamilton & Dayton put into service its new equipment, but subsequent experience has served only to emphasize the conclusion therein expressed that fine equipment operated over a rehabilitated, modernized property would stimulate a popular response which would be most gratifying. It is the conviction of President Conway that the company's experience emphatically demonstrates that the public will patronize a high-class, modern interurban railroad in preference to other methods of transportation.



Not much was left out of the exhibit showing the South Shore company's activities

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Omaha Franchise Draft Rejected

Formal rejection has been made to the City Council of Omaha, Neb., of the proposed new franchise for the Omaha & Council Bluffs Street Railway. Six reasons are assigned for the refusal. The company points out that the franchise binds the company for 30 years to observe the provisions of the contract, while the city may amend it any time that it chooses. This creates a condition where the company is left without credit or security. It is shown that the grant would make inoperative any service orders of the State Railway Commission unless the Council approved. It is objected that the measure provides that the company shall be subject to limitations and burdens that may later be imposed by law without allowing it any of the benefits that future laws may give.

It is argued that the ordinance is unduly restrictive in that the company will be forced to ask the Council for permission to do many things purely managerial in character. Lastly, it is objected that under one section, if the bondholders thereafter should bring action to establish any pre-existing rights and the court should sustain such claim, the measure would immediately become void.

Increased Fare Talk in Dallas

The City Commission of Dallas, Tex., will oppose any effort on the part of the Dallas Railway & Terminal Company to increase fares. This was made known when events seemed to point to the possibility of action along these lines by the railway. The present 7-cent cash fare with five tokens for 30 cents was put in effect more than a year ago when what is known as Everman Plan No. 4 was approved. Everman Plan No. 4 called for certain improvements, extensions and betterments to be completed within a specified time in return for which the railway was authorized to put these fares into effect. The company has now been told that the city will not consider any proposal for any change in fares until Everman Plan No. 4 has been complied with in every detail. It will be January, 1928, before the company has completed these improvements.

New Fare Schedule in Muskogee

The State Corporation Commission of Oklahoma has granted the following new schedule of fares to the Muskogee Electric Traction Company, applying to city lines in Muskogee and interurban lines of the company: City cash fare 10 cents, three tickets for 25 cents; school children between six and fifteen years old between points in the city and to each of the two zones on the Hyde Park line and within each of the five zones on the Fort Gibson line 4 cents, providing that no less than 25 tickets be purchased at one time by each child; for continuous passage from points in the city to Hyde Park 20 cents and the same for return trip; cash fare of 10 cents within each of the two zones on the Hyde Park line with right to sell tickets for continuous passage between Muskogee and Hyde Park at 15 cents each, providing that no less than twenty tickets are purchased by each person at one time; from Muskogee to Fort Gibson 40 cents cash fare or 10 cents for each of the five zones on the line; for tickets between Muskogee and Riverside at end of the second zone on the line 15 cents each when not less than twenty tickets are purchased at one time.

Kings of Swat in New Surroundings

Baseball's most distinguished ambassadors, "Busting Babe" and "Larruping Lou," or Babe Ruth and Lou Gehrig of the New York Yankees, disported themselves recently on the front of a Milwaukee locomotive. The occasion was during a visit of the New York Yankees, new world champions of the baseball realm, to St. Paul for an exhibition game the latter part of the season. It so happened at the time that one of the giant Baldwin-Westinghouse electric locomotives used by the Chicago, St. Paul & Milwaukee Railway was on exhibition there in connection with the new roller bearing transcontinental limited of the Milwaukee road, then making a tour from Chicago to the coast. Among the visitors to the exhibition were "Busting Babe" and "Larruping Lou," and the camera caught these two stellar performers amid new surroundings.

Busting Babe and Larruping Lou in new rôles

Seven-Cent Fare in Michigan City

The Indiana Public Service Commission has authorized an increase from 5 to 7 cents in fares at Michigan City on petition of the Chicago, South Bend & Northern Indiana Railway, effective Nov. 15.

Municipal Railway Bond Issue Defeated in San Francisco

Once again the $4,600,000 Municipal Railway bond issue has failed to carry in San Francisco. Defeated last June, it was referred to the voters again on Nov. 8 and again it failed of the necessary votes. The vote was, for the bonds, 66,322; against the bonds, 46,871, or 8,807 votes short of the required two-thirds.

Opponents of the measure reiterated the arguments they advanced when the proposal was submitted in June. Some of the extensions proposed are unnecessary, it was claimed. Included in the bond issue was a proposal to buy fifteen new cars and to extend eight lines, including one bus line.

The railway bond measure, however, was more popular than a proposal for a $2,000,000 municipally owned Hetch Hetchy transmission power line. This measure failed by 16,413 votes of the necessary two-thirds.

Proponents of municipal ownership, however, are claiming a victory for these principles, pointing to the fact that a proposal to build a publicly owned bay bridge carried by 2,467 majority and a counter proposal to construct a privately owned bridge was defeated by nearly 9,000 votes.

Mayor James Rolph, Jr., was elected for the fifth successive term, by 30,936 votes, the largest majority he has ever received. He campaigned for the boulevard bonds, which measure carried, but he was silent on the railway bond issue. The vote was the heaviest ever cast at a San Francisco municipal election.

Eight-Cent Cash Fare in Tulsa

Fares are to be increased at once by the Tulsa Street Railway, Tulsa, Okla., under an order issued on Oct. 28 by the Corporation Commission. Following a hearing, F. E. Kennamer, judge of the United States court, Northern District, on Oct. 25 instructed the receiver to apply to the Corporation Commission for an increase in fares to the following schedule: Cash fare, 8 cents; two adult tickets 15 cents; children under twelve years 3 cents cash fare; school children's tickets 2½ cents. This schedule has been aproved by the Corporation Commission.

The schedule heretofore in effect has been 7 cents cash fare and four tickets for 25 cents; the fares applying to children were unchanged by the commission's ruling. The receiver in his application gave a comparative statement of revenues and expenditures of the company, which showed that expenditures, including operating expenses, taxes and bond interest, had exceeded operating revenues as follows: 1924, $44,225; 1925, $63,029; 1926, $62,682, and for the first nine months of 1927, $33,064.

The company has been in receivership since Oct. 19, 1925.

The present fare increase is the first since Jan. 10, 1921.

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Recent Bus Developments

For the Good of the Majority

City manager of Cincinnati lays down some transportation essentials for benefit of private car operators

THAT streets should be used under a plan best serving the people as a whole was the view held by Col. C. O. Sherrill, city manager of Cincinnati, Ohio, in his answer to a protest filed with the city against the proposed use by the Cincinnati Street Railway motor coaches of a recently completed section of Central Parkway.

The railway had applied for permission to use this boulevard for its Westwood motor coach route on the ground that by running over this street the line would have a more direct route to the business section.

CITIZENS HAVE EQUAL RIGHTS

A citizen sent a letter to the City Council asking that this privilege be refused. No action has been taken, but Colonel Sherrill in his answer to this protest discussed the prior rights of mass transportation when considered in connection with the rights of the driver of a private car. He said in part:

Every citizen in the bus has an equal right with every other citizen to purchase and drive his own automobile for his own personal convenience, if he so desires. The average number of persons per private automobile is less than two. It thus takes 500 automobiles to carry 1,000 persons. These automobiles are capable of carrying more persons and if something could be done to collect the 1,000 persons in 250 machines, the congestion would be materially reduced in proportion to the citizens served.

Public transportation offers a means of assembling a larger number of persons into one vehicle. There can be no question but that if buses and street cars were stopped today the vehicular congestion on the streets would be enormous tomorrow. One of the surest means of reducing congestion is so to improve collective and public transportation that for ordinary business trips to and from the congested area persons will leave their automobiles at home and ride the public conveyances. It is a misconception to feel that buses add to the congestion, and such misconception is based upon a viewpoint of individual desires, and not upon a viewpoint of the problem of transporting thousands of citizens.

It is doubtful if buses are a controlling factor in the rate at which traffic moves on our wider streets. But even here the problem is not the speed in miles per hour which an individual car may or may not be able to make for the convenience of some individual person, but the real measure of the rate of traffic movement is the length of time that it takes to move a thousand persons in or out of the city.

In the morning and evening rush hours there are thousands of citizens desiring transportation, and that method which can transport these citizens (all with equal rights) to their destination in the least time is better service to the city as a whole than is that method which might possibly allow one individual, concerned with running his own private car, to gain a minute or two of time.

In analyzing a problem of this kind it is important to look inside of the bus and see and recognize that it is carrying citizens, each one of whom has a right to consideration in the problems with which the city is confronted, and each one of whom has an equal right to have the vehicle on which he is riding occupy at least the same space and time that is occupied by a vehicle in which a single citizen is riding, even though that single citizen may own the vehicle. In the interests of the development of Cincinnati all streets should be used under those regulations which will best serve the people as a whole.

I am not at all convinced, as yet, that there is any benefit to citizens in buses using Central Parkway. But if it can be shown that those citizens can be better served by such a routing, then certainly they are entitled to consideration; and if it can further be shown that the very best possible transportation will persuade people to utilize collective agencies of transportation, then we have not only reduced congestion, but we have increased the capacity of the street and have increased the rate at which traffic, measured in thousands of persons per hour, can be handled.

Bronx Buses Begin Business

Legal bus operation under a franchise granted by the Board of Estimate of New York City and a certificate of convenience and necessity granted by the Transit Commission was begun in the Bronx on Nov. 1 by the Surface Transportation Corporation, a subsidiary of the Third Avenue Railway. Operation of six Bronx routes with a type of bus approved by the Board of Transportation was authorized on Oct. 31 by the passage of a resolution by the Board of Estimate. The effect of the resolution was to give an experimental period of 120 days for the use of a particular type of bus. Except for a few comparatively unimportant bus lines, mostly on the outskirts of the city, and the routes operated by the Fifth Avenue Coach Company, this is the first legalized bus operation for half a dozen years, the so-called emergency lines supervised by the Department of Plant and Structures being without legal warrant.

Bus Lines Not Warranted in California by Revenues Derived

The Key System Transit Company, Oakland, Cal., has applied to the California Railroad Commission for authority to abandon bus service between a terminus at Santa Clara Avenue and High Street in Alameda and a terminus at Ygnacio Avenue and High Street in Oakland, as not being warranted by the revenues derived. It is stated that the total revenue from this line from July 10, 1924, to June 1, 1927, was $6,958 and that the cost of operation was in excess of $41,000.

Taxis in Atlantic City Go to Mitten Management

Mitten Management, Inc., has taken over the operation of the Yellow Cab Company, Atlantic City, operating 118 cabs. Ownership of the Atlantic City company is vested in the People's Rapid Transit Company, intercity bus operator of Mitten Tours, a subsidiary of the Philadelphia Rapid Transit Company.

J. T. Smith, former assistant general manager of the Yellow Car Company, Philadelphia, is the newly appointed Yellow Cab manager in Atlantic City.

Selling Service in New Jersey

More than mere operators are the Public Service men who run the trolleys and buses. They are salesmen in a "highly competitive business" requiring for its success "the finest kind of selling ability." And, to get across their product, in competition with 500,000 automobiles, they must drive safely, be courteous, maintain schedules and give proper attention to passengers' convenience.

This is the thought in the latest executive bulletin, No. 64, issued on Nov. 1 by Matthew R. Boylan, vice-president of the Public Service Railway and the Transportation Companies to his salesmen-operators.

The operators are informed they must be on their toes every minute of their working time, because "good service is what sells local transportation."

"Every time you make a friend for your company you are selling transportation," Mr. Boylan tells them. "Every time you miss or run by a possible passenger, you neglect an opportunity to sell transportation."

Plea by Texas Line for Fare Increases

Application has been filed with the Texas Railroad Commission by the Texas Motor Coaches for permission to increase bus fares between Dallas and Fort Worth to 3¼ cents a mile. This would make the proposed fare $1.10, compared with 50 cents now charged. The fare by interurban between the cities is 90 cents.

In its application the coach carrier represents that lines are being run at a loss under the fare of 50 cents, put in effect during a rate war among the several companies. It is further represented that experience has shown that service cannot be given on bus lines in Texas with a fare less than 3¼ cents a mile. The case will be heard on Nov. 12.

The Texas Motor Coaches is the company recently organized under sponsorship of the Northern Texas Traction Company to control the operation of bus lines between these two cities purchased by the Stone & Webster interests.

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Financial and Corporate

Final Transfer of St. Louis Property Ahead

Arrangements were made recently to pay approximately $890,000 into the treasury of the St. Louis Public Service Company by Nov. 8 as the final installment on the common stock of the company. Within another 30 days the transfer of the properties of the United Railways to the new company will probably be made by Receiver Rolla Wells. When the final payment is made on its common stock the company will have received $3,076,812 from that source. This stock went to holders of United Railways preferred stock who exercised their option to purchase common stock in the new company under the reorganization plan. The new company will obtain $4,295,562 through the sale of common stock.

The St. Louis Public Service Company purchased the railway properties at foreclosure sale several weeks ago. The purchase has since been approved by the Missouri Public Service Commission.

Several important matters must be settled before the final transfer of the properties takes place. These include the election of permanent officers for the new company and the determination of its fixed policies. It is generally believed that Sam W. Greenland will be made operative executive for the new company. He has been identified with the work of the reorganization committee for several years and formerly was connected with the Indiana Service Corporation at Fort Wayne.

Indianapolis Decision Still Under Fire

The established rule of the Indiana Public Service Commission, which in the past has been that the statutes of the state do not permit one utility to issue securities for the purpose of buying stock in another, apparently will have to be violated when the commission completes the order by which it was instructed in the Circuit Court to approve the $500,000 note issue for the Indianapolis Street Railway to use in the purchase of capital stock of the Peoples Motor Coach Company.

Late in 1926 Arthur L. Gilliom, Attorney-General of Indiana, pointed out that there were only two ways by which change of ownership of going public utilities could be accomplished. One of these, he said, was under the statute which authorized consolidations and mergers with approval of the commission, provided the combined capital stock of the companies merged was not of greater proportion than the stock of the individual companies. The other method, he said, was for one utility to buy outright the used and useful property or business of another concern.

Mr. Gilliom took the position that the commission did not have legal authority to approve such transactions. On the other hand the commissioners said they must obey the court's order under fear of being in contempt of court.

In its ruling the commission held that the financing plan under which the railway proposed to issue $500,000 of 8 per cent notes for the purchase of capital stock in the bus company was unsound because of the high interest rate and expressed the opinion that the bus enterprise would suffer if it came under control of the railway.

The law under which it is possible to appeal from the commissioner's finding has been held unconstitutional by the Attorney-General but no party adverse to the revised method of procedure appeared in the appeal hearing to raise such a question.

Sale of Boston & Worcester Road Under Foreclosure Approved

Judge Sanderson of the Massachusetts Supreme Court has affirmed the sale of the Boston & Worcester Street Railway to Henry S. Rising, on the terms previously reported in the ELECTRIC RAILWAY JOURNAL. The Massachusetts Department of Public Utilities has authorized Mr. Rising and fifteen associates to organize and finance the new corporation which will operate this property under the name of Boston, Worcester & New York Street Railway. One reason for adopting a new name is that the inclusion of the name New York gives the company a wider business prospect, inducing a line of travel not suggested by the old name.

The Department of Public Utilities finds that a total capital of $3,034,000 does not exceed the cost of replacement of the property, or a fair value, and therefore approves a capital stock issue of $2,028,000. This is the amount of stock the new corporation asked for, with an understanding that it may issue bonds for $1,008,000.

16 Per Cent More Revenue from Higher Fares in Melbourne

Deficit in Australian City changed to surplus in year ended June 30, 1927. Operating ratio down to 70.92 per cent. Interesting comparable statement of earnings

THE Melbourne and Metropolitan Tramways Board has summarized its operations for the year ended June 30, 1927. The capital cost of the undertaking at June 30, 1927, was as follows:

Cable tramways	£1,865,462
Electric tramways	5,029,139
Motor omnibuses	119,472
	£7,014,073

During the year the board's expenditure upon the construction and reconstruction of tramways, conversion of cable tramways to electric traction, erection of buildings, construction of rolling stock, purchase of lands, and substation equipment, etc., amounted to £958,216.

Receipts from passenger fares totaled £2,487,573, compared with £2,142,234 for the preceding year, an increase of £345,339, or 16 per cent. This increase is due mainly to the revision of fares which took place on May 1, 1926, and to the additional revenue earned upon new tramway extensions and from the conversion of the Toorak and Chapel Street tramways to electric operation.

It is estimated that the revision of fares produced increased revenue to the extent of approximately £300,000 per annum.

The total operating expenses were £1,777,107, compared with £1,775,568 for the previous year, showing an increase of £1,539. The average total operating

CONDENSED STATEMENT OF INCOME AT MELBOURNE

Year to June 30, 1926			Year to June 30, 1927
£2,142,234	Traffic revenue		£2,487,573
10,694	Advertisements, rents, etc.		18,282
£2,152,928	Total revenue		£2,505,855
1,775,568	Less operating expenses		1,777,107
£ 377,360	Gross surplus		728,748
248,921	Less interest and other charges		299,359
£ 128,439	Available for appropriation		£429,389
	APPROPRIATIONS		
£104,393	Payments to State consolidated revenue	£108,453	
42,674	Transfer to loan redemption accounts	49,809	
3,699	Transfers to loan sinking funds	4,199	
	Transfer to renewals reserve fund	158,000	
218,650	Transfer to general reserve fund	100,000	
1,500	Transfer to fire insurance reserve	7,000	
370,916			427,461
£ 242,477	Deficit—Transferred from general reserve fund.	Surplus	£1,928

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MILEAGE OF TRAMWAY AT MELBOURNE

	Route-miles	
Cable	33.675	
Electric	102.142	
	135.817	
(Single-track, miles 256.848)		
Traffic Receipts:		
Cable	£1,004,794	
Electric	1,419,376	
Bus	63,403	£2,487,573
Traffic Receipts per Car-Mile	d.	Cents
Cable	24.56	(49.1)
Electric	25.45	(50.9)
Bus	14.78	(29.6)
Mileage Run:		
Cable	9,817,468	
Electric	13,387,869	
Bus	1,029,796	24,235,133
Average Speed Per Hour Including Stops:		
Cable	9.41 miles	
Electric	11.09 miles	
Bus	9.91 miles	
Passengers Carried:		
Cable	99,978,416	
Electric	118,858,967	
Bus	5,374,484	224,211,867
Number of Tramcars:		
Cable dummies	407	
Cable trailers	387	
Electric cars	438	
Number of employes	5,955	

expenses per vehicle-mile, including power cost, was 17.599 d. (35.2 cents) as against 17.392 d. (34.8 cents) for the previous year, while the proportion of operating expenses to total revenue is 70.92 per cent as against 82.47 per cent last year.

Deducting the total operating expenses from the income a gross profit of £728,748 is shown, made up as follows:

Cable tramways		£310,197
Electric tramways		465,457
		775,654
Less operating loss on buses		46,906
Gross profit on operation		£728,748

The statement on page 920 shows in condensed form the income and expenditure and the appropriation of the gross surplus on operation for the year under review compared with that of the previous year.

Since the inception of the board a total of £744,310 has thus been paid to the state government consolidated revenue. This sum, applied as it has been to non-tramway purposes, more than counterbalances the total deficit of previous years, amounting to £600,187.

The board's total indebtedness in respect of loans June 30, 1927, was	£4,677,939
Deduct loan sinking funds invested in government securities	68,802
	£4,609,137

The reserve funds were as under:	
Renewals reserve account	£ 57,104
General reserve account	100,262
Public risk reserve account	20,852
Fire insurance reserve account	39,270
Loan redemption accounts	200,160
Guarantee fund	7,783
	£ 425,431

With the exception of the guarantee fund, all the above reserves are invested in the board's undertaking.

The payments to the consolidated revenue of the State of Victoria under Section 88 of the act in respect of the Metropolitan Fire Brigades Board, Queen's Memorial Infectious Diseases Hospital and the Publicans' Licensing Equivalent were the highest since the inception of the board, totaling £108,453, as compared with the sum of £70,000, the estimated annual contribution at the time of the passing of the board's principal act.

The 224,211,867 passengers carried last year compared with 234,064,148 for the previous year, an apparent decrease of 4.2 per cent. This decrease is, however, due in part to the loss of one-zone riders and partly to the increase of through services following cable electrification, whereby counting the same rider twice has been eliminated.

Commission Allows B.-M.T. Issue

To enable the company to pay for new cars and other equipment, the Transit Commission has authorized an issue by the New York Rapid Transit Corporation, affiliated with the Brooklyn-Manhattan Transit Corporation, of a bond issue of $17,000,000 to be sold at not less than 94. The bonds will be issued under the New York Rapid Transit Corporation's refunding mortgage and will be known as refunding mortgage 6 per cent sinking fund bonds, series B, to be dated July 1, 1927, and to mature July 1, 1968. The bonds are to be redeemable in whole or in part on any interest payment date at 105.

Better Report by Schenectady Property

The net corporate loss of the Schenectady Railway, Schenectady, N. Y., for the quarter ended Sept. 30 was cut down nearly $100,000 when compared with the corresponding quarter of 1926, according to the report filed with the Public Service Commission. A decrease of $23,000 in operating revenue was more than offset by a decrease of $126,000 in operating expenses.

The comparative figures of earnings of the company for the third quarter of the two years follow:

	1926	1927
Operating revenues	$407,326	$384,296
Operating expenses	456,484	330,206
	$49,159*	$54,090
Net corporate loss after deducting taxes assignable to railway operations, fixed charges, etc.	$131,120	$ 36,686

*Loss.

Decline in Traffic in Baltimore

For the first eight months of 1927 the United Railways & Electric Company, Baltimore, Md., carried 145,256,760 passengers, against 148,870,529 passengers for a similar period of 1926. During the first six months 111,351,246 passengers were carried, against 113,715,254 for the first six months of the year previous.

$2,000,000 Omaha Bond Issue Offered

Ames, Emerich & Company, Inc., Chicago and New York, offered for subscription on Nov. 7 $2,000,000 of Omaha & Council Bluffs Railway & Bridge Company first mortgage 6 per cent sinking fund gold bonds due Oct. 1, 1947. The offering price was 100 and accrued interest to yield 6 per cent.

The bonds are secured, as just indicated, by a first closed mortgage on all the fixed properties of the bridge company, valued in recent appraisals at a net sound value of $5,482,477. The present bond issue in effect represents a 75 per cent loan against the bridge alone and a 37 per cent loan against the value of the bridge and the railway system. The bankers pointed out that the attractiveness of the issue was further enhanced by provisions of a sinking fund which will operate to retire more than half the issue before maturity.

The Omaha & Council Bluffs Railway & Bridge Company owns a toll bridge across the Missouri River, linking Omaha and Council Bluffs. This is the only bridge between the two centers of population, and across it flows a steady stream of pedestrians, vehicular and rail traffic. Forming an indispensable medium of communication and connection, the bridge has become a permanent factor in the economic life of the two cities.

Average annual net earnings of the bridge property from toll receipts, after depreciation, for the last five years were $327,845, as compared with annual interest requirements on this issue of $120,000. Net earnings in 1926 were equal to more than 3.19 times annual interest requirements. For the first eight months of 1927 net earnings showed a substantial increase over the similar period last year and were at the rate of 3.52 times interest charges.

In approving the Omaha issue the Nebraska State Railway Commission branded as subversive of all government the plea of Senator Howell that it write its own valuation basis "until the courts come in agreement." Mr. Howell led the city into public ownership of gas and water plants and he is now seeking to force the railway to sell the bridge to the city at a low figure as part of the price of a new railway franchise. He urged that the original cost of the bridge, which he placed at $1,500,000, be held as its present fair value.

The commission says it is not concerned with the future ownership of the bridge; that the company had presented the finding of a federal court master in chancery that it owns $4,800,000 of property; that reliable engineers testified that its present fair value is $2,673,000, and having demonstrated that a proper relationship exists between stocks and bonds, the commission will authorize the issue. The bonds are to replace an outstanding issue of 5 per cent bonds. The price set by the commission was not less than 93½ per cent of par.

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Receiver Authorized to Issue Securities

Robert W. Perkins, receiver of the Shore Line Electric Railway, New London, Conn., has been ordered by the court to sell $50,000 of the Groton & Stonington Traction Company 6 per cent twenty-year income gold bonds and 997 shares of stock of the company at a specified price that will yield 80 per cent of the face value of the bonds and stock.

Decision Against Chicago Railways Certificate Holders

Efforts of participation-certificate holders to win a voice in the conduct of the affairs of the Chicago Railways, Chicago, Ill., by a petition filed in the federal court, seeking to intervene in the receivership proceedings, have been ruled out by Judge Wilkerson, sponsor for the properties under the receivership.

$600,000 Bond Issue Sought by Gary Railways

In a petition filed on Nov. 1 with the Indiana Public Service Commission at Indianapolis the Gary Railways requested authority to issue and sell $600,000 of 6½ per cent mortgage bonds at not less than 92 per cent of par. Receipts from the sale of this issue, the petition states, are to be used to reimburse the company's treasury for money expended for additions and betterments completed since Nov. 1, 1925.

Scrapping of Maryland Line Under Way

The work of scrapping the Cumberland & Westernport Electric Railway, Cumberland, Md., built in 1901, extending through the Georges Creek mining valley from Cumberland to Westernport, 30 miles, has begun. The S. Snyder Corporation, Rochester, N. Y., has contracted with the Cumberland & Westernport Transit Company for the removal of all railroad ties, trolley wires and poles and the dismantling of the power house at Clarysville.

Increase in Revenue Passengers in Winnipeg

During the eight months of 1927 the Winnipeg Electric Company, Winnipeg, Canada, carried 2,251,818 more revenue passengers than in the corresponding eight months period in 1926, showing an increase of 6.1 per cent. In reporting on the past quarter President McLimont said that this improvement could be attributed to various factors, among which were the increased industrial activity, providing more employment and consequently more railway patrons, and the steady flow of immigrants and tourists going to Winnipeg and the West.

Book Reviews

America Comes of Age

By André Siegfried. New York, N. Y.: Harcourt, Brace & Company. 358 pages. Price, $3.

No more romantic rôle is being played in America today than that of laborer and no more interesting tale of his character and viewpoint than that told by André Siegfried, a frank and fearless Frenchman, who sees this country now at maturity. Willing to use machinery, the American workman has a different conception when the situation calls for the use of his hands. He looks for quick results and quicker returns. In such respects does he differ from the European worker who prides himself on the skill and patience which effect perfection in the smallest and most inconspicuous products. To understand American workmen and the present living standards in the United States one must go back and see the prologue to this great American drama.

Through a continental's unbiased and unemotional eyes we learn something of the efforts at amalgamating 100,000,000 people in these United States, their origins and religions and their ultimate assimilation in the great melting pot. The youth and pioneering days of America are over; she has entered upon maturity. This writer asks what of her economic status, her political imbroglios, her international relationships, her individual standing; what of her negro problem and the yellow peril; what is she contributing to civilization and what of her future? Herein is revealed a comprehensive and intimate study of all classes, creeds and color which make up America—a survey which required a review of its psychological, economic and political problems.

In discussing the spirit and methods of American industry, the writer mentions as important points our home market of 120,000,000 people, making this the most protectionist country in the world, and to our area of 3,000,000 square miles, constituting the largest entirely free market in the world. Mass production is the logical result. In our organization and standardization of industry he sees subtle influences at work—scientific advertising, the doctrine of "service," efficiency, waste elimination in the smallest details of manufacturing. In the latter detail he refers to the significant efforts of the Department of Commerce to reduce the number of different types produced by each industry and to concentrate on a limited number of standard sizes and shapes in the desire to terminate the chaotic condition that has existed. Investigations showed that there were 66 shapes of bricks which could be reduced to seven; 175 kinds of automobile wheels which could be reduced to four, and 287 kinds of tires reducible to 32. Such simplifications were immediately adopted.

But Mr. Siegfried, the author, has done more than expatiate on the problems facing this country now that her days of philandering are over. Gently he chides us on our goal—merely successful careers with little heed for the "relaxation of meditation and culture." Of course he sees wonderful strides made in materialistic fields, but he also sees retrogression and sacrifice from the point of view of individual refinement and art. "Even the humblest European sees in art an aristocratic symbol of his own personality, and modern America has no national art and does not even feel the need of one."

Whether or not one agrees with Mr. Siegfried, he can admit the author's straightforwardness and see something provocative in the question he puts in the form of a declaration, "So the discussion broadens until it becomes a dialogue, as it were, between Ford and Ghandi."

Electrical Directory of Australia and New Zealand, 1927 Edition

Tait Publishing Company, Pty., Ltd., Melbourne, Sydney. 264 pages. Price 7s. 6d. and oversea postage 1s.

Valuable statistics on the tramway operations in Melbourne, Sydney and Kalgoorlie, Australia, and in Auckland. Christchurch and New Plymouth, New Zealand, are included in the seventh edition of this electrical handbook. For reference work it serves as a complete and comprehensive document on electric lighting and tramway undertakings in that part of the world. A new feature of this issue, which is larger than its predecessor, is in the shape of maps showing certain supply areas.

New England Economic Situation

Comparison of conditions in New England with other sections of the nation. School of Business Administration, Harvard University, Chicago: A. W. Shaw Company. 260 pages.

Nine papers prepared by the undergraduate students of economics in the School of Business Administration, Harvard University, are contained in this book. These studies discuss wealth, capital invested in railroad developments, influence of legislative regulation upon the relative growth of national banks, state banks and trust companies; wage earner and his saving deposits; the future of the automobile industry, and four New England industries—cotton, woolen and worsted, boots and shoes, and hosiery and knit goods. The financial, banking and industrial aspects of New England are therefore covered in much detail. The studies include a historical background and provide material for comparison with conditions in the rest of the country.

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Personal Items

E. J. Anderson Heads Iowa Operators

E. J. Anderson, general superintendent of the Tri-City Railway, Davenport, Iowa, was elected chairman of the operators' section of the Iowa Electric Railway Association at the recent meeting of that body in Davenport. He is in charge of the company's line in both Illinois and Iowa.

Mr. Anderson has been connected with the company at Davenport more than twenty years. He entered the service there as a conductor. To Mr. Anderson other fields did not look greener than his own. He was content to wait and work. His value to his company did not long go unrecognized, and soon after he entered the service of the company there began for him a series of promotions through various intervening ranks until his elevation some time ago to the post he now occupies.

E. J. Anderson

His company has been one of the type hardest hit under the changed economic conditions since the war, but Mr. Anderson has never faltered in his fealty to the industry of which he is a part or in his faith in the company by which he has been employed. The high esteem in which this operator who has risen from the ranks to an executive post is held by his associates in the industry of which he is a part is attested by their election of him to the post of greatest honor it is within their power to confer.

William Finn Promoted in St. Louis

William Finn, roadmaster of the city lines of the United Railways, St. Louis, Mo., has been promoted to a higher position, with additional authority, and has assumed the newly created title of superintendent of roadway. This honor came to Mr. Finn on the 25th anniversary of his appointment as roadmaster and after a record of 42 years of service. Although a commercial career was planned for him, he soon got enamored of transportation and became connected with the Old Missouri Railroad in St. Louis. This company now is one of the units of the United Railways. After the cable system began operations in St. Louis, Mr. Finn for eleven years was active in the position of track foreman, in which he handled important construction projects. When all the competing systems in the city were consolidated, Mr. Finn was taken over in the big merger.

New Quarters for B.-M. T. Mechanical Department —Staff Changes

The office force for the mechanical department of the Brooklyn-Manhattan Transit Corporation, headed by William G. Gove, superintendent of equipment, moved into its new office structure last week. This is one of the large group of buildings which constitute the Coney Island repair shops. The enlarged organization required for carrying on the work at the new shops made necessary several new appointments and duties of other heads of departments were changed in some cases. On Nov. 4 Mr. Gove announced the following appointments and reappointments:

RAPID TRANSIT DIVISION

Repair Shops

Coney Island general repair—T. F. Delaney, superintendent; D. D. Owens, general foreman; S. Vrendenburg, general foreman.

Coney Island electrical repair—E. C. Parham, general foreman.

East New York and 36th Street shops—P. J. Kenny, general foreman.

Thirty-ninth Street (elevated)—J. F. Doherty, general foreman.

Inspection Shops

Coney Island office of superintendent of rapid transit—I. M. Burns, superintendent.

Coney Island inspection (subway)—J. G. McIntyre, general foreman; J. A. Grace, assistant general foreman; J. Connolly, night foreman.

East New York (subway and elevated)—C. I. Ekerman, general foreman; J. C. Heiberg, assistant general foreman; P. J. King, night foreman.

Montrose Avenue (subway)—L. E. Pfeifer, foreman.

36th Street (elevated)—M. J. Costigan, foreman; A. Reventlow, night foreman.

Queens Plaza (elevated)—G. J. Beirlein, foreman.

SURFACE DIVISION

Superintendent of surface line shops—Niles Persons.

Repair Shop

DeKalb—E. R. Pike, superintendent.

Inspection Shops

Superintendent—George Siebert.

Bergen Street—J. F. Schultz, foreman; A. J. Fisher, night foreman.

Canarsie—J. C. Weir, foreman; E. G. Weingarten, night foreman.

DeKalb—J. Krieger, foreman; J. H. Hayman, night foreman.

East New York—W. F. White, foreman; E. Wetzel, night foreman.

Ninth Avenue—J. E. Myers, foreman; J. Hanbury, night foreman.

Twenty-third Street—M. F. Hutt, foreman; A. Scott, night foreman.

Twenty-fourth Street garage shop—C. L. Knight, foreman; W. L. Swezey, night foreman.

Supervising inspector—P. S. Scott.

OBITUARY

George Stanton

George Stanton, widely and favorably known among the officials and engineers of both steam and electric railroads throughout the country, died on Oct. 20 in Cleveland, Ohio.

Mr. Stanton's association with railroad men began about 40 years ago, when he was with the Grand Rapids & Indiana Railway. He left this company after some years of service with it to go into sales work, which line he followed for more than 35 years. He was connected with the U. S. Wind Engine Company, Batavia, for a long time and next was with the Q. & C. Company, Chicago, for nearly ten years. Early in 1904 he went with the Cleveland Frog & Crossing Company as manager of sales, and was still serving in that capacity when he died.

George Stanton

JASON C. CAMERON, connected at one time in an official capacity with the Brooklyn City Railroad, died at Rutherford, N. J., recently. After seeing service in the Civil War he became associated in Brooklyn transit management, which occupied his attention for 30 years. He assisted in supervising the work involved in the change from horse cars to electric power and had charge of the company forces during the strike of 1896. Mr. Cameron later became general manager of the White Line Railway Company, operating in Hoboken. He retired in 1910. He was born in Vermont 85 years ago.

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Manufactures *and the* Markets

New $50,000 Station for Busy Division Point in Chicago

Construction work on a new $50,000 elevated station on the south side division at 63d and Halsted Streets, it is reported, has been launched by the Chicago Rapid Transit Company, Chicago, Ill. The old structure at this point, one of the busiest on the system, it is understood was not adequate.

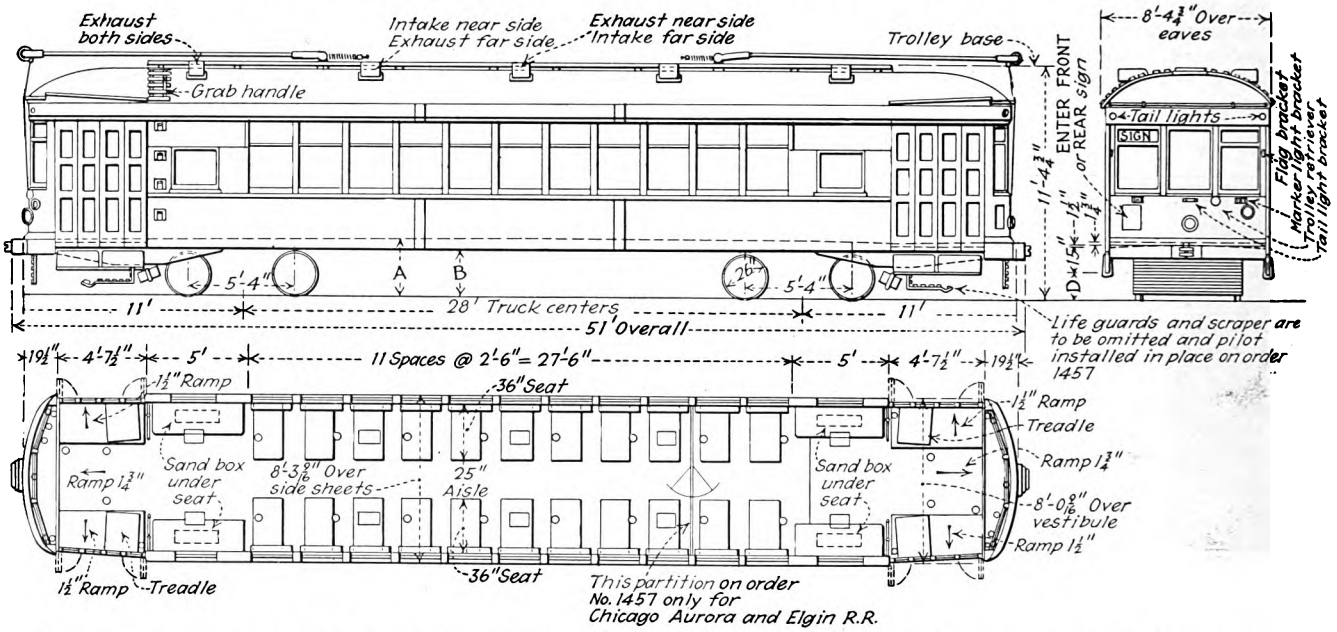
Similar in design to the new standard type of station buildings of the Rapid Transit Lines the new structure will contain many improved facilities and when completed about Dec. 1 it will be one of the finest of the new buildings erected by the "L" lines in recent years. Two entrances, one on Halsted Street and the other on 63d Street, will furnish added accessibility to patrons.

The exterior of the building is pleasingly designed in white terra cotta with old English mission style brick panels.

Two Freight Engines and Four Cabooses for South Shore Line

Two additional 80-ton locomotives for main line freight service were ordered Sept. 26 by the Chicago, South Shore & South Bend Railroad. The new locomotives, which will closely duplicate the first four to be placed in service on the South Shore Line more than a year ago, will be built by the Baldwin Locomotive Works and equipped by the Westing-

North Shore Line and C., A. & E. Car Order Nearing Completion



Typical seating plan and elevation (with the exception of smoking compartment) of the nine cars ordered by the Chicago, North Shore & Milwaukee Railroad for Milwaukee city service, and one unit ordered by the Chicago, Aurora & Elgin Railroad to be used in interurban shuttle service between Batavia Junction and Batavia

Work on the ten one-man, two-man, double-end cars ordered by the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., specifications for which were published in the JOURNAL for July 16, was rapidly nearing completion in October. The order was placed with the St. Louis Car Company, St. Louis, Mo. Recent advices were to the effect that nine of the units would be placed in city service in Milwaukee, Wis., and that the other unit of interurban type was ordered by the Chicago, Aurora & Elgin Railroad, Aurora, Ill., and will be used in shuttle service between Batavia Junction and Batavia. This unit varies in specifications from the other nine cars as follows: The interior trim is of dark brown walnut, motor equipment is 40 hp. instead of 35, and there has been provided a 20-ft. smoking compartment. The accompanying plan is typical of the ten units with the exception of the partition which divides the smoking section. Each unit will have an over-all length of 51 ft. As previously announced, two cars will have Timken roller bearings.

In its issue of Oct. 15 the JOURNAL inadvertently published what was thought to be a duplication of this order.

Following are revised specifications covering the ten units with the exception noted above:

Name of railway	Chicago, North Shore & Milwaukee Railroad and Chicago, Aurora & Elgin Railroad
City and state	Chicago, Ill., and Aurora, Ill.
Number of units	Ten
Type of unit	Nine one-man, two-man, motor, passenger, city, double-end, double-truck, and one interurban type
Number of seats	56
Builder of car body	St. Louis Car Company
Date of order	Aug. 5
Date of delivery	Nov. 1
Weight, total, approximately	40,000 lb.
Bolster centers	28 ft. 0 in.
Length over all	51 ft. 0 in.
Length over body posts	37 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4⅞ in.
Height, rail to trolley base	11 ft. 6¼ in.
Window post spacing	32 in.
Body	Steel and wood
Roof	Arch
Air Brakes	Westinghouse Traction Brake Company
Armature bearings	Plain
Axles	3¼ x 6 in.
Car signal system	Faraday high voltage
Compressors	Westinghouse DH-16
Conduit	Metal
Control	General Electric K-35 with line breaker
Curtain fixtures	National Lock Washer Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	End, folding, with treadle control
Energy saving device	Economy meter
Fare boxes	Johnson Coin Box Company
Finish	Duco
Gears and pinions	General Electric, grade M spur
Glass	Plate
Hand brakes	North Shore
Hand straps	Rico
Heat insulating material	Cork
Heaters	Railway Utility Company
Headlights	Golden Glow SM-95
Headlining	Haskelite, cream
Interior trim	Nine light mahogany and one dark brown walnut
Journal bearings	Eight cars plain, two cars Timken roller
Journal boxes	St. Louis 3¼ x 6 in.
Lamp fixtures	Adams & Westlake
Motors	Four General Electric, inside hung, No. 265-A, 35-hp., and No. 265-A, 40-hp.
Painting scheme	Orange and maroon
Registers	Tuttle & Bailey
Roof material	Canvas and wood
Safety car devices	National Pneumatic Company
Sash fixtures	O. M. Edwards
Seats	Hale-Kilburn No. 300
Seat spacing	32 in.
Seating material	L. C. Chase, grade C mohair plush
Side bearings	Stucki
Slack adjusters	Turnbuckle
Steps	Folding
Trolley catchers	Knutson No. 5
Trolley base	U. S. 20-C
Trolley wheels	More-Jones
Trucks	St. Louis Car Co. EIB-64
Ventilators	Railway Utility Company
Wheels, type	Rolled steel, 26 in.
Wheelguards	H-B life guards

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house Electric & Manufacturing Company. They will have a capacity of 1,280 hp. and cost about $56,000 each.

With the delivery of the new locomotives, about March 1 of next year, the freight motive power equipment of the South Shore Line will be increased to eight units. The last addition to engine equipment was made about six months ago, when two 53-ton Baldwin-Westinghouse locomotives were placed in switching service.

Commenting on the company's recent order, Charles H. Jones, general manager of the South Shore Line, said recently:

Maintenance of our fast schedule and overnight delivery service between Chicago and South Bend, coupled with the rapidly growing carload business from all parts of the United States, makes this addition to our motive power equipment imperative.

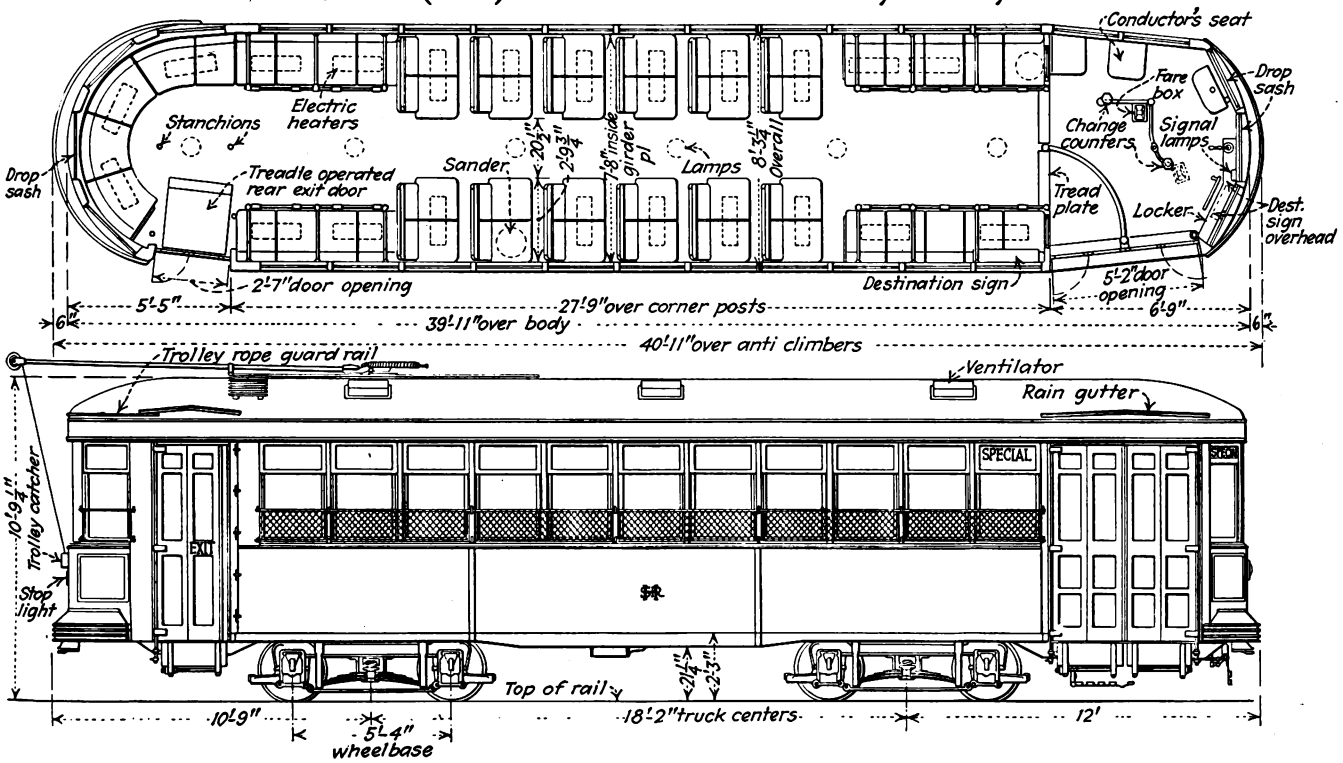
Coincident with the ordering of the new locomotives, the railroad placed orders with the American Car & Foundry Company for four new cabooses. They will be placed in service as soon as delivered by the manufacturer.

Two Officials of White Motor Company Resign

The directors of the White Motor Company at their meeting Nov. 4 voted a dividend of 50 cents per share instead of $1 per share as heretofore. The present declaration is at the rate of 4 per cent per annum. The dividend is payable Dec. 31 to stockholders of record Dec. 15.

Windsor T. White, chairman of the board, and Thomas H. White, vice-president, desired to be relieved of their

Hamilton (Ont.) Units Scheduled for Delivery on May 1



General seating plan and elevation of twelve units ordered by the Hamilton Street Railway, Hamilton, Ont., from the National Steel Car Corporation, Ltd.

Specifications have recently been released for twelve one-man, two-man, passenger, city-type, single-end, double-truck cars which were ordered in July by the Hamilton Street Railway, Hamilton, Ont., from the National Steel Car Corporation, Ltd., of that city. Mention of this order was made in the JOURNAL for Aug. 27, the first advices being that twenty cars had been ordered.

The units will have an over-all length of 40 ft. 11 in. and are designed to seat 53 passengers, five of whom can be accommodated in the gunboat rear end of the unit. The body framing will be of steel and wood with Plymetl girder plates, aluminum letter plate, stanchions and fittings. Haskelite headlining has been specified, as have Westinghouse No. 510 A-F inside-hung type L motors. Each unit will weigh 37,000 lb. Special devices are Meissner No. 267 sanders, automatic tail lights (red and green), and rear treadle exit doors. The interior trim will be of birch stained mahogany. May 1, 1928, has been set as the date of delivery. The cars are very similar to those recently ordered by the Montreal Tramways. Following are specifications released by O. H. Anderson, chief mechanical engineer the National Steel Car Corporation, Ltd.:

Name of railway	Hamilton Street Railway
City and state	Hamilton, Ont., Canada
Number of units	12
Type of unit	One-man, two-man, motor, passenger, city, single end, double truck
Number of seats	53
Builder of car body, National Steel Car Corporation, Limited	
City and state	Hamilton, Ontario
Date of order	July 29, 1927
Date of delivery	May 1, 1928
Weights:	
Car body	24,300 lb.
Trucks	12,700 lb.
Total	37,000 lb.
Bolster centers	18 ft. 2 in.
Length over all	40 ft. 11 in.
Length over body posts	39 ft. 11 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3½ in.
Height, rail to trolley base	10 ft. 9½ in.
Window post spacing	27 in.
Body	Semi-steel
Roof	Arch
Air brakes	Westinghouse single end safety control, with variable load device roller
Armature bearings	Roller
Axles	O.H.S. 3½ x 7 in.
Car signal system	Consolid. Car Htg. Co. buzzer equipment
Compressors	West. 600 V.D.H. 16, motor driven
Conduit	Metal
Control	West. M-35-XB
Destination signs	E. & E. spiral drive
Door mechanism	National Pneumatic Co.'s
Doors	End, folding
Fare boxes	Cleveland Model 5
Finish	Lacquer
Floor covering	Painted
Gears and pinions	Solid forged B. P. Helical
Glass	Windows—plate; doors—wired
Hand brakes	Peacock staffless type
Hand straps	Sanitary rigid retrieving type
Heat insulating material	One-ply Salamander
Heaters	Consol. Car Htg. Co.'s C-12331-G2, with thermostatic control
Headlights	Golden Glow R.M.L.-96, 600 volt
Headlining	Haskelite
Interior trim	Birch—stained mahogany
Journal bearings	A.R.A. 3½ x 7 in.
Journal boxes	3½ x 7-in. pedestal type, Symington Co.
Lamp fixtures	Automatic compensating E.S.S. Co. type "L"
Motors	West. No. 510-A-S, No. 4
Painting scheme	Green below belt, cream above belt
Roof material	Haskelite and canvas
Safety car devices	H. & B. life guards
Sash fixtures	Edwards brass sash, complete
Seating material	Spanish leather
Slack adjusters	West., Form E-1
Steps	Folding
Step treads	"Visabledg" Safkar treads
Trolley catchers	O.B. No. 13141
Trolley base	U. S. No. 13
Trolley wheels	U. S. No. 31
Trucks	C. S. side frame
Ventilators	Nichols-Lintern type C
Wheels	Solid forged, diameter 26 in.
Special devices	Meissner No. 267, Sanders automatic tail lights (red and green), rear treadle exit door

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offices because their views differed from those of the board concerning future policies of the company. Their resignations as officers, but not as directors, were accepted with regret.

Walter C. White, president, continues as the company's chief executive officer.

National Pneumatic to Furnish Macon Door Equipment

The National Pneumatic Company announces that it has been awarded the order for furnishing the door mechanism that will be used in the twelve cars being constructed by the Perley A. Thomas Car Company for the Macon Light & Railway Company, Macon, Ga. Specifications of these units were printed in the Oct. 15 issue of the ELECTRIC RAILWAY JOURNAL.

Copper More Buoyant—Zinc Weaker

Copper is more buoyant than for many months, and large sales at advancing prices are the feature of the non-ferrous metal markets. Zinc, on the other hand, continues to show weakness, and price concessions have been made by anxious sellers to get business. Shading of prices by second hands is reported in lead, which is only moderately active. Tin is easier.

Both domestic and foreign buying of copper have been excellent during the week ended Nov. 9, and prices are better. Not for a long time have there been two active weeks in succession in the domestic copper market. The past week, however, not only follows a very good week, but is the third in the last four in which sales have been excellent. Some 13¼-cent copper remained in the market on Nov. 3, but since then only a few small sales were made under 13⅜ cents and these were offset by occasional lots which brought a little more than the even ⅜ figure. Most of the producers were asking 13.50 cents Nov. 9, but business has been slim indeed. A large proportion of the buying was on account of wire drawing companies, which is an encouraging development because wire has been the weak spot in the copper market for several months. Most of the business was for delivery in November and December, but January and even February was represented. Copper exporters advanced its price again to 13.80 cents c.i.f. and offers in the f.a.s. market are available at 13.50 and 13.55 cents.

Though the principal sellers of lead have made no change in their quotations, which remain at 6.25 cents in New York and 6 cents, St. Louis, these prices have been shaded to some extent and the market cannot be called firm. The principal unsteadying influence is the weakness in London, though prices there have shown marked resistance to further decline whenever the price for prompt metal reaches £20⅛. Though the American Smelting & Refining Company contract price remains at 6.25 cents, New York, an occasional lot has been sold at 6.20 and 6.225 cents. In the Middle West dealers have sold as low as 5.975 cents. The market has been rather inactive.

Sellers of zinc do not appear to be overly optimistic and they have been cutting prices during the week to get business. On Nov. 8 and 9 sales were made at 5.60 cents and it is possible that this may have been shaded. High-grade has been sold at 7.75 cents, New York, for small lots of spot metal.

The tin market has been quiet all week, and prices have declined to below 57 cents, the lowest level reached since the middle of 1925. On Nov. 9 price of prompt Straits was 56¼ cents, with far-forward shipment about ¾ cent less.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Nov. 8, 1927
Copper, electrolytic, cents per lb.	*13.15
Copper wire, cents per lb.	*15.25
Lead, cents per lb.	* 6.225
Zinc, cents per lb.	* 6.00
Tin, Straits, cents per lb.	*56.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.075
Somerset mine run, Boston, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.55
Central, Ill., screenings, Chicago, net tons	1.125
Kansas screenings, Kansas City, net tons	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	*5.50
Weatherproof wire base, N.Y., cents per lb.	*16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.0
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.52

*Nov. 7 prices.

TRACK AND LINE

NORTHERN TEXAS TRACTION COMPANY, Fort Worth, Tex., has begun improvement work on the Arlington Heights car line between Montgomery and Sanguinet Streets. The work consists in lowering the double track line to the new level of the street which will obtain when the city's paving program is carried out, laying of new track and ties where replacements are needed, paving of street intersections and installation of modern ornamental steel poles between the tracks to carry the trolley wires. The cost is placed at $125,000.

TRADE NOTES

ANACONDA COPPER MINING COMPANY, New York, announces that C. S. Anderson has been appointed electrical engineer for rod, wire and cable products. Mr. Anderson was formerly sponsor engineer of the Electric Bond & Share Company, New York, for Louisiana, Mississippi and Arkansas.

GEORGE N. BROWN, formerly vice-president and sales manager of the Pittsburgh Transformer Company, has joined the Ohio Brass Company as manager of high-tension sales. Mr. Brown was graduated from Cornell in electrical engineering and, until the World War, was with the New York State Railways. He served overseas in the army and upon his return to civil life started with the Pittsburgh Transformer Company.

WHITE COMPANY, Cleveland, Ohio, recently opened its new branch sales and service building in Los Angeles, Cal. The building, of cement and brick construction, is located at 435 East Twentieth St., with entrances on Washington Boulevard and Maple Avenue. It has 132,000 sq.ft. of floor space and is equipped with most modern shop machinery and service facilities. It was constructed at a cost of $500,000. Four other White branches that were being constructed at that time, in the Bronx, N. Y.; Providence, R. I.; Hartford, Conn., and Syracuse, N. Y., were expected to be ready for occupancy during November.

ADVERTISING LITERATURE

BAKER-RAULANG COMPANY, Cleveland, Ohio, has issued bulletin No. 110, describing the Baker "railroad special" bus bodies.

CANADIAN NATIONAL SAFETY LEAGUE, Toronto, has issued three illustrated bulletins entitled "Make Haste Slowly," "Use a Flashlight, It Is Safer" and "The Everlasting Question—Why?" confined to safety on construction work, the prevention of fires and automobile accidents, respectively.

ALLEN-BRADLEY COMPANY, Milwaukee, Wis., has issued a series of bulletins describing: Type J-3064 automatic slip-ring motor starter, H-1864 slip-ring motor starter, H-2052 semi-automatic resistance starter, J-1552 alternating-current contactor, E-2100 and E-2200 controlling rheostats, J-1552 Form B across-the-line starting switch and J-1552 Form R and RM alternating-current reversing switch. In the text the important features of the apparatus are stressed, application, operation and construction being specifically treated in some instances.

ROLLER-SMITH COMPANY, New York City, has issued supplement No. 1 to bulletin No. 300 describing type Com ohmmeter and type HTD circuit tester.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued the following loose-leaf bulletins: Type FT normal starting torque for full voltage starting general purpose squirrel cage motors, CR7009-W3 magnetic reversing switches and CR7009-W4 for alternating current, CR2927 pressure and vacuum switches for a.c. and d.c. circuits, and CR4771 and CR4772 duplex controllers for constant-speed d.c. motors driving pumps.

OHIO BRASS COMPANY, Mansfield, Ohio, has issued folder 143 CB stressing the importance of small economies. Among the products pictured and described in it are O-B trolley retriever, form 4 base; trolley catcher, section insulator, and portable arc welder.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 *New York, Saturday, November 19, 1927* *Number* 21

Choosing Winter Grade Oil Intelligently

MUCH electric railway equipment operated in the United States is exposed to low temperatures during the winter season and under such conditions lubrication becomes a difficult problem. All of the lubricating oils become sluggish at low temperatures, some even to the point of solidification. With the normal flow of lubricants interrupted the moving surfaces in contact are subjected to increased wear due to the lack of lubrication.

It has now become general practice to change the oil used to a winter grade as soon as cold weather approaches. The amount of solidification in oil depends to a large extent on the base used and the content of paraffin wax. In general, lubricating oils refined from naphthenic base crudes in which the paraffin wax content is low, or sometimes even negligible, will show a considerably lower pour test, or temperature of congealment, than those refined from paraffin base crudes unless the latter are suitably chilled and otherwise treated for wax removal in the course of refinement.

Another important point that should be looked after during cold weather is the possibility of ice formation in the lubricating system. Present-day lubricating oils are water free when received from manufacturers, but sometimes, with improper storage, water may gain entry to the oil house or storeroom due to careless exposure of an oil drum to the weather, or to the activities of some laborer in cleaning the oil house. It is good practice never to use a hose in an oil house where lubricants are stored.

Water will settle to the bottom of any lubricating system and will freeze should the temperature drop sufficiently. The resulting ice of course impairs the lubrication and occasionally actually stops the flow of oil. To meet cold weather conditions be sure to have the proper grade of water-free lubricant.

Does Rail Co-operation Jeopardize Bus Sales?

THOUGH rather carefully worded to avoid a blunt statement of the ideas which it seeks to raise in the minds of its automotive manufacturer readers, *Automotive Industries,* in its issue of Nov. 12, obviously questions the wisdom, from the bus manufacturer's viewpoint, of sales policies based on a continuation of co-operation with electric railways. The article dissects in detail the report of the committee on motor vehicle information recently presented at the Cleveland convention, with the avowed object of showing that the report contains "phraseology and viewpoint most of which is generally associated with a group engaged and interested primarily in a contest or a fight rather than with a group interested primarily in study and development of the most efficient and economic form of transportation for the American public."

If this were the real object of the article the inferences regarding the attitude of electric railways toward buses might in some respects be worthy of careful thought, even though—as the author himself almost admits—the article builds a fabric of generalizations regarding the electric railway attitude as a whole, from disconnected words and phrases hand picked from a particular report. If the object of the article were really to promote the application of sound principles of economics in the determination of transportation policy in the public interest, then at least its intent would be above question regardless of how greatly electric railway men might differ with its inferred conclusions.

It is to the very last paragraph of the article, however, that we must look for its real purpose. Quoting from a similar article published in *Automotive Industries* of Jan. 22, 1927, it says: "It has become increasingly apparent to those interested in promoting the use and sale of motor buses that maximum utilization of such vehicles is unlikely to be reached by leaving to agencies fundamentally opposed to their use the determination of where they are and where they are not suitable." Thus, the maximum utilization of motor buses as such, regardless of whether or not existing rail service in a given territory is satisfactorily and economically meeting the public demands for service, is taken by the writer to be sound policy for those interested in manufacturing and selling buses.

Such a viewpoint is at considerable variance with accepted modern principles of sound merchandising policy. The responsible bus manufacturer is building for tomorrow as well as for today. With that in mind his interest in his product does not cease when the sale is made. Not only must he make money in the manufacture and sale of buses, to stay in business, but his customer, as well, must make money in their operation. Otherwise the market for buses wouldn't last long. To put this another way, the manufacturer is interested—or should be—not only in finding a market for his product, but in sustaining and expanding that market.

The electric railways have proved to be a desirable market for buses, both from the standpoint of volume of purchases and of credit considerations. To that fact, and that fact alone, is attributable the growing co-operation between bus manufacturers and the railways. There is no altruism in this arrangement. There isn't even public spirit in it. It is merely downright, hard-headed good business, and bus manufacturers proved that to themselves by costly experience before the present degree of co-operation was brought about.

What, then, is the answer to the questions raised by

This is the issue in November that is devoted essentially to maintenance and construction subjects

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Automotive Industries? Buses are sold to be operated at a profit. Their continued sale does not depend on the whim or the prejudices of any particular group of operators, *but on the ability of the automotive vehicle to earn a continuing profit while discharging in full the obligations of a common carrier.* Wherever and whenever they can do that successfully in co-ordination with existing rail lines they will be used by railway operators, and the prejudices of any particular individual or group will not check even temporarily the inexorable working of economic law. Wherever buses can do this more successfully than can rail lines they will replace rails regardless of whether or not existing operating managements are friendly or unfriendly to their use.

All this, however, is entirely a different matter than the ruthless destruction of existing rail investment by the competition of buses which are not prepared to assume the full obligations of the service which they destroy. It is different than making money with buses by operating them on selected routes representing the cream of the traffic in a given community while the railway continues to carry the burden of rendering a complete transportation service. So clearly are these matters now understood by railway operators, responsible bus manufacturers and regulatory officials that their statement here is almost unnecessary, except by way of clearing up the innuendos contained in the article under discussion, which appear to be directed toward breaking down that co-operation between the automotive and electric railway industries which has been built only through several years of earnest effort by both groups.

But where, then, is the bus manufacturer to look for a continuance and increase in his market? He doesn't need to look far. Some of the more progressive manufacturers are already finding the answer. The bus industry is in a sense entering a new stage. Blunderbuss manufacturing and selling are giving way to scientific design and application. What was formerly merely a bus is today becoming a specialized vehicle for a particular kind of service. This is opening to the bus manufacturer new uses for his vehicles and to the railway man new opportunities for extending the field of his service—*at a profit.* In these last three words lies the alpha and the omega of the bus problem. If the bus manufacturer will concentrate on finding out all there is to know about how to make money with buses discharging in full the responsibilities of a public transportation agency, he needs to worry little about the words and phrases contained in any particular committee report.

Now Is the Time to Check Air Piping

SOME properties have operated the same air equipment on their cars for years without troubles due to climatic changes. Standard inspections have been given and the only change made in the maintenance schedule during the winter months has been to drain the air reservoirs more frequently. However, on modern cars with pneumatic safety devices and on the old cars when similar devices were installed trouble began to develop during cold weather due to moisture freezing in the pneumatic apparatus.

During the past winter some railways spent considerable money for various anti-freeze compounds. Others found it necessary to organize blow-torch brigades to thaw out frozen valves and other parts on the road. As a result the service suffered from frequent interruptions and the maintenance expense went to abnormal heights. This condition automatically caused a certain feeling of uncertainty in regard to pneumatic safety appliances. In a great many instances the trouble could have been avoided had the apparatus been installed in the proper manner.

Now that the severe winter operating conditions are near at hand it is well to check up on the air equipment and rectify any faults which might cause a repetition of some of the troubles experienced the past winter. For instance, care should be taken to see that all of the piping is installed so as to prevent the formation of water pockets and that all the pipes drain toward a common point. With this taken care of and suitable cooling coils installed a great many of the service interruptions due to pneumatic freeze-ups will be obviated.

Where Saving With Home-Made Devices Was an Expense

SOME surprising comparisons have been made by one large city railway system between the cost of making its own overhead line materials and the cost when purchased from a manufacturer. This company for years made its own overhead materials, but more recently has been purchasing similar material from a leading manufacturer. During the first six months of 1924 rigid cross-overs made by the company required 220 replacements, while for the same period in 1927 only 29 replacements were necessary with the rigid cross-overs purchased from the manufacturer. Home-made adjustable cross-overs required 262 replacements during the first six months of 1924, while in the first six months of 1927 only 82 of the manufacturer's adjustable cross-overs were needed.

In the first half of 1924 861 home-made copper splicing sleeves were used, while in the 1927 half year only 303 of the manufacturer's splicers were needed. In this instance the railway is still in the process of replacing the old sleeves with the manufactured product, so that the ultimate difference between the requirements for splicers of the two types will be greater after all the home-made ones have been taken out of service.

As to the effect on continuity of service, the difference has been marked. Substitution of manufactured trolley ears for a home-made mechanical clip on the downtown heavy traffic streets has been accompanied by a reduction of emergency calls for ear troubles from more than two a week to none in a period exceeding three months. Frogs purchased from a local foundry cost $5, as compared with $8 for a well-known commercial type. But the $8 frog repeatedly demonstrated its ability to outlive the local foundry frog by giving three times the length of service. Thus the apparent saving of $3 for one frog was really a loss of $7 for material alone without taking into account the cost of installing two additional frogs to make the local product give a life equivalent to that of one frog manufactured by the specialist.

Most important of all is the relationship between these various devices used in the overhead line and the number of trolley wire breaks. In the year 1919 this company had 141 breaks. By 1926 this had gone down to 81 breaks, and in 1927 there were only 28 breaks in the first eight months, compared with 56 in a similar period of last year. This progressive improvement is at least in considerable part due to the lessened wear and burning of the wire, showing that the manufacturer had utilized in his designs the broad experience gained from a study of his devices as used on many properties.

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An Interesting Experiment in Fares

CONSIDERABLE importance attaches to the change in fares on the Key System Transit Company's lines which was ordered by the California Railroad Commission on Nov. 11. With insufficient revenue, the company in January, 1926, obtained an increase on its city lines from the 6-cent fare, which had been in effect for several years, to 7 cents in the hope of getting more revenue. The increase was only about one-fourth of the amount needed, so that the new plan has been devised in the hope of gaining the amount which was desired when the present fare was adopted nearly two years ago.

The new plan, which goes into effect on Dec. 10, is an innovation in this country. Briefly, it calls for a 10-cent cash fare, a 5-cent short-haul fare good all hours in each of two areas, a $1 weekly pass and an off-peak cash fare of 5 cents between the hours of 9 a.m. and 4:30 p.m. A $1.50 weekly pass, good in two or three zones, also is a part of the plan.

Frankly, the basic idea is that this combination of high cash fare with reduced rates for off-peak riders and regular customers will so increase the traffic on the line that the revenue will be much greater than before. The chief engineer of the commission estimates that the increase in revenue due to the off-peak fare of 5 cents will be anywhere from 25 per cent to 100 per cent. There is no precedent in this country on which to base an opinion. There is a somewhat similar off-peak fare on the lines of the London County Council Tramways, although conditions there are widely different because the system is almost entirely in competitive territory. Moreover, there is no combination with the weekly pass as in the present instance. The commission evidently regards the plan as an experiment and that the rates will have to be changed again if the results fall below expectations. Whatever the outcome, it will be awaited with interest by the entire industry.

Discarding Surplus Material Is an Economy

MANY good housewives have attics filled with surplus material from days gone by. That old bonnet may some day be made over for one of the girls, when the style comes back, and in a few years Johnny may be able to wear father's cast-off pants unless the moths get to them first. Courage is necessary when one decides to throw away something that appears perfectly good and which may be of value some time in the future. Only the bravest, realizing that in future years a new generation might find the discarded relics and put them in the fire, will call in the old clothes man and take the few cents he offers.

So it is with the stores department of the average railway. Materials and parts are ordered for some specific purpose, and to insure that repairs can be made without delay there is a small surplus kept on hand. Finally the motor, the truck or the car is discarded and a new type takes its place. Often, the stock of repair parts is retained on the shelves, taking valuable space and keeping alive a set of ledger accounts for the unused material. It is too good to throw out as scrap, and yet the chance that it ever will be used for its original purpose, or even for any purpose, is practically nil.

The committee on purchases and stores of the Engineering Association in its 1927 report realized this situation, for it has made a careful analysis of the problem. The committee recommends, first of all, that a company endeavor to dispose of surplus materials through company subsidiaries or nearby companies; if that fails, to advertise in trade papers or seek an outlet through second-hand dealers. As a last resort the material should be scrapped.

As to the results, the committee finds that one large company during a period of three years has worked along these lines and disposed of many thousands of dollars' worth of surplus stock at prices running from 39 to 50 per cent of the ledger value, while other companies have obtained equally satisfactory results. Surely a subject so carefully analyzed is not open to debate. Every storekeeper in the industry who has not already done so should at once start to clean house.

Red-Headed Mary Smith, Alias Mae Smythe

PAINT has many purposes. Most of them are utilitarian. "Save the Surface and You Save All" has seeped in as a practical slogan paying dividends in dollars saved. Although in the past railways have not been sparing of paint, their car color schemes have had somber hues. That was considered good practice. It was economical. It was a matter of paint considered entirely from the utilitarian point of view. It took no account of increased visibility; neither did it take into account the possible passenger pulling power of color. In their over-emphasis on usefulness, the railways failed to be color conscious. Their equipment merely mirrored the thinking of their day, that allurement and attractiveness were on a different plane from utility, and not on too high a plane either.

The most recent riot of color is better than the somber hues of the past, provided the contrast is not too pronounced. A street car in desert sand, deep cream, pyramid gray and red fire served only to remind a wag of the girl who talks about her "auburn tresses" and signs herself "Mae Smythe," but whom he knew for better or for worse as "that red-headed Mary Smith." Of course, there was a little affectation in Mary Smith assuming the rôle she did, but even affectation is a good thing if it is not carried too far. And so it is with the railways. Isn't it a little more alluring to proclaim to the public that a car is desert sand than to say that it is reddish gray? Isn't it much better to say that an assemblage is a gang, if it really is the latter and not the former?

But if paint has its purposes in industry when spread on the outside, it also has its so-called internal uses. These were discovered long ago in connection with the problem of interior illumination in shop and office. And now comes the use of color in the painting of machinery. One of the first of these apostles was the man who painted his linotype machines and printing presses white. He was a pioneer. But he won many votaries. The latest of these is the man who has announced the choice of ornate colors for the machinery in his electric railway shop. The color scheme to be adopted is apparently still in the making, but what if he does decide his lathes shall be in lavender, his borers in blue and his wheel press in pink? Of course, they will still be the same tools, but they will take on added prestige. Are things any the worse for a little bit of attitudinizing? We know Mary, if we know her at all, for what she is. And so it is with things utilitarian. We are not likely to be defrauded and mistake for something else a street car in pyramid gray or a lathe in lavender. It is a mauve age. White houses with green shutters have not passed out entirely. Let us use colorful words in describing the hues that are chosen, but let the painting go on.

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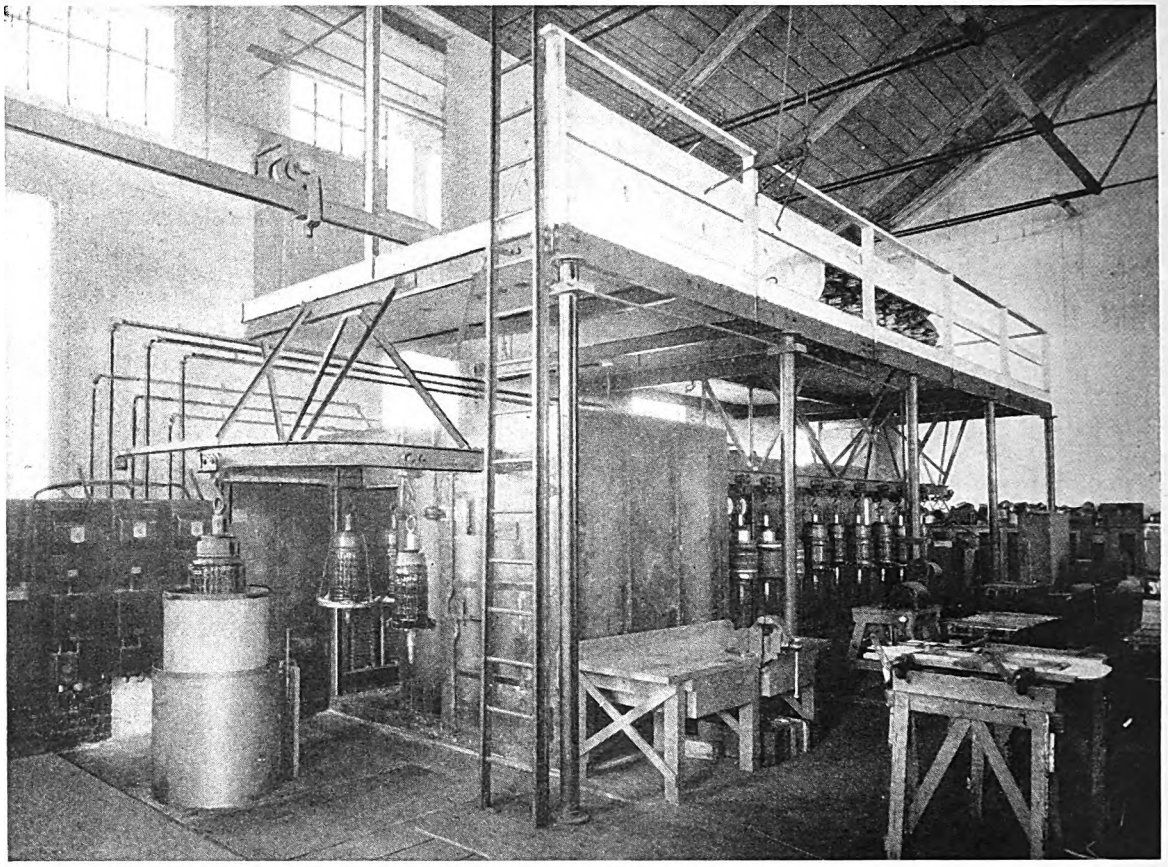

An I-beam traveling system passes through the ovens and out the rear end

Dipping and Baking Practice

at Los Angeles

Monorail system from dipping tank through oven handles armatures and other heavy parts. Careful cleaning and testing are important features of motor maintenance

ON AN average 140 motors per month are overhauled in the shops of the Los Angeles Railway, Los Angeles, Cal. Repairs and maintenance to motors are given close attention by this railway as these parts of the car equipment are exposed to the dust of the roadbed and extremes of moisture. As a result the insulating elements are deteriorating continually and if not properly cared for the insulation breaks down. The resulting short circuits of this nature probably account for a greater proportion of the entire motor failures than all other causes combined. The overhauling system of the railway provides that motors will be shopped periodically and by following this practice the number of breakdowns in service has been reduced to a minimum.

When a car is brought into the shop for overhauling, motors are dismounted, the armatures are removed and the windings are uncovered. Dust is blown out by compressed air and oil and grease are removed. The armature shaft is then drilled and tapped in the commutator end to take a suspension hook which is used for transporting the armature during the dipping and baking which follow. Armatures weigh from 300 lb. to 590 lb.

After the preliminary cleaning, the armature is given a thorough test to determine whether rewinding is necessary. Where the windings are but partially damaged and stripping and rewinding are unnecessary, the proper repairs are made and the armature is then given the regular varnishing and baking. Whether windings are repaired or not, every armature is dried out thoroughly, varnished and baked before it leaves the shop.

To protect the pinion end of the armature shaft a light sheet metal cup is placed over it before the armature goes to the varnish vat, obviating cleaning after the baking. A quite elaborate I-beam overhead monorail system has been installed. The armatures are suspended from the trolleys by the hooks in the ends of the armature shafts. The details of this construction were published in Electric Railway Journal for May 21, 1927, page 897.

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In preparing armatures for varnishing, they are given a preliminary baking in the oven. This preheating requires some twelve hours and it is considered important to keep the temperature at 205 deg. F. In specially wound armatures or coils the cotton covering of the wire usually contains an appreciable amount of moisture, which should be driven off before varnishing. This is also true to a limited extent in armatures where the windings have not been renewed. The preheating also expands the air inside the coils and promotes deeper varnish penetration than could be obtained otherwise. The preheating further makes it possible to reduce the period of varnish baking.

Armatures are removed one at a time from the preheating oven and are removed by the overhead trolley to the dipping tanks, which are raised by hydraulic pressure. The armature remains stationary and the raising of the tank submerges the armature up to the level of the commutator. An armature is allowed to remain in the varnish twenty minutes, after which the tank is lowered. The armature, after being allowed to drip, is then pushed into the baking oven, where it remains for 48 hours. The baking temperature varies with the size of the armature between 200 deg. and 250 deg. F. It is found that this temperature does not injure the cotton covering of the wire and that in 48 hours the varnish is not only well dried but thoroughly oxidized. The protective film produced is tough and moisture proof.

The baking of the dipped armature is considered one of the most important of the series of operations. Underbaking will leave the varnish soft and liable to be thrown off by centrifugal force when the armature is placed in service, leaving it unprotected and out of balance. The solvents and thinners remaining in under-baked portions also decrease the dielectric strength and are apt to promote deterioration in both the fabric and insulation. Over-baking of insulation represents an economic loss in the heat consumed beyond that necessary, but, more important still, it also tends to shorten the effective life of the varnish in service. It is therefore considered very important in baking to maintain the proper oven temperature and to hold all parts of the oven at the same temperature to get uniformity of bake throughout. The fumes and gases from the volatile oils driven off by heat are removed immediately in order to maintain the most effective drying conditions in the oven. Oxygen in sufficient quantity must be available in order properly to oxidize the heavier oils in the varnish compound.

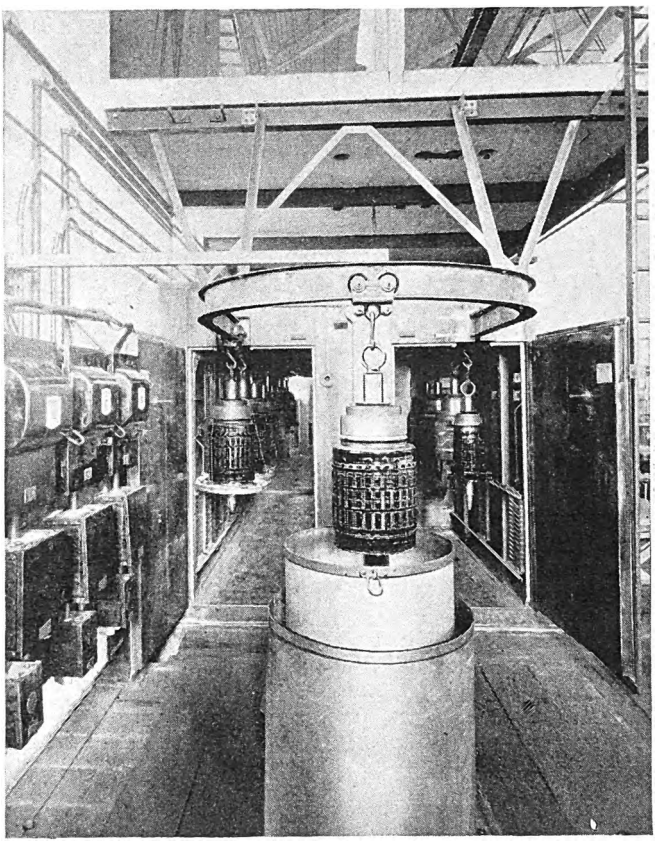
Another important factor in securing satisfactory results is to maintain the varnish at proper consistency and free from foreign substances. This is not difficult if proper attention is given.

The oven equipment used by the Los Angeles Railway was furnished by the Young Brothers Company, Detroit, Mich. The equipment includes a three-compartment, insulated, steel-panel oven. The long compartment is divided in the center, with swinging doors to permit a reduction of capacity when the number of armatures is below normal. Each compartment is 4 ft. 6 in. wide by 7 ft. 9 in. high with double doors at the end 3 ft. by 6 ft. 6 in. The preheating compartment is 7 ft. 6 in. long, while the two varnish baking compartments have a combined length of 30 ft.

The oven walls are 2 in. thick and the preheating compartment has a capacity of four of the larger armatures or six of the smaller ones. The 30-ft. baking compartment will hold 24 of the smaller armatures or twenty of the larger size.

The preheating oven is heated by six General Electric units connected in delta with a total load of 22.8 kw. The baking oven carries eighteen General Electric units connected partially in Y and partially in delta with a total load of 53 kw. The location of the heaters in each oven provides correct heat distribution throughout the interior and insures that each armature has the same heat intensity.

The current supply to the heaters is regulated by automatic control and the temperature is retained uniformly without drop except when the doors are opened to admit freshly dipped armatures or to remove completely baked units. The drying oven is ventilated entirely by adjustable roof ducts, while in the baking oven there is a balanced system of roof and floor ducts. Each half of the bake oven has a stack with a sump just over the oven roof for cleaning.



The dipping tank is at the front end of the ovens

The ventilation of ovens in which electrical insulating compound is baked must satisfy at least two main requirements. The vaporized chemical driers and lighter oils may be either inflammable or explosive, depending on their density, and air mixtures must be diluted and removed in such a way as to prevent their becoming a fire menace. Sufficient air must also be admitted to effect a satisfactory oxidation of the heavier oils to produce a tough, impervious exterior film on the completed armature.

The building program of the Los Angeles Railway provides for a new armature winding shop. When this is built the ovens will be moved into it. Consequently, in choosing the oven for this work, proper consideration was given to the type which could be removed at a minimum expense. This and the low cost of operation were deciding factors in the choice of this particular type of oven.

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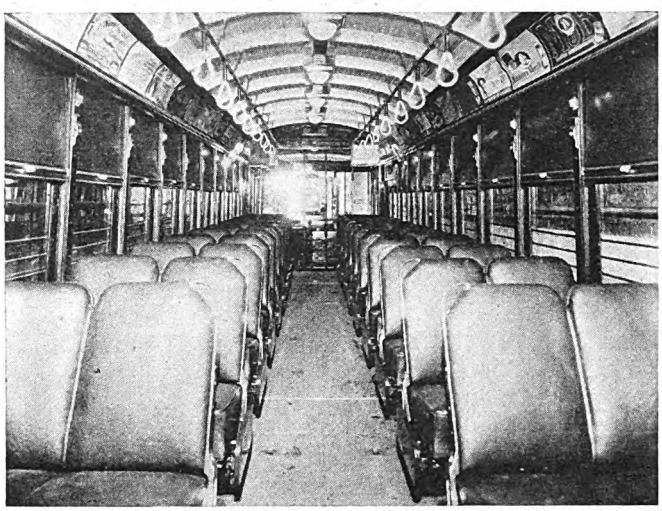
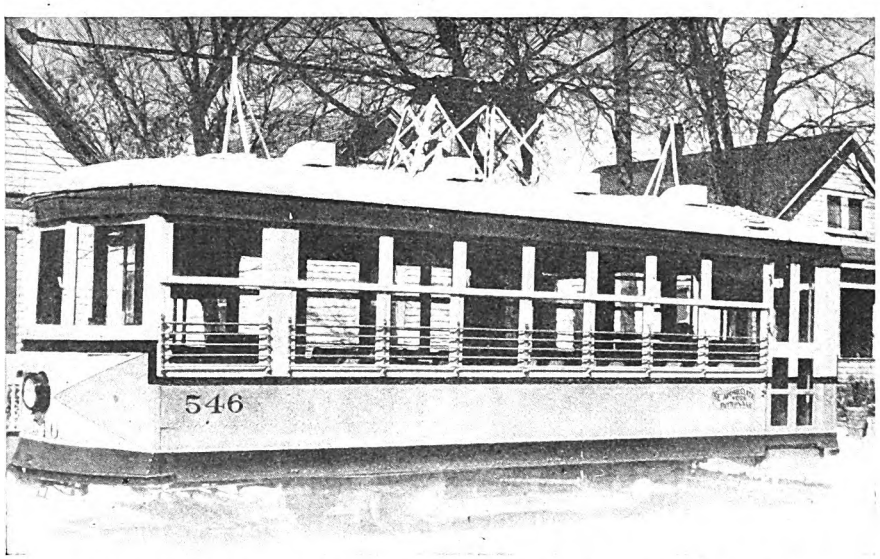
Fort Worth Rehabilitates Cars

IN ITS campaign this year for "more riders and more revenue" the Northern Texas Traction Company, Fort Worth, Tex., has carried on a car rehabilitation campaign, according to its brief in the Coffin contest for 1927. This has included both its interurban and city service. In an article on page 246 of the issue of this paper for Feb. 5 George Hoskins, master mechanic of the company, described the latest type of interurban car used by the company between Fort Worth and Dallas and known as the "Crimson Flier." Coincidentally with the improvements made in its interurban rolling stock, the company has also remodeled its local interurban cars and its double-truck city cars.



The interiors have been equipped with leather-upholstered seats, heavy linoleum on the floor, sanitary handholds, nickel-plated fixtures and treadle door operation



These city cars have been painted with pennant end and stream-line effect

The local service between Fort Worth and Dallas is handled in normal times by four motor passenger cars. Originally the roofs of these cars were of the monitor type with deck ventilators. This type of roof leaks easily, particularly around the deck sash. All of the later cars have arch roofs with metal ventilators.

This same type of roof was installed on all cars. The floors were covered with linoleum of the same pattern used in the limited trains, namely, of 6-in. blue and white inlaid blocks with a clouded effect over the whole. The original side lighting was replaced by dome light fixtures in the center of the car.

Basket racks that were on the panels above the windows were replaced by nickel-plated coat and hat rack hooks. Bevel plate glass mirrors were placed on the window posts in the rear compartment and matchbox holders were placed on the window posts in the smoking compartment. The original seats were replaced by bucket type, air-cushioned double seats, upholstered in genuine blue Spanish leather. Nickel-plated wash stands, plate glass mirrors, paper towel dispensers and waste towel receivers were installed in the toilets. All metal car trimmings were nickel plated.

The floor of the rear vestibule was covered with green cork linoleum and a baggage rack was built in on the right-hand side. A cocoa foot mat was placed at the door. A special painting scheme was adopted, as mentioned below.

During the year twenty-five city converted one-man cars were also put through the shops and modernized. Each was equipped with treadle step control for the rear-exit door. This not only allows faster movement of passengers on crosstown lines, but is of particular advantage in Fort Worth because it can be used by negroes, who are required by law to occupy the rear seats of the cars.

To eliminate any possible danger of a passenger having his arm caught in the door after he has alighted from the step while still holding onto the post inside, the rubber tubing, used as a door edging, was replaced by two folded strips of sheet rubber, one screwed to the door and one to the post. The width of these strips is such that an obstruction like a human arm, up to a diameter of $2\frac{1}{2}$ in., may be pulled out from between the soft rubber edges without injury. One car was equipped with a device which will reverse the door engine and open the door if there is any obstruction to prevent full closing.

The floors of the city cars were recovered with green cork linoleum with aluminum edging around the trap doors and at the car doors. All interior metal fixtures were nickel plated and the original side lighting was replaced by square base dome light fixtures. The seats on four cars were replaced by divided spring-backed, deep-spring edge, cushioned Walkover seats, upholstered in genuine brown leather. Other seats were covered with imitation leather of the same color with an additional roll of cotton along the front edge of the cushion and a seam in the center of the back to give the effect of a bucket type seat. In their finish five city cars were painted on the outside with a combination color scheme having a pennant design on the end. The colors used on these cars varied somewhat, being, for the roof, gray and buff; for the letterboard, yellow and ivory; for the window rails, blue, red, gray and brown, and for the body panels, gray and maroon, brown and blue, brown and maroon, gray and brown. The sash in all the cars was painted ivory.

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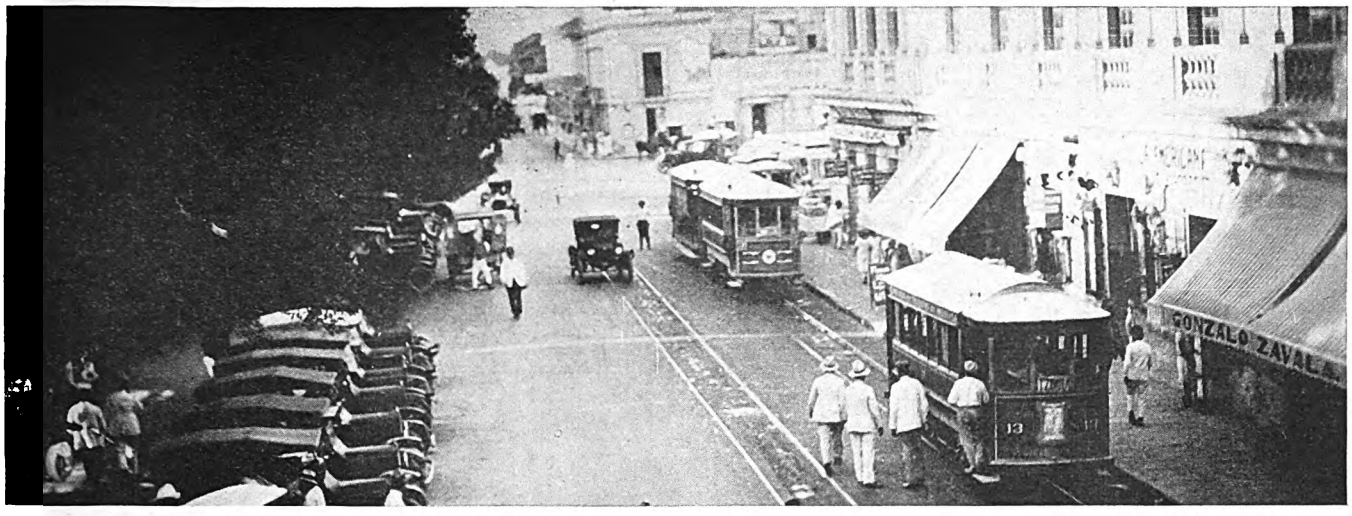


Ford motor-driven cars at the "Plaza Principal" in Merida

Mexican Street Cars Are Powered With Automobile Motors

By Terrell Croft

Consulting Engineer, Merida, Yucatan, Mexico

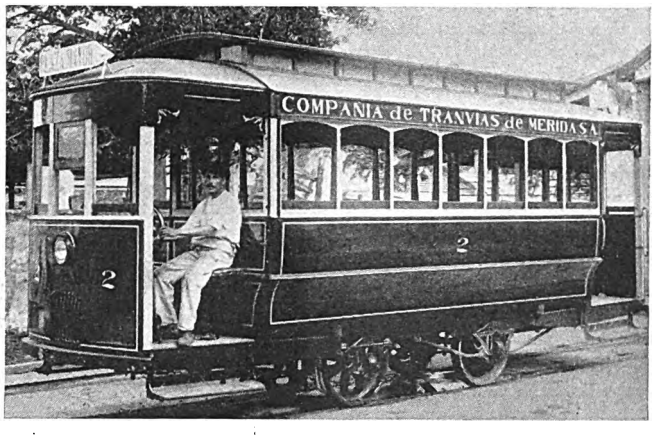
IN MERIDA, Yucatan, Mexico, the Compañia de Tranvias de Merida S.A. operates, on twelve different routes, an extensive street traction transportation system. Its cars, built by the company and in its own shops, are all driven by standard Ford automobile motors. Merida is practically level. Because of this, the standard Ford motor, with a nominal rating of 22½ hp., has sufficient power to propel the cars effectively. On lines having grades the power of this motor would be insufficient for successful operation. Cars of this same construction, which were built in Merida, are operated by the traction systems of the Mexican cities of Progreso, Campeche, Laguna, Toluca and Puebla.

Classified as to mechanical construction, the cars are of two distinct types: (a) One end with single control, (b) double end with double control. Both open and closed car bodies are used. Either type is adaptable for mounting on a single-control or a double-control chassis.

Standard Ford parts are used, wherever feasible, in adapting the Ford equipment. The motor is not altered. The auto frame is suspended from the wooden frame of the car by forged iron hangers. The motor is hung in the steel frame by the Ford hangers just as if it were in a touring car or truck. The rear axle housing of the Ford car is shortened equally on both sides. The two axles are also similarly shortened; new keyways are cut in their ends and new specially designed sprockets are keyed on, one on each axle. Then a link belt chain drive is arranged from each of these driving sprockets to driven sprockets which are keyed on the car wheel axle.

Differentials of three types are used, the Ford touring car differential, the Ford worm-drive truck differential and the "Eli" differential. For street car driving the third has proved by far the most satisfactory. The sprocket-wheel ratio employed with a differential of each of these types is shown in the accompanying table. Slack in the chains can be taken up by tightening the turnbuckles in the truss rods which hold the rear-wheel journal housings in position. These housings are free to slide horizontally under the car-frame timber which they support.

The control columns are mounted vertically at the end of the car. The gas and spark lever rods extend down through the column and through the floor of the car and are linked to the carburetor and Bosch magneto respectively. For convenience of handling, the positions of the spark and gas levers are reversed



One of the first single-end control cars built in the shops of the Compañia de Tranvias de Merida

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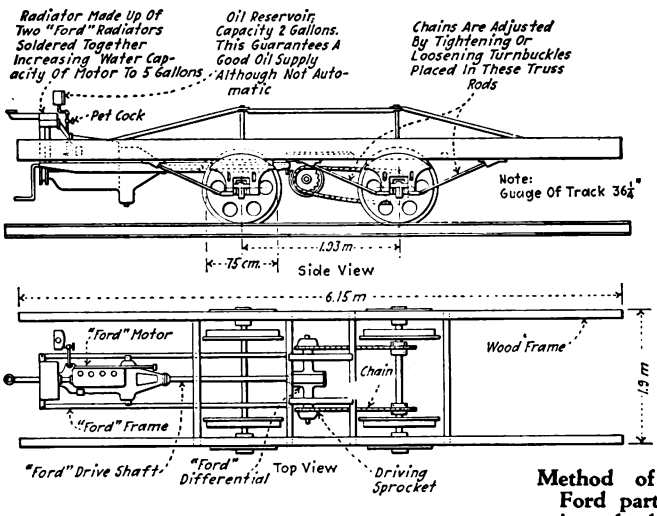
SPROCKET RATIOS USED WITH THE VARIOUS DIFFERENTIALS

Type of Differential	Number of Teeth in Small Sprocket	Number of Teeth in Large Sprocket
Touring	20	30
Worm-drive truck	28	30
Eli	15	30

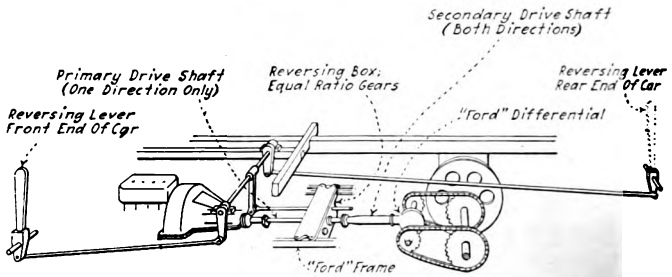
with respect to each other from the positions which they normally occupy in an automobile. On single-control cars there is but one control column and the standard Ford steering column is used for it. On double-control cars there are two control columns and the spark and gas levers are made removable so that the car can be controlled from but one end at a time. Iron pipes, instead of the Ford steering column, are used in double-control cars to permit this arrangement. On all cars the Ford magneto is used only for the headlight. A Bosch magneto is used for ignition.

It has been found that a single Ford radiator has insufficient capacity for cooling the circulating water. Hence for this service a single radiator unit is made of two standard Ford radiators soldered together back to back. This increases the water capacity of the cooling system on each car to 19 liters. The Ford gasoline tank is installed either horizontally under a car seat or vertically in the vestibule. The vertical setting has proved to be the best. The gasoline capacity of each tank is 38 liters.

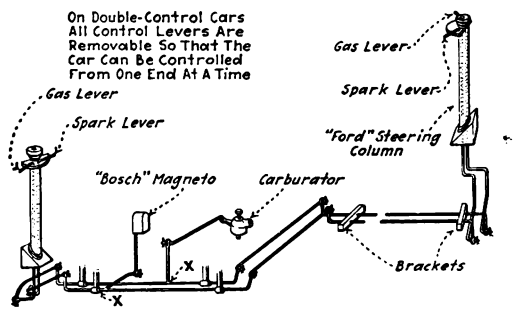
An 8-liter oil reservoir is mounted in the vestibule of each car. A pipe runs from this reservoir to the motor and a petcock is installed in the pipe. This oiling system is not automatic, but is effective in that it permits the carrying of an ample supply of lubricating oil on the car.



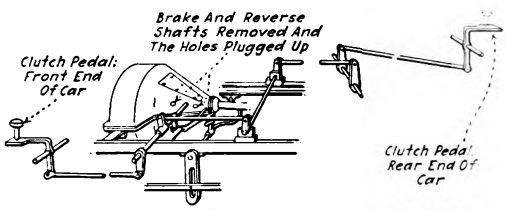
Method of coupling Ford parts to driving wheels



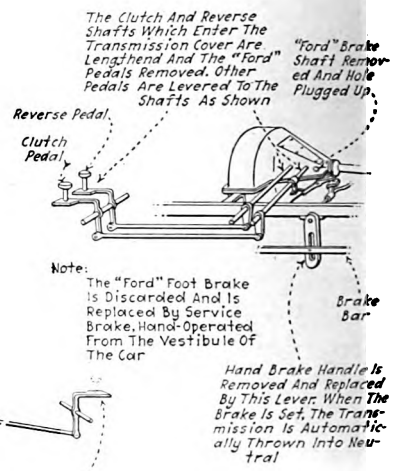
Method used for reversing double-control cars



Modification of ignition and gas controls for double-control cars. For single-control cars only levers to left of point X are used



Arrangement of levers for controlling clutch on double-control cars. Ford reverse has been discarded



Levers for controlling clutch and reverse on single-control cars

The Ford foot brake is replaced by a hand-operated brake, the hand wheel of which presses shoes against the wheels.

Manipulation of these cars is practically the same as that of a Ford automobile. On the single-control cars the clutch and reverse are operated by removable pedals in the floor of the vestibule. The stems of these pedals extend through the floor. The clutch and reverse shafts of the Ford motor, which enter the transmission cover, are lengthened and connected to the clutch and reverse pedals by lever arms and links. The Ford foot brake being discarded, the hole for it in the transmission cover is plugged. The Ford hand brake is removed from its shaft and replaced by a slotted wrought iron bar which hangs downward. A pin in the brake bar engages in the slot in the bar. When the motorman sets the brake, by turning the brake wheel in the vestibule, the transmission is thrown into neutral automatically.

On the double-control cars the clutch is operated by the same mechanism as that employed on the single-control cars. The Ford reversing mechanism is discarded and the hole which was provided for it in the transmission cover is plugged up. It is replaced by a reversing box mounted in the driveshaft, which contains a system of

OIL AND GASOLINE CONSUMPTIONS AND SPEEDS

Type of Differential	Maximum Speed in Kilometers Per Hour	Gasoline Consumption in Kilometers Per Liter	Oil Consumption in Kilometers Per Liter
Touring	40	4.00	36
Worm-drive truck	32	3.74	24
Eli	55	5.33	72

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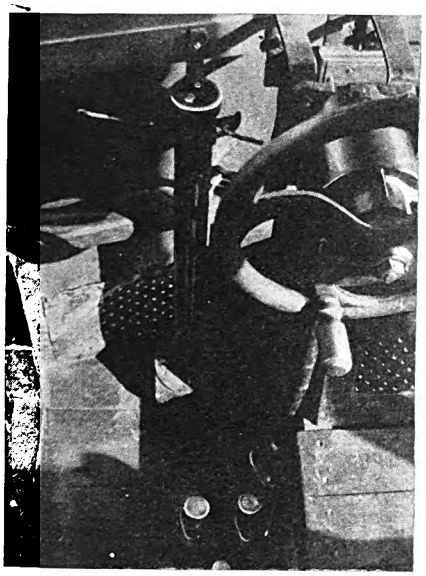
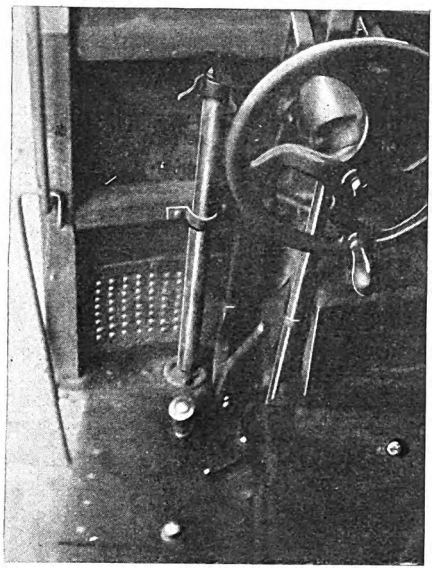
gears by which the rotational motion transmitted to the driving wheels is reversed. This reversing lever, which when in use extends up through the floor of the car, is removable to prevent its being tampered with by unauthorized persons.

Gasoline and oil consumption are very satisfactory considering the adverse conditions under which any cars in traction service must operate. Approximate figures are given in an accompanying table. The speeds which are tabulated are the approximate maximum speeds obtainable on straight, level tracks with normal load, that is with every car seat filled but without any standing passengers.

Without passengers, each car weighs approximately 3½ tons. Open-body cars seat 24 passengers, closed-body cars 20 passengers. Of 37 cars in operation 35 are single-control and two double-control. In the future only double-control cars will be built and operated because they have proved to be more efficient in operation than those which have only single control; they do not require a loop or "Y" in the track at the end of the line and have the advantage of being operable at high speed in reverse.



Control column and gear-shift pedals in one of the single-end control cars



Control column and gear-shift pedals in a double-end control car

The cost of a car complete is something between 4,500 and 5,000 Mexican pesos ($2,250 and $2,500). A car will operate approximately 8,500 km. between regular carhouse overhaulings.

All constructing and repairing are done in the shop of the company. There are no machine tools except a hand-operated drill press; all work is done by the blacksmiths, carpenters, trimmers, painters and motor mechanics. They turn out an admirable product. In view of their producing it with practically no mechanical equipment, they are deserving of commendation. Four blacksmiths, four painters, twelve machinists and twelve carpenters are employed. Of these 32 workers, fifteen are apprentices who serve without pay.

New Ford motors and parts are used in constructing the cars. Electric storage battery cars were tried in Merida, but their high operating cost rendered their adoption impracticable. The gage of the track is 92 cm. All of the methods and adaptations as described were developed under the direction of Tomas Salazar, V, master mechanic for the company.

Reduction of Fire Hazards in St. Louis Brings Reduced Premiums

SEVERAL interesting features of its practices are disclosed in the brief submitted by the United Railways of St. Louis for the 1927 Coffin Prize. One of these relates to a campaign it has been conducting to reduce the fire hazards on its property. An account of some of the more unusual steps taken follow:

In the oil storage room at both power plants an automatic steam smothering system was installed to extinguish oil fires. The equipment comprises a system of piping suspended from the ceiling of the oil room and connected to a high-pressure steam line with a control valve outside of the oil storage room. Grinnell Company jumbo sprinkler heads, specially adopted for use with high-pressure steam, were connected in the overhead lines at various points and serve to permit the escape of steam when a fire occurs. The resultant rise in temperature in the room is sufficient to fuse the link and unseat the valve in the sprinkler head. The smothering effect of steam in extinguishing oil fires when the oil is stored in a confined area is considered one of the most positive methods known and to be by far the most economical method where steam is easily available, as it is in power plants.

On the roof of one of the power houses an automatic aero central-station fire-alarm system was installed to indicate the presence of fire in the motor houses and beneath the wood decking surrounding the condensing equipment. This system utilizes the principle of expansion under heat of air contained in small tubing, which is installed along ceilings and walls in the power station and leads at each end to a diaphragm in a detector unit. The expansion of air in the tubing causes one or both diaphragms to close an electric circuit, thereby actuating a signal system through transmitter and relays.

The system is connected through a local alarm gong in the engine room and also in the office of the Missouri District Telegraph Company, and in the event of a fire both places receive a signal simultaneously. The central-station company dispatches the fire department upon receiving the signal. The system is exceedingly sensitive and indicates the occurrence of a fire in many cases in a fraction of a minute. It operates only on a rapid increase in temperature and is not affected by ordinary and gradual changes in temperature.

The coal storage building in this same power station is five stories in height and of the mill construction type. The coal from it is conveyed by way of an overhead bridge to the coal bunkers of the power house. The building is separated from the power house proper by a public street 60 ft. wide and three sides of it are exposed to fire hazards from adjoining property. To protect against these exposures a manually controlled water curtain was installed, divided into sections, and consisting of a system of piping arranged in lines and supported along the outside faces of the building. Open sprinkler

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heads are spaced at intervals along the piping. Each section is connected through a main to a central header with valve control at the header for each section. The water supply is from city mains at 80-lb. pressure, with steamer connections for fire department pumpers.

In addition to these methods of protection many others have been introduced in the power stations, shops and carhouses, with the result of a considerable saving in insurance premiums. In 1922 the railway company's property was covered by fire insurance in the amount of $11,754,100 and paid premiums totaling $66,223.44, whereas in 1926 the coverage was $12,684,800 and the premiums amounted to $44,603.84. In other words, although the coverage was increased almost 8 per cent, the premiums paid were reduced 32.5 per cent.

Track Rehabilitated in Place

THE way in which approximately 10,000 ft. of track in El Paso which had become in bad shape because of defective paving was rehabilitated forms an interesting part of the company's brief submitted in competition for the Coffin 1927 prize.

The rail in this track was in fair condition except at some of the joints, but it was found that a great many of the fastenings which held the rail to the steel ties had been completely destroyed by rust. In fact, for practically the entire length of the section the rails simply rested loosely on top of the ties. Rehabilitation of this track consisted of the removal of the old bitulithic paving, welding of the rail base to every tie, welding and grinding of all joints and resurfacing the track area.

The most difficult problem was probably to repair the defective joints. At each joint the concrete was broken out over an area 30 in. square and the dirt was removed to a depth of at least 18 in. below the base of the rail. An 8-in. x 10-in. x 24-in. white oak block was then inserted under the joint and secured by four screw spikes. Ten inches of dry rich concrete was then tamped under the block with pneumatic tampers until no motion could be detected in the block or rail while cars were passing.

The old rail angle-plates, after a thorough cleaning and rebolting whenever necessary, were then welded and the battered rail ends built up and ground. The sides of the rails were gone over thoroughly with a scaling tool especially designed by the company.

The total combined cost for excavation, track repairs and paving replacements was only about $2.65 per foot of track. Arc welding machines, compressed air tools

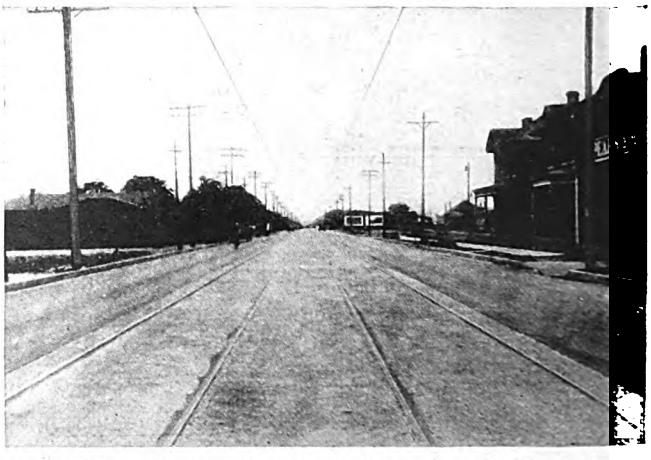
Signs like this help the public in El Paso to realize the cost of track reconstruction

and other labor-saving machinery enabled the company to cut the cost of this job practically in half as compared with hand work. Moreover, complete reconstruction of the track would have been necessary had the work not been done promptly. The cost of such reconstruction, including new rails and concrete base, would probably have been about $11 per foot. The work was carried on without any interruption of street car service and practically without disturbance to vehicular traffic.

The result of this undertaking has been to save the major portion of the original investment in the track and to prolong its life by at least fifteen years.

Monthly Labor Review Quotes From Journal's Article

IN CONNECTION with a discussion of industrial relations and labor conditions, the October issue of the *Monthly Labor Review* of the Bureau of Labor Statistics, United States Department of Labor, contains an extended abstract of the article entitled "Labor Conditions on European Local Transportation Systems," by Henry W. Blake, which appeared in the Aug. 27 issue of this JOURNAL, page 351. The portions of this article featured in the Labor Bureau's publication are those relating to methods of examining applicants for employment on European street railway and bus systems, and on the systems of providing housing for street railway employees followed on several European properties.



The rail shown in the view at the left was in good condition, but had parted from its ties when the steel fastenings had rusted away. The completed track, which was rehabilitated without disturbing car traffic, is shown in the right-hand view

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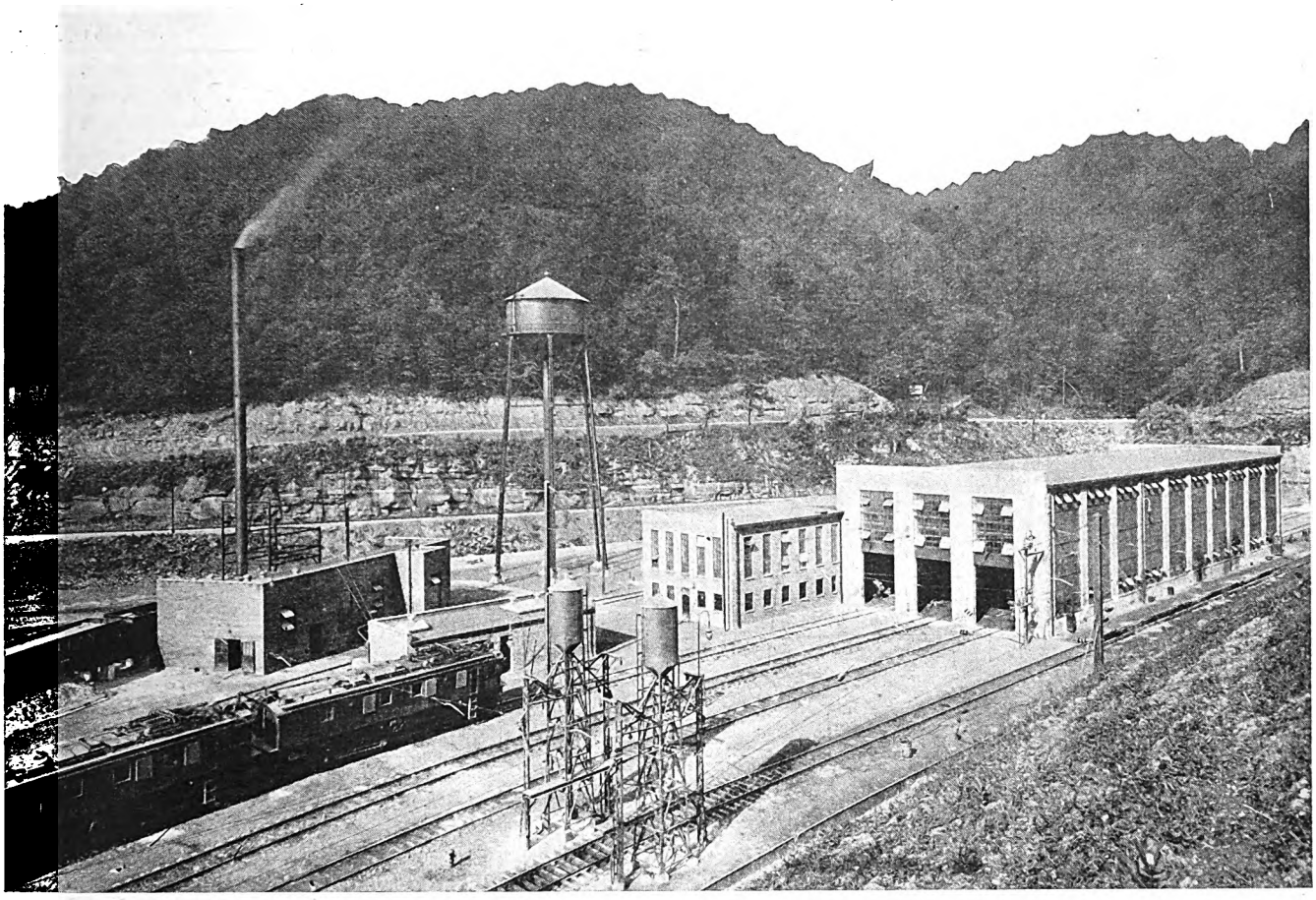

General view of Virginian locomotive maintenance shops. The sanders may be seen in the foreground

Locomotive Maintenance Shop
of the Virginian Railway

A modern repair shop has been recently put into operation at Mullens, W. Va., to care for 36 locomotives on the electrified division

By Allen McLanahan
Service Engineer Westinghouse Electric & Manufacturing Company

IN CONNECTION with the electrification of 134 route-miles of track from Mullens, W. Va., to Roanoke, Va., complete service on which was inaugurated in 1926, the Virginian Railway has erected a new modern shop for the maintenance and repair of electric locomotives. This is one of the few instances that a complete new plant, designed for the purpose, has been constructed in connection with an electrification. This electrification, contract for which was awarded to the Westinghouse company in 1923, included 36 motive power units of 215 tons each. Normally three units comprise a locomotive, so that shop facilities had to be provided to care for locomotives measuring more than 150 ft. in length.

In considering the proper location for the electric shop it was desired that it should be not only the repair point, but as far as possible should be the turning point for all locomotives. Since certain locomotives operate only at the western end of the electrification, on Clark's Gap hill, the shop was located at Mullens, which is the western end of the electrified zone. All engines now operate out of Mullens and the necessity of maintaining a stock of spare parts at several points is eliminated. The only additional shop facilities required are those for making the inspection and running repairs to locomotives at Roanoke after their eastbound trip.

The plant includes the shop building, a storehouse, an oil house, a building for the substation and steam heating boiler, a water tank, sanding towers, an outside inspection pit and locomotive storage tracks. As all the tracks outside the shop are electrified, there is no need for a steam locomotive to move the electric units.

On arrival from the road a locomotive passes between the sand towers, where the sand boxes and rheostat

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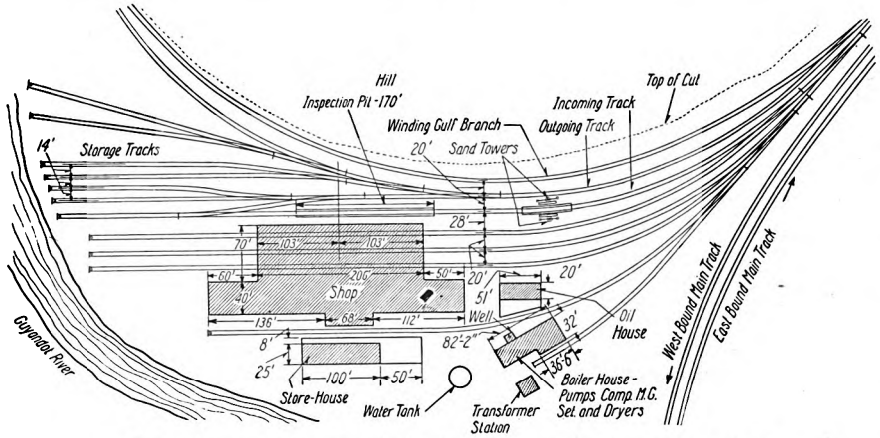


Plan of general layout of Virginian locomotive inspection shops

fresh water tanks are filled and the running gear washed. The locomotive is then moved along the same track to the inspection pit, where it receives a complete mechanical and electrical inspection. The trolley wire over this pit is equipped with a disconnecting and grounding switch so that the inspection of the pantographs and roofs can be made in safety. After inspection the locomotive is put on one of the storage tracks until it is again called. If repairs are to be made, however, it is pushed into the shop by another electric locomotive.

The water for shop purposes and for use in the liquid rheostats is obtained from a well located under the sub-station building. A deep well pump supplies this water to the 125,000-gal. storage tank, from which it is piped to the shop and yard. For fire protection a motor-driven fire pump supplies water at high pressure to a pipe line to which fire hydrants are connected at convenient points in the shop yard.

The Shop Has Two Main Bays

The main shop building has two bays and a wing which contains the carpenter shop, bake ovens and dip tank. The first bay or inspection building is 206 ft. long and 70 ft. wide and contains three pit tracks, each long enough for a complete locomotive. Each pit has a jacking shelf and is equipped with permanent lights, receptacles for portable lamps and piping for compressed air. There is a drop pit with a portable hydraulic jack near each end of these tracks so that six points have been provided for dropping wheels and engine trucks. This bay is served by a 30-ton electric crane. A gallery has been provided along the outside track at the height of a locomotive roof for use in connection with pantograph or other roof work.

The second bay contains the tool room, air-brake room, machine and blacksmith shops, winding room, electrical repair spaces, locker and wash-rooms and the offices. This bay is served by a 15-ton electric crane, operated from the floor.

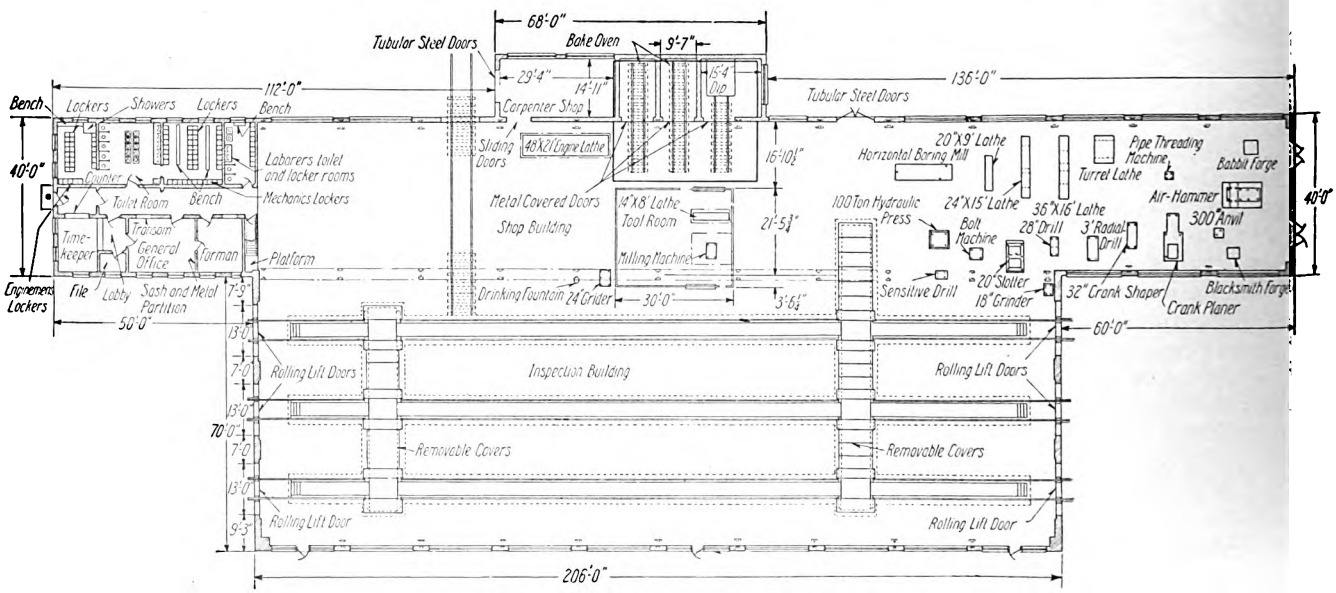
The floor of the whole shop consists of 2-in. treated oak planks laid on sills set in crusher dust. The shop is heated by an indirect unit system, each unit consisting of a steam radiator, electric blower fan and air piping. The ceiling is painted white, and plenty of lamps give excellent illumination at night in all parts of the shop.

The whole shop is piped for compressed air and outlets are located at convenient points for connecting portable lamps, the insulation testing outfit and a portable arc welding set. There is a 32-volt alternating-current circuit, by means of which current can be supplied to the locomotive lamps without using the batteries or energizing the locomotive. This arrangement is of great assistance.

The machine shop contains the following machine tools, each of which has individual motor drive:

84 in. engine lathe	48 in. vertical turret lathe
30 in. engine lathe	32 in. shaper
24 in. engine lathe	20 in. slotter, 26-in. stroke
18 in. engine lathe	36 in. radial drill press
60 in. universal (horizontal) boring mill	28 in. vertical drill press
32 in. crank planer with 40-in. stroke	18 in. vertical drill press
	4 in. pipe cutting machine Bolt machine

In addition there are two electric grinders, a 100-ton air-operated bushing press and hand-operated sheet metal shears, roller and crimper. No tire-turning equipment or wheel press has been installed as it is intended that this work shall be done in the Princeton shops.



Plan of layout of inspection building

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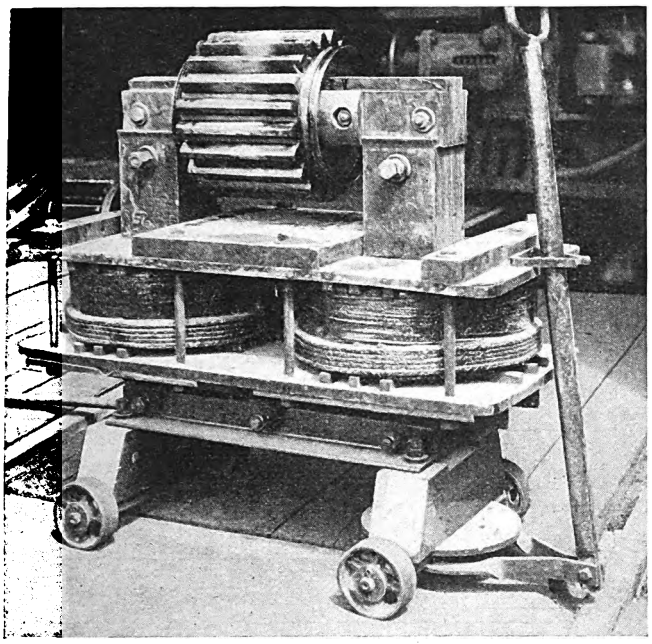
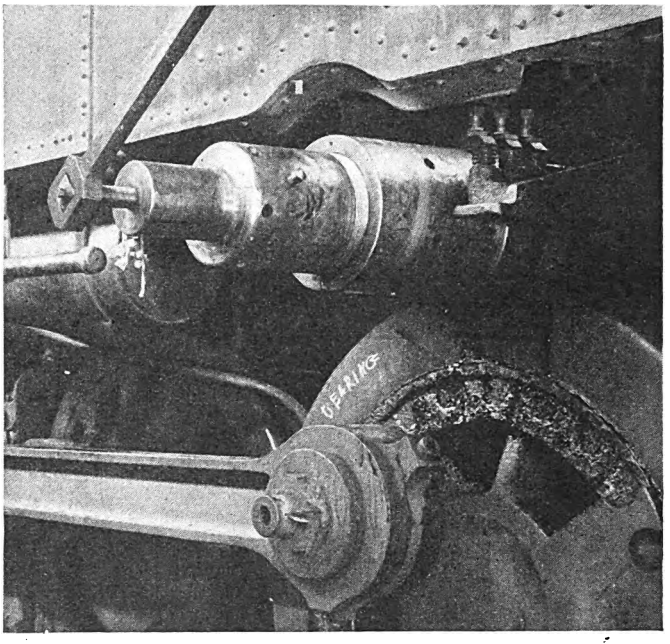


The portable electric pinion heater does the work quickly and accurately



The hydraulic pinion puller makes pinion removal an easy task

The 84-in. lathe is used for banding the large traction motor and phase-converter rotors and can be used for turning the journals of the driving wheels if necessary.

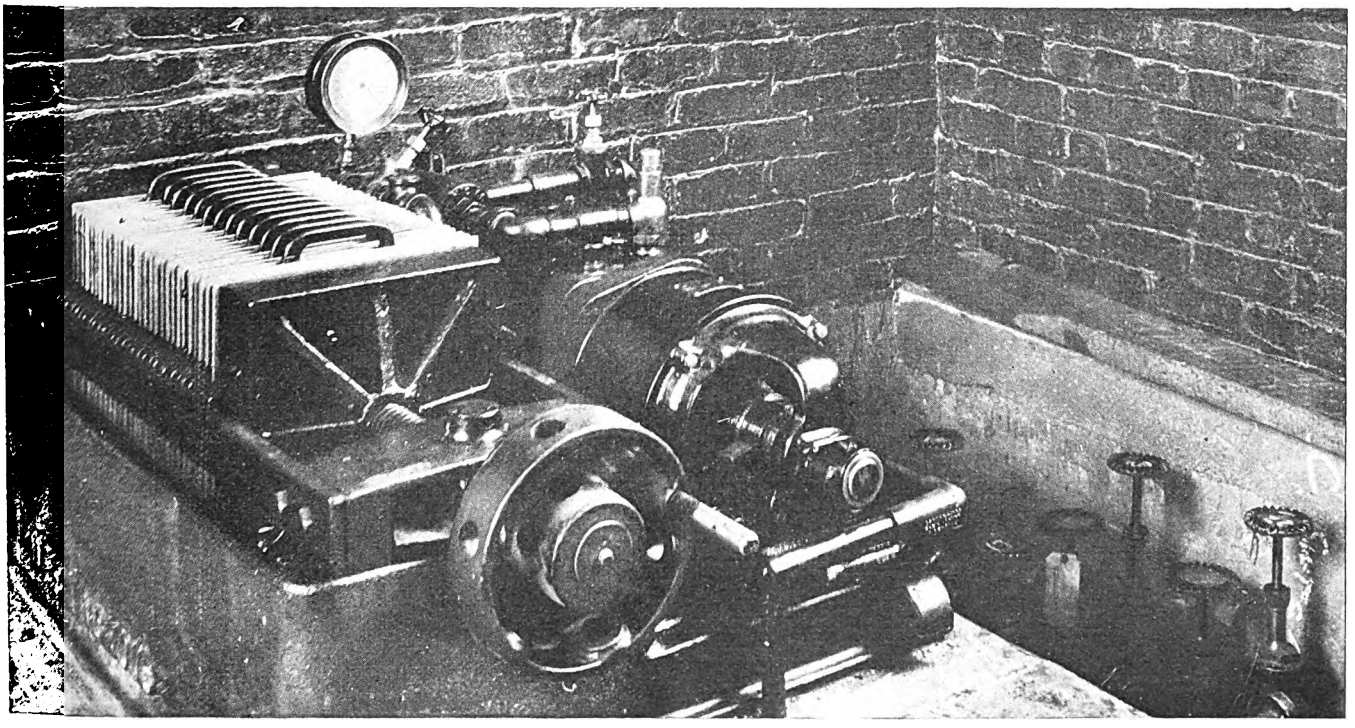
The tool room, located in the center of the shop, has the necessary shelves for tools and special equipment and contains a 14-in. engine lathe and a universal milling machine. The carpenter shop has a combination woodworking machine, which consists of band saw, planer, rip saw and wood lathe.

In the blacksmith shop are two forges, of which one is used for babbitting work. These are supplied with air from a motor-driven blower. For heavy work there is a 600-lb. air-operated hammer, the air being supplied by a motor-driven compressor which is integral with the hammer. An electric pyrometer for the babbitting furnace insures that the metal is poured at the proper temperature.

A separate room inclosed by a wire screen is used for the repair and testing of the air equipment. This room is fitted with benches, a test rack designed for testing the air-brake equipment used on the locomotives and a rack for testing magnet valves.

Offices for the timekeeper and crew dispatcher, the general foreman and the electrical foreman are on the ground floor. The washroom and toilet facilities are located across the hall from the offices, and there are three locker rooms for enginemen, white shopmen and colored shopmen. A shower bath is installed in the enginemen's locker room.

A gallery above the offices and locker rooms is used



Oil filter press and valves located in oil house

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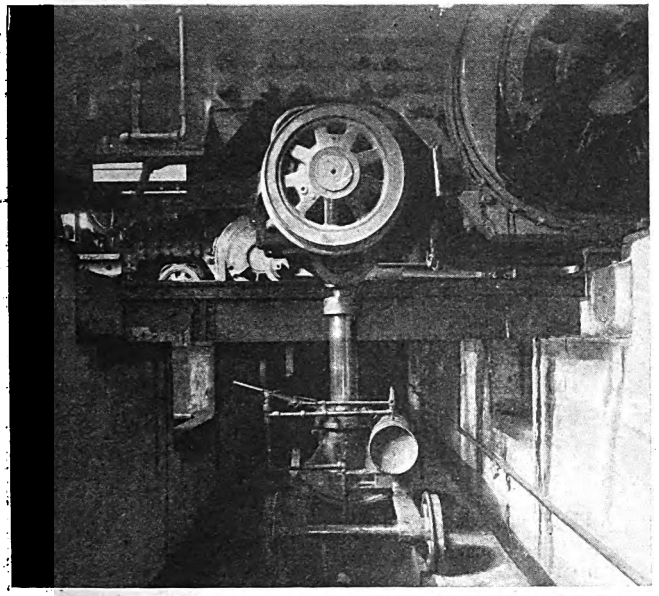
the 11,000-volt trolley wires, is stepped down by two transformers, one for each machine, located in an outdoor substation. The sets are started by single-phase series motors, mounted on the common shaft, the transformers being arranged to give the reduced voltages required. Disconnecting switches make it possible to supply the transformers from either eastbound or westbound trolley.

The switchboard contains two a.c. motors, two d.c. generators and three d.c. feeder panels. The d.c. feeder lines run to distribution panels in the shop, where the fuses and switches for the various motors and lighting circuits are located.

The substation room also contains a single-stage, 12 x 10



There are six drop pits equipped with portable hydraulic jacks

air compressor that supplies the shop. In emergency, if the shop compressor fails, locomotive compressors may be connected to the shop air system.

Arrangements have been made for the purification of the oil used in the locomotive transformers by a Westinghouse oil-treating outfit, located in the substation room, two oil tanks buried in the ground and pipe lines to the shop. There are two of these lines, one for the clean and one for the dirty oil, each with three outlets on each side of the shop, properly spaced to take care of a three-unit locomotive. By means of a manifold and valves the dirty oil can be run down into one of the tanks and fresh oil pumped into the transformer, or the oil can be taken out through the filter into a tank and then passed through the filter back to the transformer. By this system the oil of all the transformers of a three-unit locomotive can be completely purified in one day. This piping is so arranged that the oil in the substation transformers can be passed through the same filter. Two additional tanks purify the oil used in the circuit breakers without mixing it with the transformer oil.

One end of the substation building is used for sand storage, a coal stove being used for drying. The dry sand is put into one of two drums, each connected to one of the two sanding towers, and raised to the towers by admitting air to the top of the drum. Each tower has three outlet pipes, spaced to accord with the openings of the locomotive sand boxes, so that a unit can be completely sanded without movement. As the sand box openings are on the outside of the cabs, no sand enters the equipment compartment.

Among the new features in this shop are the two portable electric pinion heaters of the induction type. The pinion becomes the secondary of a transformer and is heated by the current that passes through the primary. The locomotive pinions are heated more rapidly and uniformly than is possible in an oven, about 35 minutes being required to raise the temperature to 135 deg. C., at which temperature the pinions are placed on the traction motor shafts. While these heaters were primarily designed for pinions, they are used for heating bushings and other rings that are to be shrunk on.

The policy of using special tools and mandrels wherever desirable has been followed from the beginning. A large supply of these was obtained with the locomotives, and additional tools have been made as soon as they were seen to be of advantage.

Hazards from Spray Painting

IN AN article on hazards from spray painting in the monthly *Labor Review* for September, 1927, mention is made of the study being conducted on this subject by the Pennsylvania Department of Labor and Industry. Without ventilation and with lead paint, there was found to be a very decided lead hazard and also a hazard from the solvents and driers used in the paint. Where the spray painting is conducted in properly constructed cabinets and the ventilating equipment is placed so that the spray is not drawn past the operator's face, the process is considered safe, provided all the precautions used in other kinds of painting, such as strict personal cleanliness, protecting foods and street clothing from dust and spray, etc., are followed. Masks are considered impracticable.

With the quick-drying leadless paints, such as lithopone paint and those with a pyroxlin base, the hazard comes from benzol. With these also there should be good ventilation, with scrupulous cleanliness of workrooms and booths at all times. To prevent unnecessary liberation of solvent vapors as well as to decrease the fire risk, the materials containing volatile solvents should be kept covered or closed.

Still another hazard to be guarded against with the spray is the use of too great air pressure or pressure beyond that for which the tank is guaranteed. The report points out that there is fundamentally no excuse for this increased pressure, but that workmen whose air brushes become clogged may think this the easiest way to get good action. Two accidents from too great an increase in pressure are mentioned in the *Labor Review*.

St. Louis Builds Nine Concrete Loading Platforms

DURING the past year nine concrete passenger-loading platforms were installed at various locations along the car lines of the United Railways Company of St. Louis. These platforms were built jointly by the St. Louis School Board, the Police Department and the railway company. According to its Coffin contest brief, these platforms are 100 ft. long and 4 ft. 7 in. wide. A signal light on a concrete base is placed at the forward end of each platform and a concrete pedestal at the rear end of the platforms. The platforms have been found to contribute much to the safe landing of passengers where automobile traffic has been heavy.

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Harvey L. Bullock

Wins Monthly Maintenance Prize for October

SPECIAL equipment for testing and regulating thermostats as used by the New York Central Railroad receives the $25 Monthly Prize for October in the ELECTRIC RAILWAY JOURNAL'S Maintenance Competition. Honorable mention was given to a machine for oiling track curves submitted by I. O. Mall of the New Orleans Public Service, Inc.

Harvey L. Bullock

IT IS extremely important that thermostats function properly in order to insure proper regulation of heat on cars. In general, too little thought has been given by electric railways toward maintaining thermostats in proper working condition. The most general practice is to install them on cars and then forget about them, assuming that if anything happens so that they do not operate properly, they will be reported by the transportation department.

A very ingenious device for testing and regulating thermostats as used by the New York Central Railroad at its White Plains, North Station, and as described by Harvey L. Bullock, general foreman of electrical equipment at those shops, provides an accurate means for testing and regulating the thermostats. The device is of very ingenious construction and shows much thought has been given to the problem of thermostat adjustment. It was described in the Oct. 20, 1927, issue of ELECTRIC RAILWAY JOURNAL.

A machine for oiling track curves, the description of which was submitted by I. O. Mall, assistant superintendent of roadway for the New Orleans Public Service, Inc., evidently has materially reduced the hazards to the curve greaser from vehicular traffic, as it enables him to give practically his entire attention to traffic conditions without detracting from the efficiency of the oiling operations. This device was awarded honorable mention by the judges for items published in the October maintenance issue. The saving in labor cost from the use of this device should commend its use to other properties.

MONTHLY MAINTENANCE CONTEST CONTINUES

Items continue to come in for the Maintenance Competition, and the ideas submitted are of a very high character. It is evident that the articles published so far are just combing the surface, for in the items submitted there is no duplication and it appears that there is a very broad field for the improvement of maintenance practices and equipment. Twelve articles were published in the Maintenance Data Sheet section of ELECTRIC RAILWAY JOURNAL for Oct. 20, 1927. Additional items appear in the following pages. One of these will be awarded the $25 monthly prize for November. Results of the contest each month are awaited eagerly by a large number of readers.

Following are the conditions of the contest:

1. Any employee of an electric railway or bus subsidiary may compete.
2. The author does not need to be the originator of the idea.
3. Articles may be submitted by several persons or by a department.
4. Any maintenance practice or device for electric railway or bus repairs may be the subject.
5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.
6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."
7. Manuscripts should be mailed to the editor of ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, New York.
8. A prize of $25 will be awarded each month for the best maintenance idea in the group published. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until April 30, 1928.
9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the one containing the item.
10. Additional details were given in ELECTRIC RAILWAY JOURNAL for April 16, pages 700-701.

THE winner of the monthly prize for October in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest is general foreman of electric equipment in the shops of the New York Central Railroad at White Plains, North Station. He has served in this capacity since 1908, and during this period has initiated many improvements in mechanical and electrical devices pertaining to multiple-unit cars and locomotives. He has also made improvements in maintenance and shop practices. Mr. Bullock began his electric railway experience as electrician for the Schenectady Railway and later was promoted to carhouse foreman. He also worked for the General Electric Company at Schenectady in the construction department on electric locomotives. At that time the bipolar type ordered by the New York Central Railroad was being equipped and upon the electrification of the Grand Central Terminal, Mr. Bullock was transferred to that point in 1906 as foreman in charge of multiple-unit cars and electric locomotives for the Harlem Division. Mr. Bullock was born in Cohoes, N. Y., 45 years ago.

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Electric Railway Journal Maintenance Data Sheet

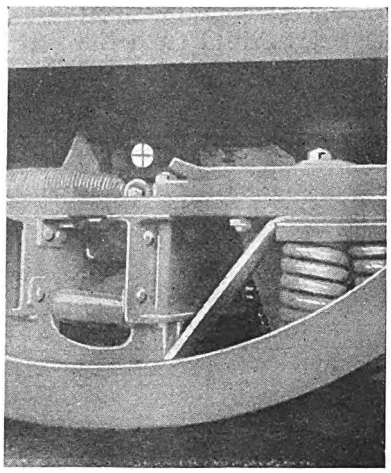
ROLLING STOCK—TRUCKS—16

Grease Cups Lubricate Side Bearings*

By H. A. Albin
Superintendent Lancaster, Ephrata & Lebanon Street Railway, Lebanon, Pa.

PROPER lubrication of truck side bearings has proved somewhat tedious and thus is often neglected or put off. The most common practice is to jack up one corner of the car and apply the lubricant with a grease gun or swab. This, at best, is a slow method and ofttimes more grease is placed outside of the bearing than on the surfaces where it is needed.

Where a railway has many curves, side bearings should be greased periodically so that the trucks will swivel easily and save wear of both wheel flanges and the rail. On the Lancaster, Ephrata & Lebanon Street Railway a simple plan has been devised. A hole is drilled in the lower side bearing plate and tapped for a ¼-in. pipe. A short nipple is inserted with an elbow pointing toward the outside of the car. Another nipple 2 in. or 3 in. long with a good-sized grease cup is screwed to the elbow.



The head of the grease cup is marked "X" in the above illustration

The grease cup can be reached easily from the side of the car and can be filled with regular side bearing lubricant. It can be given a turn easily and quickly at periodical intervals and the grease is thus forced directly where it is needed without wasting any of it.

This method saves time, trouble and grease and does away with the necessity for jacking up the car body. It has proved very inexpensive and effective. With a little practice the amount of turning of the grease cup to furnish proper lubrication can be gaged easily.

*Submitted in Electric Railway Journal Prize Contest.

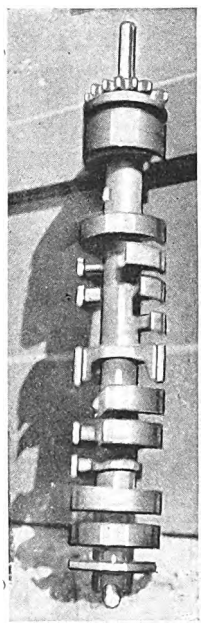
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—29

Tightening Controller Cylinder Castings*

By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

CONSIDERABLE trouble has been experienced on our property from loose controller cylinder castings with K6 and K28 controllers, which have round shafts. To overcome the trouble without going to the expense of buying new cylinders with hexagonal shafts, a $\frac{13}{64}$-in. hole was drilled through the casting, insulation and shaft. A $\frac{5}{16}$-in. diameter round hard fiber pin was then driven into the hole. Three of these pins were put in the upper cylinder casting, two in the center casting and two in the lower casting. This method of tightening the castings and insulation has proved entirely satisfactory and has been done at a very low cost. In carrying out the work care must be taken to drill accurately through the center of the shaft and the hole must be cleaned out carefully of drillings and other metal particles to remove any chance of later having a grounded cylinder.



K6 controller cylinder with tightened casting

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—17

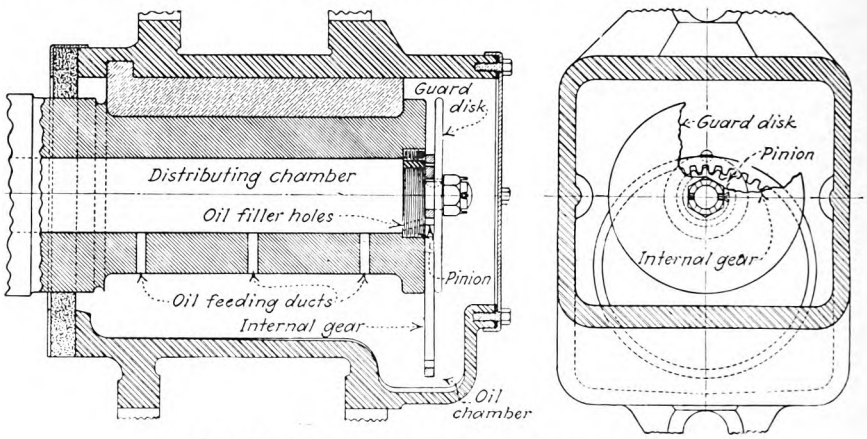
Splash Lubrication for Journal Bearings*

By H. S. Williams
Assistant Superintendent of Equipment,
Department of Street Railways, Detroit, Mich.

In an effort to improve journal bearing lubrication, the system shown in the accompanying drawing has been developed. This provides for flood lubrication of the bearing surfaces and its efficiency in service is proved by the fact that heat tests show a bearing temperature rise of 19 deg. F. with the new method as compared with the 33 deg. F. rise with the standard oil and waste lubrication system. In addition, the journal box construction makes it dust-tight.

The outer end of the journal is supplied with a small spur pinion over which runs an internal gear of large enough diameter to reach nearly to the bottom of the journal box. This internal gear is held in place by a guard disk that is held outside the pinion. The interior of the journal is hollowed out to provide an oil distributing chamber. This reservoir is supplied with oil through filler holes drilled from the root of the pinion teeth into the distributing chamber. Oil is fed to the underside of the bearings through holes drilled radially into the distributing chamber.

The operation consists of picking up oil from the journal box by the internal gear, which carries it to and forces it through the filler holes into the distributing chamber, from which it is fed by centrifugal force to the bearing surface. An oil-throwing ring is provided on the journal to prevent oil being carried out through the dust guard.



Flood lubrication system for journal bearing

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—30

Better Support for Armature Leads Decreases Breakage*

By M. S. Walker
Armature Winder Beaver Valley Traction Company,
New Brunswick, Pa.

Considerable difficulty from breaking of armature leads back of the commutator on high-speed interpole motors has been experienced by the Beaver Valley Traction Company, New Brunswick, Pa. By disconnecting the armature leads carefully it was found that there was a slight breathing movement of the coils at the front end of the diamond. This was found to be due to the drying out of the coil.

When in service the continual movement of the armature coils had a tendency to move them upward against the top leads, and in time these would break off back of the commutator neck.

To overcome this condition three layers of friction tape and two layers of oil linen tape, together with one layer of 0.012 in. fish paper, were placed over the diamond and the entire assembly was then wound with a 1⅛-in. steel band of No. 17 wire. This was soldered securely. Four layers of friction tape and three layers of oil linen tape were then placed over the bands and connected to the top leads. This method has been used for the past two years and has proved very effective.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—14

Electrical Connections for Supplying Power to Run Out Trucks and Return Them to Cars*

BY CHARLIE HERMS
General Foreman San Diego Electric Railway, San Diego, Cal.

THE attached diagram shows a simple and convenient method for supplying power to the motors on trucks of electric cars to run them out from under the car bodies and return them after overhauling. This has been found a great time and labor saver in the shops of the San Diego Electric Railway over the old method used of pushing the trucks by hand. Previously four men were required, while with the electrical method the regular overhauling crew of two men handle the job with ease and lose little time.

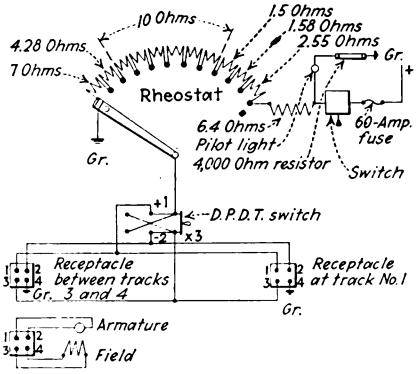


Diagram Showing Jumper Connecting Motor to Receptacle

By means of plug connections the car motors are used to run the trucks out and return them under their own power

Our shop has plug-in receptacles mounted conveniently alongside the overhauling tracks. Motor leads are equipped with standard knuckle-joint connectors and these are marked to correspond with the field and armature leads, and so eliminate wrong connections. The male end of the four-conductor plugs is also provided with a guide so that it cannot be wrongly inserted. In removing a truck one man operates the rheostat while the other spots the truck in its location.

A double-pole, double-throw knife switch is mounted at the rheostat for reversing the motor current. A red pilot light is also mounted in plain view so as to warn the shop men when the switch is closed.

In the diagram of connections it will be seen that a shunt method of control is used. This was found of advantage in that very fine regulation is provided which does not require as much resistance as would be necessary with a series method. Also with the shunt method a part of the resistance is connected permanently between the line and the rheostat to safeguard against flashover.

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—12

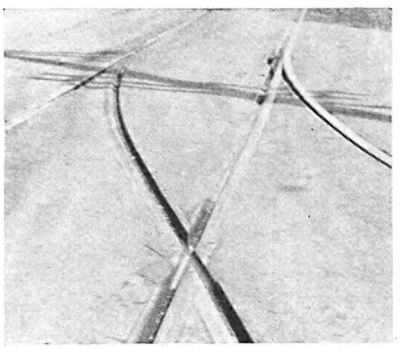
Special Work Frogs for Quick Repairs*

BY LOUIS T. BOTTO
Superintendent Maintenance of Way San Antonio Public Service Company
San Antonio, Tex.

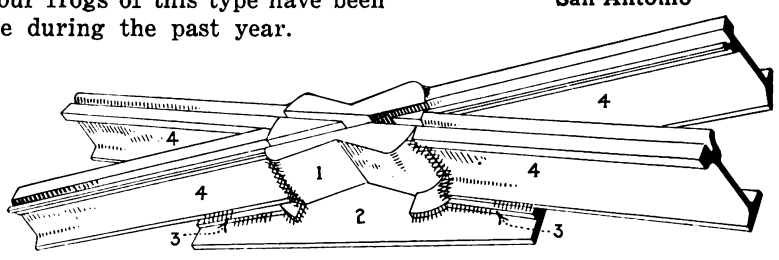
USUALLY it takes from six to eight weeks to get a special work frog made at a factory in the North or East and delivered to our railway in San Antonio. When a frog breaks in service it should be replaced immediately, and to meet such conditions a cast-steel casting has been developed which is used in conjunction with steel plates and regular 105-lb. and 110-lb. rails in fabricating special work frogs.

The casting is designed so that any angle frog, either straight or curved, can be made up in two or three days by a welder and two helpers. Electric welding is used for fastening the bottom of the casting to the first plate and for welding the two plates to each other. Acetylene welding is used in fastening the rails to the castings and plates. After the welding operations are completed the flangeways through the castings are marked out with an acetylene torch and are then ground out true to line with an Atlas rail grinder and set.

Four frogs of this type have been made during the past year.



Frogs installed on Goliad Street, San Antonio



1, Frog casting
2, ½"x2'x4' Plate
3, ⅜" Plate to go under base of rails
4, 105 lb. or 110 lb. Groove rail any required length or curve

////// Electric spot welds

Rails 4 welded to casting 1 with acetylene welding torch

Construction used for making frogs

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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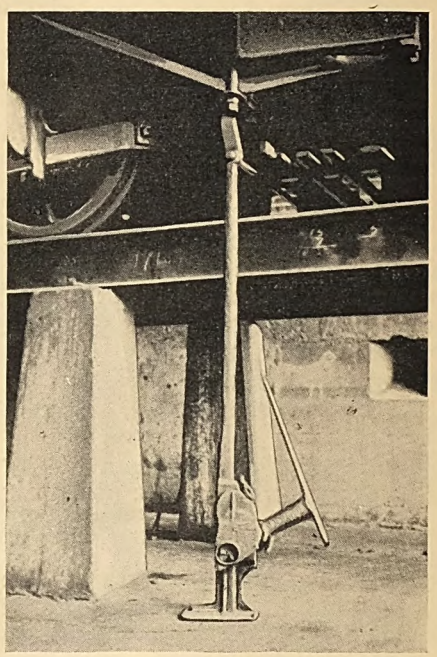
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—15

Jack Extension Eliminates Blocking*

By Edwin C. Kelly
Shop Foreman Virginia Public Service Company, Hampton, Va.

AN EXTENSION of suitable length welded to the stem of an ordinary ratchet jack has proved a very handy device in the shops of the Virginia Public Service Company, Hampton, Va. This is used in pits where minor repairs and inspections are made. When changing axle bearings, motor supension springs and on similar jobs where the use of a jack is necessary it may be placed in position quickly without blocking and the required height obtained without occupying unnecessary space. When placed in position it does not interfere with the movements of the workman.



Jack with extension arm in pit of the Virginia Public Service Company

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—13

High Carbon Steel Used for Repairing Track Tools*

By F. C. Womack
Engineer Maintenance of Way, Virginia Electric & Power Company, Richmond, Va.

CONSIDERABLE saving results in the repair of maintenance of way tools used by the Virginia Electric & Power Company by electric welding high-carbon steel to the points that are subjected to abrasive wear. The accompanying illustration shows a pneumatic tie-tamping tool before and after repairs are made. The view on the left shows the tool after about a week's use. The center illustration shows the tool after it has been built up with high-carbon steel and the view at the right is of the tool after it has been dressed up on an emery wheel. By this method tools retain their shape from four to five times as long as they do when repaired by the blacksmith.

At left, the tool before repairs. In center, built up with carbon steel. At right, after finishing on emery wheel

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—4

Removal of Ears in Special Work*

By W. T. Trautman
Superintendent of Emergency Division,
United Railways & Electric Company,
Baltimore, Md.

TWO of the greatest difficulties in the maintenance of overhead special work structures are the renewal of ears and the prevention of trolley wire breaks. The trolley wire and ears in special work are punished particularly at ear supports due to the hard spot. In addition considerable maintenance work is required to keep the straight line trolley wire in good alignment due to the hangers creeping on the curve pull-off wires.

On lines of the United Railways & Electric Company, these conditions have been mitigated by eliminating approximately 2,300 ears from the straight line trolley wire in special work locations at the points of intersection with the curve pull-off wires. The pull-offs are elevated on the poles to clear the straight line trolley wire by at least 12 in. The removal of these ears has aided in keeping the special work in good alignment and in eliminating the severe localized burning and cupping which formerly occurred at each ear.

As it has been necessary to renew the ears on an average of at least twice each year, their removal has effected an annual saving in the maintenance budget of approximately $4,300.

Special work after the removal of ears and the elevation of the pull-offs

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

SIGNALS—3

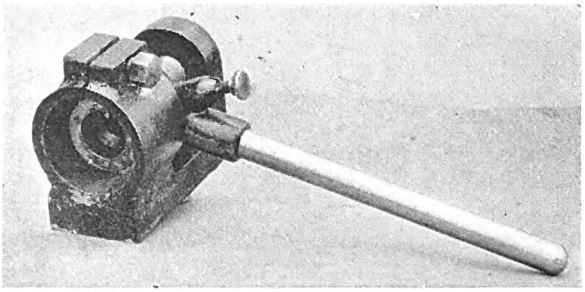
Device for Removing Piston Rod Retaining Rings*

By A. D. Moore
Electrical Department, 69th Street Terminal,
Philadelphia Rapid Transit Company,
Philadelphia, Pa.

CONSTANT use of the threads of piston-rod retaining rings for electro-pneumatic signal apparatus of the Philadelphia Rapid Transit Company, subway - elevated lines, causes them to become jammed, making it impossible to remove them with a hand spanner wrench. To overcome this difficulty a combination clamp and ratchet spanner wrench has been designed and built by the shop forces. The piston clamp is a split cylinder welded to a base. Lugs for the clamping screw are also welded to the cylinder. A Toledo No. 00 pipe-threading device was adapted for a spanner and ratchet handle. Dies were removed from a ½-in. stock and two pins inserted in the face to engage with holes in the retaining ring. In order to provide positive engagement between the pins and ring an extension was welded on the back of the stock, which threads into a tailpiece. As the pitch of these threads is the same as that of the rings the spanner and ring back off together.

The hole through the die stock was continued through the extension to allow the piston rod to extend through. A ratchet handle is used with the die stock in the usual manner. As no changes are made in the handle it may be used for pipe threading when necessary.

This device is used also for tightening rings when they are replaced as well as for removal.



Piston-rod retaining rings are removed easily with this device

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

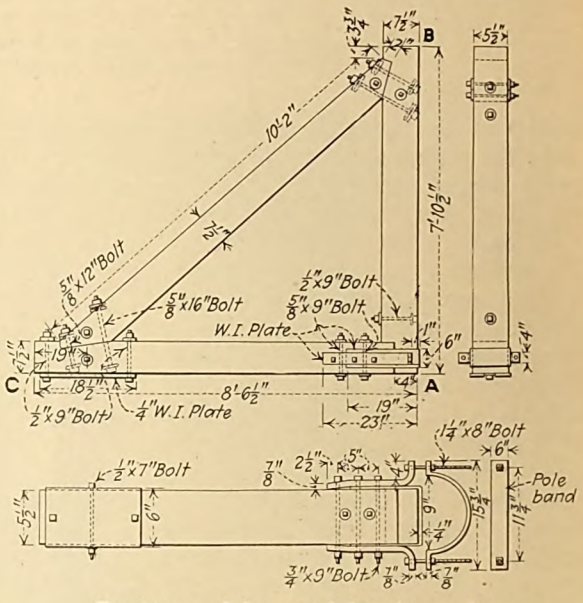
LINE DEPARTMENT—5

Fixture for Straightening Steel Poles*

By H. E. Bean
Engineer Way and Structures, New York State Railways, Syracuse, N. Y.

BENT steel poles are straightened on lines of the New York State Railways, Syracuse, N. Y., by using the device illustrated. After throwing slack into the span the pole is heated to a dull red color with a kerosene burner. The straightener is then fastened to the pole by a band at the bottom and a chain at the top. Two or three wraps of chain prevents sliding up of the pole. A jack is placed under the arm at *C* and the pole is bent back to the desired position and is bent back to the desired position and is allowed to cool without quenching.

If poles need reinforcing due to excessive strain, five reinforcing rods, each 5 ft. long, are wired around two light cast rings and lowered into the pole. This cage is held in a position midway above and below the ground line by securing the lowering wire. Concrete is then poured into the pole to the top of the reinforcing bars.



Device used for straightening poles

A—Band bottom. *B*—Top or chain attachment. *C*—Position where jack is placed.

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

SIGNALS—4

Apparatus for Checking Signal Relays*

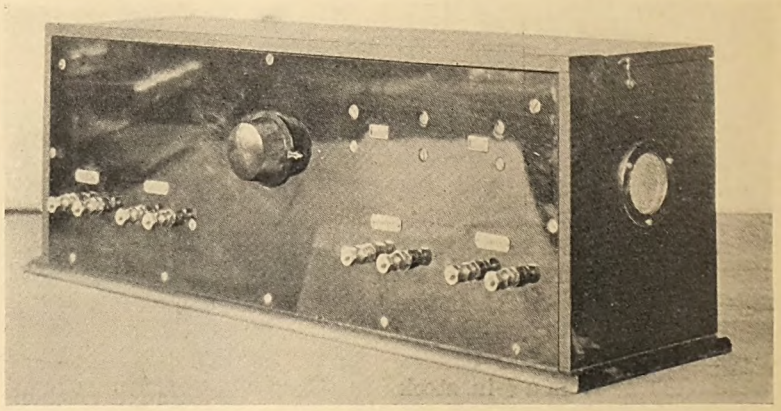
By W. R. Hornberger
Electrical Department, 60th Street Terminal, Philadelphia Rapid Transit Company, Philadelphia, Pa.

DESIGNED primarily for checking movements of relays for signal control, an apparatus has been developed by the shop forces of the electrical department, Philadelphia Rapid Transit Company, subway-elevated lines.

The apparatus consists of a motor-driven double-pole contactor and two electro-magnetic operated Veeder counters. The primary circuit is broken at one pole of the contactor through the primary counter magnet. The second contact interrupts the control circuit of the apparatus being tested. The secondary circuit is broken at the contact of the apparatus under test and operates the secondary counter magnet. If the device to be checked has no contacts a breaker for the secondary circuit may be attached to its moving parts.

A cam mounted on the oscillating shaft of a fan motor operates the contactor, and closes the contact once each revolution of the oscillator shaft. Speed variation is obtained by a rheostat. Motor, contactor and counter magnets are mounted in a small wooden cabinet. Ventilation is by a small fan on the motor shaft. The counters, rheostat and terminals are mounted on a Bakelite panel.

The contactor closes both circuits simultaneously and operates the primary counter. It also closes the control circuit to the apparatus under test. The secondary circuit is closed to operate the secondary counter. The counters should check.



Apparatus used to check the operation of moving functions of relays

*Submitted in Electric Railway Journal Prize Contest.

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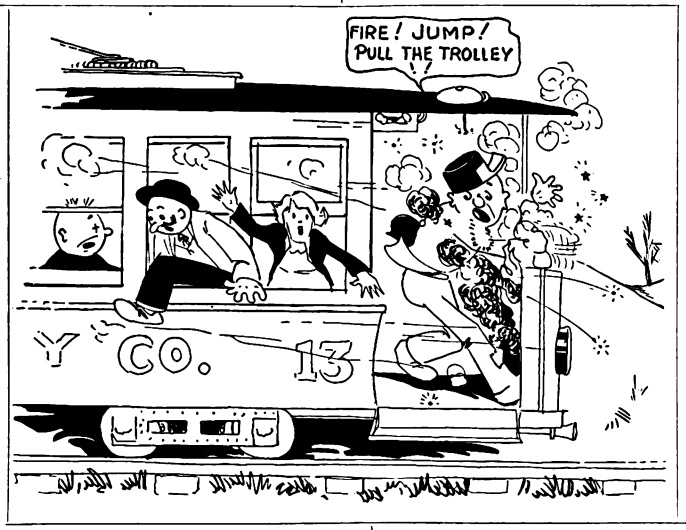
Adventures of

Old Man Trouble

on the

Hicksville Railway

Safety devices are to protect life and property and are not to be tampered with



IT MAY be a heroic act to save the cat from the burning deck, but why set the ship on fire? Furthermore, it may be considered heroic to stop a burning runaway car, but why jeopardize one's own life and those of others by setting the car on fire?

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, Westinghouse Elec. & Mfg. Co.

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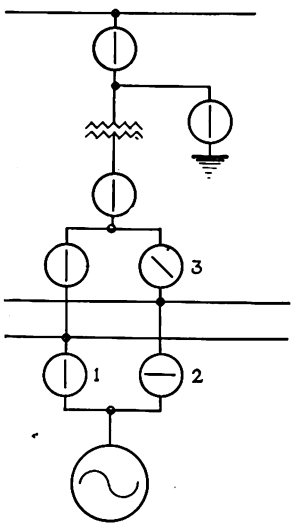
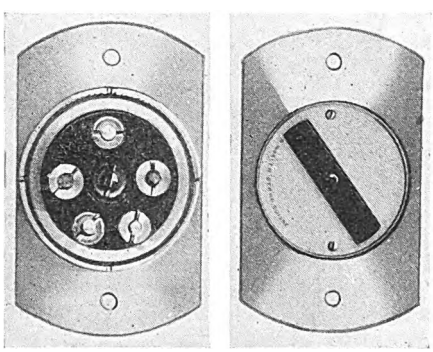
New Equipment Available

Three-Position Indicator

DESIGNED primarily for installation in a load-dispatching board to repeat the positions of various switches on the system, a new type of indicator is being marketed by R. W. Cramer & Company, Inc., New York, N. Y. This indicator is of the semaphore type giving three indications. It may also be used in interlocking boards to repeat the condition of track sections and show whether they are occupied or not by cars or trains.



Circuit diagram with indicators



Front appearance of indicator

The movement of the semaphore is obtained through either of two electrical magnets. Energizing either of these coils will cause the semaphore to move in either direction from its energized position through an angle of 45 deg., making the angular distance between energized positions 90 deg. The three indications given by the indicator, therefore, would be (1) switch closed; (2) switch open, and (3) in a position to indicate trouble.

The indicator operates normally on 12 to 14 volts direct current, although it may be operated on higher voltages with either direct or alternating current. The load per coil is 1 watt. Coils are designed for continuous service. The semaphore is restored to its de-energized position by means of a hair spring located behind the dial face.

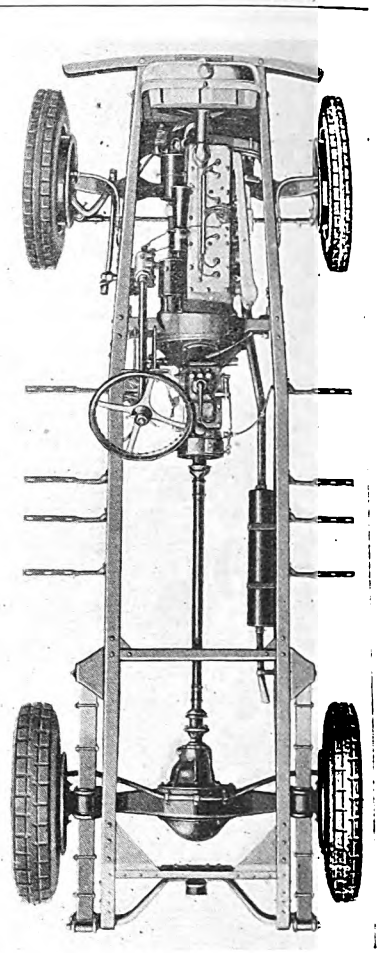
Among the advantages claimed for these indicators are that they occupy less space than lamps and require less power. One indicator will replace two lamps, and there are no filaments to burn out. The indicator shows the actual switch position graphically and facilitates supervision. It also eliminates optical errors.

These indicators are made in two sizes with dials $2\frac{1}{4}$ in. and $1\frac{1}{8}$ in. diameter. They are designed for flush installation on switchboard panels with control wire terminals in the rear.

New Line of Six-Cylinder Trucks

SIX-CYLINDER trucks in a complete new line are announced by Graham Brothers, which is the truck division of Dodge Brothers, Inc. These provide quick acceleration and braking together with fast economical service. A four forward speed transmission in the new 2-ton chassis gives added pulling ability for emergencies and makes possible moderate engine speed for fast long runs.

The six-cylinder engine has a seven-bearing crankshaft that weighs but 69 lb. Connecting rods are of chrome-vanadium steel and pistons of light alloy. The chassis is designed for minimum weight consistent with rugged strength. Lockheed hydraulic four-wheel internal expanding brakes provide quick and positive braking and make control easy. In addition to the hydraulic brakes the hand lever operates a propeller shaft brake for use when the truck is parked.

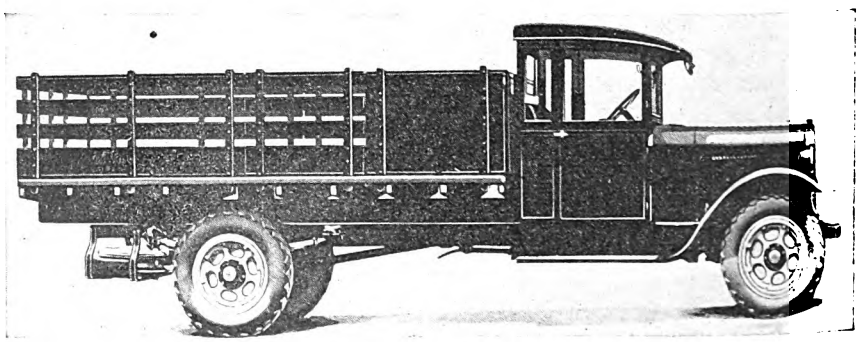


Chassis for new 2-ton truck

"Uneeda" regular and systematic schedule of inspection and maintenance.

Changes in Visible Thermostat

SEVERAL changes in its new visible thermostat are announced by the Railway Utility Company, Chicago, Ill. The upper end of the mercury tube is held in place by a



Equipment arranged with stake body

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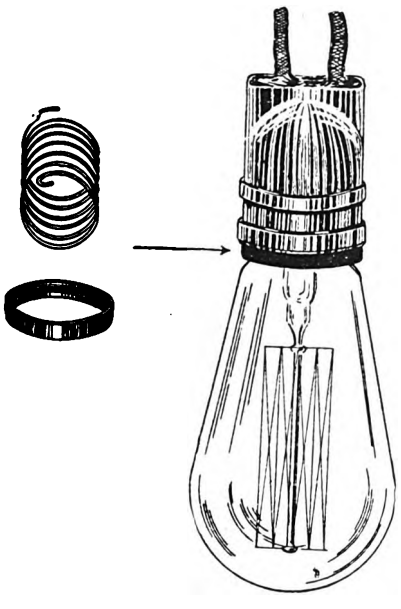
transparent glass front, while the lower end is held by a copper tube encircling the bulb. This copper tube terminates in a circular projection on the lower outside end of the metal case and acts as a heat exchange element. It is heat insulated from the case and responds quickly to changes of temperature in the car.

A molded rubber bushing on the upper end of the thermometer tube acts as a cushion against shock. A molded insulation back may be screwed permanently to the car wall. If it is necessary to change the temperature setting the mercury tube must be replaced. To remove this two screws are taken out which clamp the thermometer case to the molded back. Two additional screws which hold the mercury tube provide for easy removal and replacement.

Lock for Weatherproof Sockets

LAMPS can be locked in molded composition weatherproof sockets by a construction just announced by the Ren Manufacturing Company, Winchester, Mass. The locking mechanism consists of a coiled spring and a grooved ring. A particular style of punch is used to apply the lock to the socket. The Ren lock grips the base of the lamp.

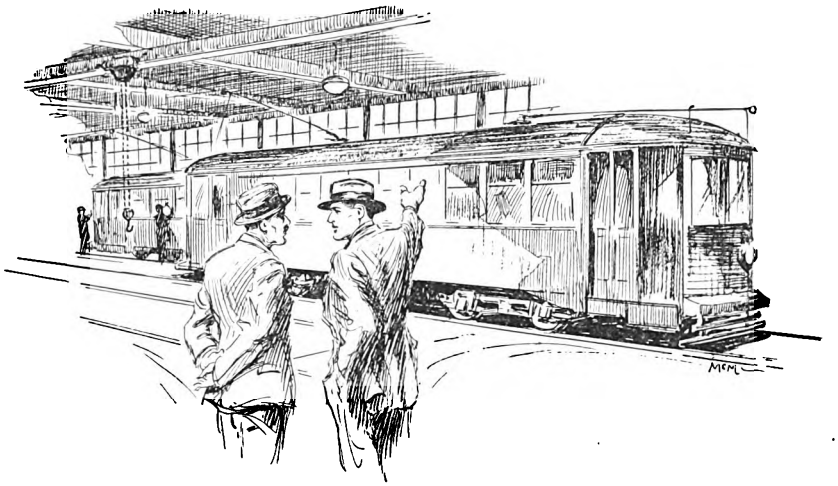


Lamp lock applied to weatherproof sockets

This type of lock has been previously applied to brass and porcelain sockets, but the new development is in connection with weatherproof sockets for lamps used out of doors or in damp locations.

Dick Prescott Fires Welcher

And Closes an Unpleasant Incident



DICK PRESCOTT, assistant superintendent of the Consolidated Railway & Light Company shop, was amazed at the story told by Shorty Green, ringleader of the disaffected men in the truck shop. This confession, however, explained to Dick many things that had mystified and worried him for some time.

The young executive acted promptly and summarily. Soon after the committee representing the truck shop men had left his office, he called in Pete Welcher, whose jealousy of Dick's rapid promotion had prompted his attempt to breed discontent among the men. After reviewing the facts briefly, Dick informed Welcher that his services were no longer required in the Consolidated shop.

Caught red handed, Welcher showed his true colors, first by trying to shift the blame to some of his recent pals and then, when he realized that wouldn't work, by pleading ignobly for his job. This only served to confirm Dick's judgment of the man. He told the ex-inspector bluntly that treachery and double dealing had no place in the Consolidated organization.

When the word that Welcher had been dismissed spread through the shop there was a general feeling that he had been treated only as he deserved. Late in the afternoon, Dick's old friend Steve White, the carpenter shop foreman, came into his office to congratulate him on getting rid of a trouble maker. Although Dick had become Steve's superior, he never forgot his early days in the shop and the two men were fast friends. Dick always welcomed Steve's advice and frequently discussed general shop problems with him. The subject of Pete Welcher was soon dismissed, and Steve referred to the work of his own department.

"We're getting cleaned up in good shape this week, Dick, and our record of damaged cars held out of service for the month is going to show a big drop over last month."

"Fine! I'll bet that will make the transportation department sit up and take notice, eh?"

"Yes, you bet it will," replied Steve. "Those fellows are right up on their toes and they're after every car they can get."

"Good enough; that's the way they ought to be. Do you know, Steve, I've given a lot of thought and study to this business and the more I think about it, the more it fires my imagination. Why, say, some of these croakers that think the transportation business is on the way out are dead from the neck up. In my judgment the real trouble with this business has been that it nearly dried up from the inside out."

"I can understand that, all right," commented Steve.

"Understand it! Of course you can. You're the first fellow who got me thinking straight. Gee, I shall never forget the first week I spent in this shop! Even now, nearly every time we have a conference on a new idea somebody pops up with the old wet blanket hymn, 'We tried that twenty years ago.' Some day I'm going to have a framed sign hung in my office that will read, 'You ought to be twenty years wiser than you were twenty years ago.'"

"That sounds like good sense, all right, Dick, but seriously, I do think we're making real progress these last few months."

"I think we are too, Steve, but we're only starting. I've had one or two new things definitely in mind for several days. Come on down to the shop a minute, I want to go over them with you."

Without further discussion the two men went out into the shop. Dick led the way through the repair shop to one of the most recent types of cars that had been purchased on the property.

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Association Activities

Power for Dorchester Extension*

By F. N. Carothers
General Foreman of Substations Boston Elevated Railway

CONSTRUCTION of the Dorchester rapid transit extension necessitated the building of a new automatic substation, located on Dickens Street near Fields Corner. This station furnishes energy not only for the rapid transit line but for the surface cars in this district as well. The equipment consists of two 3,000-kw. shunt-wound converter units with single-phase, outdoor, oil-cooled transformers. Alternating-current energy is transmitted through two 13,200-volt, 25-cycle, three-phase, No. 0000 underground cables, direct from the generating station in South Boston. Two other a.c. cables that will be used as an emergency feed are connected across town to the bus of Eggleston substation. Direct current is distributed to the lines for car service through eleven 1,000,000-circ.mil and seven 2,000,000-circ.mil feeders.

The transformers change the 13,200-volt, 25-cycle power to 440 volts for converter supply, being connected through oil circuit breakers, Y for starting and delta for running. The delta-connected oil switch is connected 30 electrical degrees ahead of the Y-connected oil switch. This gives very smooth operation in changing from starting to running position.

3,000-Kw. Converters Are Used

The converters are General Electric six-phase, shunt-wound, commutating-pole, 3,000-kw., 600-volt type. The direct current drops 5 to 6 per cent between no load and full load. They can be started and stopped by means of the supervisory system, but it is customary to allow them to function on load demand. Either converter can be made the leading or trailing unit, by the throwing of the hand-operated sequence switch. The leading unit goes into service through low-sustained trolley voltage on the d.c. bus, and the trailing unit goes into service when the load on the leading unit has reached its capacity for a period of 30 seconds. The units are shut down in the reverse order. The trailing unit drops out when the load has dropped to a point where one machine will safely carry it. The leading unit shuts down when the load remains at about 20 per cent of its capacity for a period of two minutes. At this point the tie feeders with manual stations are sufficient to keep the bus voltage normal. In event of failure of the leading unit to go into service, the trailing unit, after a short timing period, goes into service, and the supervisory notifies the system operator that the leading unit has failed.

The machines are protected from severe overload on the d.c. side by means of the MC-2 air circuit breakers in eleven d.c. surface feeders, and JR-10 high-speed circuit breakers in seven d.c. rapid transit feeders. There are also load-limiting resistors in the positive leads of the machines that will hold them to their commutating capacity, even if the d.c. bus should become grounded. These resistors also give a cushioning effect as the machines go into service. They are located in the basement directly below the converter. This is a departure from the usual practice, but has given no trouble in another station that has been in service for almost two years. The overload trip on the hand-operated d.c. machine circuit breaker has been allowed to remain on the breaker and is not set for any higher current than those of machines of the same capacity at manual stations.

It was thought that for this particular installation it would be better not to use high-speed circuit breakers in either the positive or negative side of the converter, as all d.c. feeders are tied into the system network, and trouble developing on one feeder, causing a blowout on the converter might result in the loss of several manual stations. It was decided, however, to protect the rapid transit feeders with high-speed circuit breakers and to use MC-2 breakers on the surface feeders.

At the present time three sections from this station feed the rapid transit lines, two of which consist of two 2,000,000-circ.mil and one of three 2,000,000-circ.mil cables. Each cable has its own high-speed circuit breaker connecting it to the station d.c. bus. In case of a section blowout, it is necessary for all breakers on a particular section to close simultaneously. Otherwise the first breaker to close would try to take the total load of the section, which it could not carry, and would blow out again just about the time the second breaker was closing. This also would blow out, resulting in a pumping action, and not restoring power to the section. Of course if it were possible to set the time delay reclosing relay exactly the same on all breakers of a particular section, this would not happen.

Insuring Opening of Relays

These relays are of the PQ time delay closing and instantaneous drop-out type, and cannot be set for absolute accuracy. To get around this feature it was necessary to connect the closing side of all No. 102 relays of each section in parallel, so that the first No. 102 to close would close all circuit breakers of the section. The first No. 102 was set to operate in seven seconds, the second in nine seconds and the third in eleven seconds. This also offers the advantage that should the first relay fail, the second or third relay would operate the breakers. The breakers would not close back on short circuit, for after a breaker opens, a resistance which is connected across the breaker feeds power to the fault, and the short-circuit detector holds it out until the load is such that the section will not be overloaded when it closes.

The actual operation of the reclosing feature is as follows: A circuit breaker blows out; the resistance of 15 ohms, which was shorted out by the breaker, allows some power to feed out on the cable. At the same time a B switch on the circuit breaker starts time delay relay No. 102 to start timing. When this relay has completed its timing and closes its contact, a circuit is completed to the M and N coils of the reclosing relay No. 182, but the torque of this coil is not sufficient to operate the contacts, and must wait for the aid of the A. B. coil that is connected from the feeder to the negative bus. If a grounded cable or third rail exists, the drop across the A. B. coils will be 0.

* *Abstract of a paper read at meeting of New England Street Railway Club, Boston, Mass., Oct. 27, 1927.*

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 28-30*—American Institute of Electrical Engineers, regional convention, Drake Hotel, Chicago, Ill.**

***Dec. 1-2*—Pennsylvania Street Railway Association, annual meeting, Scranton, Pa.**

***Dec. 2*—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York, N. Y.**

***Dec. 2*—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.**

***Jan. 16-17*—Midwest Electric Railway Association, Hot Springs, Ark.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.**

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and it cannot give any aid to the MN coil. The consequence is that the circuit breaker cannot reclose and must wait until the trouble has been cleared, or for load to be reduced to a point where the drop across the A. B. coil will allow No. 182 to close its contacts, which recloses the circuit breaker.

In addition to functioning automatically, all pieces of apparatus in this station have supervisory control and indication from the system operator's office. That is, the system operator can start, stop or lock out of service either converter found open, close or lock out any a.c. or d.c. cable, as he desires, provided, of course, that all automatic features function. He cannot start a rotary if it has flashed over, has grounded windings, overheated bearing, or windings, or anything that might cause serious trouble.

The supervisory is of the Western Electric 8A distributor type, and allows system operator to give as many operations as desired, either opening, closing or both, at the same time. After an operation indication is given in five seconds. The position of all pieces of apparatus is checked at five-second intervals. Watt-hour meter readings on both converters, and R. T. feeders are transmitted to system operator's office over this supervisory.

Four No. 22 telephone wires rented from the New England Telephone & Telegraph Company are used from substation to system operator's office. The use of these wires are: One for operation, one for indication, one for synchronizing the distributors and the fourth is a common for all three.

Energy for rapid transit signals is supplied from two 50-kva., 13,200 to 600-volt, 25-cycle, single-phase transformers. Only one is being used at present, the other being held as a spare. The low-tension oil circuit breaker on the signals will reclose three times in case of trouble and then lock out. The supervisory notifies system operator on each operation and finally that is locked out. There are about ten seconds between first and second reclosing, and twenty seconds between second and third reclosing. The lockout only occurs in case of three consecutive blowouts in a space of about one minute.

While this station is completely automatic, it can be changed to manual operation, even with a complete failure of all automatic devices, in a period of about two minutes. For the ultimate extension to Ashmont, another similar station will be required on Beal Street near the Ashmont station. The order for electrical equipment has been placed.

New Features Embodied in Cars for Dorchester Extension*

By E. P. Locke
Engineer of Car Construction Boston Elevated Railway

PRIOR to receipt of the new cars for the Dorchester extension 95 similar cars were in use on the Cambridge subway. The general arrangement of the Cambridge subway cars embodies longitudinal seats, extending the full length of car at each side, except at door openings; three sliding doors on each side and a sliding door and gate at each end. The motorman's cabs are located in the right-hand diagonal corners of the car. These cars are 69 ft. 2½ in. long over all, with 51-ft. truck centers, and 9 ft. 6 in. wide, and are mounted on one trailer and one motor truck. They were purchased in three lots and are known as No. 1, No. 2 and No. 3. The 60 new cars are designated as No. 4.

The design of the No. 4 car, while in general the same as the earlier cars, differs in certain respects: The side doors on the old cars are arranged to slide into pockets in the sides of the car. The No. 1 and No. 2 cars have wooden doors, but on the No. 3 car they are constructed of steel. All are operated by means of compressed air. On the No. 4 cars they are arranged to slide on the exterior of the car body, are constructed of wood covered with aluminum, and are actuated by means of electric mechanism. Provision is also made for hand operation, should that necessity arise.

The reasons for these changes are: Saving in weight, original cost, and in maintenance cost, due to the elimination of the door pockets; elimination of accumulation of snow in door pockets; increase in the inside width of car for passenger accommodation; elimination of unavoidable waste of air at door engines and of cold weather troubles such as slow door movement and failures due to freezing at valves.

The front edge of each side door on the No. 4 car is equipped with a wide molded rubber striker which closes against a flexible striker on the door post, instead of a single smaller bumper on the door only, as on the earlier cars. With this arrangement a person may easily withdraw a hand or foot without injury, should either become caught when the door is closed.

The weight of each side door, including hanger and fittings, is 110 lb., against approximately 190 lb., the weight of an all-steel door, a saving of 80 lb. per door. The total saving per car, in door weights, including side, end and cab doors, is approximately 640 lb.

Electric door engines are located under the seats and have a shaft extending through the side of car. To the outer end of this shaft is attached an arm that engages in a track on the back edge of the door. The operation of the doors is controlled by means of push button switches at both ends of the car, this arrangement being the same on all Cambridge cars.

All end doors and gates are inclosed in pockets in the end of car, when in open position. On the No. 1, No. 2 and No. 3 cars, the gate is outside the door, and, due to its construction, will allow snow to blow into the pocket to such an extent as to interfere with operation. On the No. 4 car this arrangement is reversed, i. e., the door is on the outside. It is fitted with a double weather strip at the back edge, which, it is believed, will prevent snow from entering the pocket and will also stop, to a large extent, the cold drafts at this point.

Lightness Gained in Composition Flooring

Combination of steel and composition floors used in this type of car has, in the past, resulted in a weight varying from 8 to 12 lb. per square foot, depending upon the material used. The reason for this is that it has been necessary to apply the composition to a thickness of 1 in. or more to withstand the tendency toward cracking, due to vibration and slight movement of the car frame. Flooring material is now available, however, which does not require the excessive thickness heretofore necessary and which has more or less flexibility to withstand the car vibrations. On the No. 4 Cambridge cars, the floor composition was specified to be laid to a thickness of $\frac{3}{8}$ in.

All floor material is subject to more or less wear, and must, in time, be repaired. To repair the thick composition floors, it has been necessary to rough up the old material, and, in some cases, to chip it out in order to apply the new material in a sufficiently thick layer to prevent cracking. Some trouble has been experienced, also, in obtaining a good bond between the old and the new materials. It is expected that these troubles have been overcome in the material used in the new Cambridge cars, as experience has shown that resurfacing may be done by first cleaning the floor and then applying the material in thin layers until the floor is again brought to its original level.

The supporting plates on which this material is laid consist of two sheets of No. 22 U. S. S. gage copper bearing steel in which have been pressed staggered rows of oval shaped cones or depressions. Two such sheets are placed together so that the top of the cones of one sheet touch the top of the cones of the other. The two sheets are then riveted together through the cones. This results in a structure $\frac{7}{8}$ in. thick, the surfaces of which are flat, except for the depressions, and which provides an air space between the sheets of approximately $\frac{1}{8}$ in.

After they are riveted together, the sheets are dipped in rust-proofing paint. These sheets are applied to the car frame in lengths to extend from side sill to side sill and 30 in. in width, the frame being designed so that a supporting member or a splice plate will come under each

*Abstract of a paper read at meeting of the New England Street Railway Club, Boston, Mass., Oct. 27, 1927.

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joint. The joints are made by inserting a freshly painted wood strip in the edge of one sheet and then telescoping the adjoining sheet into it.

Bolts are then inserted through the sheets, the wood filler and splice plates, or the supporting member of the frame. Wood strips are also inserted at the outside edges of the sheets before they are bolted to the side sills. In this way a practically sealed air space is obtained between the top and bottom members of the sheets, which serves as an insulator and which should have a tendency toward a warmer floor surface in cold weather, and also a tendency toward sound deadening.

The combination of the steel sheets and the surfacing material, as applied to the No. 4 car, results in a floor thickness of 1¼ in., ⅛ in. of which is dead air space, and the weight of which is 6 lb. per square foot, or a total saving in weight of approximately 1,300 lb. per car, when compared with the 8 lb. per square foot weight.

All Cambridge subway cars, previous to the No. 4, have been equipped with spring upholstered seat cushions and backs when purchased. In the No. 4 car these have been displaced by wood slat cushions and backs at a material saving in weight and a decided improvement from a sanitary and maintenance standpoint.

The slats are only ½ in. thick. Those in the cushion are secured to galvanized corrugated iron sheets, which serve as the supporting member, and at the same time meet the requirements as to fire protection over the heaters and other electrical apparatus. The backs consist only of the slats, which are attached to ⅛-in. pressed-steel angles, bent to the proper shape and attached at top and bottom ends to the frame. The saving that is made in weight per car on this item is 429 lb.

New Lighting Scheme Employed

The appearance of the interior of the car is somewhat different from that of the older cars, due principally to the different lighting scheme. Instead of the old arrangement of three rows of 36-watt lamps, without reflectors, the new cars have ten 94-watt lamps mounted in pendent type, statuary bronze fixtures having glass reflectors. These are arranged in a single row at the longitudinal center line of the car. Interspersed with these are five emergency lamps that are also equipped with glass reflectors of similar shape, although smaller than those of the regular lamps. If, for any reason, the electric current fails and the 94-watt lamps are cut out, the emergency lamps are automatically cut in through a relay, so that the car will not be in darkness.

An improvement from the standpoint of appearance and also with respect to maintenance cost is the adoption of electric tail lights in place of the old-type steam railroad oil lamps that are carried on brackets at the ends of the cars. The tail lights on the new cars are arranged in permanent boxes constructed in the ends of the cars, only the red lens and lens-retaining casting being visible from the exterior of the car. Each box is equipped with one 36-watt lamp for regular use and with one emergency battery lamp. As in the case with the interior lighting, the emergency tail lamps come in on loss of the regular current, or in case of a failure of one of the regular 36-watt lamps in this circuit.

In cleaning windows considerable time is lost in thoroughly removing the dirt from the corners of the glass, and, if care is not exercised, it is apt to accumulate at these points, resulting in an unsightly appearance. To overcome the need for cleaning the corners and also to remove the unsightly appearance should dirt accumulate, sanitary corners, so called, have been applied to all sash, both inside and outside the glass, except at sash lifts, where they are outside only. These consist of thin pieces of brass laid against the surface of the glass and flanged over the edges. They are applied when the sashes are glazed and are held in place by the glazing rubber.

In the earlier lots of cars no provision was made for heating the motorman's cab. This has been arranged for on the No. 4 cars, however, by utilizing a portion of the heat from one of the regular heaters under the longitudinal seat adjacent to the cab. The top of the heater is perforated, thus allowing the warm air to pass up through into a duct which carries it to the cab partition, where it enters the cab through a grille-covered opening. The upper portion of the cab partition contains a permanent wire screen, over which may be drawn a duck curtain to exclude light when the cab is used for operating purposes. This arrangement replaces the sliding steel panel used on the earlier cars, and will result in some saving in maintenance cost.

Frequent, Thorough Inspections Reduce Car Failures*

By Henry Cordell
Master Mechanic Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

REGARDLESS of what type of equipment may be purchased by any system a proper periodical inspection and overhauling must be carried on. There is a divided opinion as to how and when inspection and overhauling should be done. Some companies inspect on a car mileage basis, others on a daily basis, and still others on a kilowatt-hour basis. Each one presumably is getting satisfactory results. On our road we use the mileage basis, inspecting all equipment on our rails on a 1,000-mile basis and giving a general overhauling every 100,000 miles. We have found it advantageous also to carry on a daily terminal inspection. An inspector is on duty to adjust brakes, change trolley poles and repair minor defects that may be found or reported by crews operating the train. Taking cars out of service and interfering with schedules is thereby avoided.

With multiple-unit interurban cars such as we use the control jumper plays a vital part and is given a rigid test periodically. The transportation department is requested at the first of each month to return to the shops all jumpers for tests. Jumpers tested and found perfect are painted a certain color. The four colors red, green, white and black are used each month in turn. Careful observation has shown that after four months individual wires in the cable begin to break and that failures will occur if the jumper should be retained in service. After years of experimenting we adopted the following jumper cable specifications:

Each conductor consists of 104 strands of No. 32 B.&S. gage tinned copper wire braided around a No. 19 B.&S. gage tinned steel piano wire center. The insulation consists of paper wrapping, ¾ in. of pure Para or Hevea rubber and single soft cotton braid. The conductors are arranged around a hemp center and laid in a twist of 6⅛ in. to 1 ft. for inside conductors and one turn to the foot for outside conductors. This is important, as we desire no twisting action when jumpers are made up to a length of 36 in. The twelve cables are finally covered with a double braid, tightly woven and saturated with a weatherproof compound. The compound used for filling receptacles or heads consists of 50 per cent rosin and 50 per cent beeswax. This mixture is a perfect waterproofing compound of high dielectric strength.

Control Equipment Must Function

Next in order of importance to keep a train on time is the proper functioning of the control apparatus on the car. Resistance failures can be reduced to a minimum if the grids are properly installed in the first place and a rigid inspection is followed. The insulation between frames and hangers should be porcelain spools over micarta-insulated bolts. The grids should be drawn together as tightly as possible. Burning between grids is inexcusable and will not occur with proper inspection. All terminals at junction boxes, controllers, circuit breakers, switches and resistance should be checked at every inspection, and if found loose or showing signs of overheating should be taken care of then. Switch parts, controller fingers and segments should be renewed before they are worn to the extent where failure may occur while the car is on the road.

**Abstract of a paper presented at the annual convention of the Operators' Section, Iowa Electric Railway Association, Davenport, Iowa, Nov. 2 and 3, 1927.*

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There is no economy in the "I guess that one will last another inspection" method.

Serious delays to the service are caused by hot boxes, particularly on journal bearings. Extremely hot or very cold weather aggravates this kind of trouble, the viscosity of the oil being the determining factor. It is impossible to change oil over night to meet the climatic conditions, therefore a positive means of getting oil to the journals must be provided. The capillary feed of wool waste will not provide sufficient lubrication for much more than 2 in. For high-speed service we found it necessary to carry enough oil in the boxes to keep well inside this height. Before leaving terminals on very cold days, on the first trip out we pour a small quantity of oil along the journal on top of the waste so that lubrication is provided until the journal becomes warm.

Bearing Metal Requires Careful Handling

Journal temperature increases with speed, and prolonged high-speed running brings the temperature up to a point where lubrication is difficult. Greater care should be taken in babbitting journal bearings and in proper machining, so that newly fitted bearings have a contact surface sufficiently large to carry a load not to exceed 300 lb. per square inch of projected bearing surface. Journals badly worn, tapered or out of round cannot meet the requirements and must be trued. This is standard practice in our shops when new wheels are being mounted. We do not permit axles to remain in service with a taper exceeding $\frac{1}{8}$ in. or below $\frac{1}{4}$ in. of the original size.

Care should be taken that the babbitt used in bearings is not overheated. Most alloys used for journal linings will not give good service if heated over 800 deg. F. The old pine stick for determining the heat of molten babbitt should be discarded and a pyrometer used. Proper tinning is necessary to obtain thorough amalgamation. We have experimented with several kinds of tinning, and find that satisfactory results are obtained by using for tinning the same babbitt that is used for pouring, provided the proper temperature of the shell is maintained and the surface is perfectly clean. Journal bearings are made from a composition of 70 per cent copper, 5 per cent tin and 25 per cent lead. For the other bearings we use babbitt metal of 89 per cent tin, 4 per cent copper and 7 per cent antimony.

Limit gages for determining wheel flange wear are furnished the inspectors and a close check is kept on wheel conditions. The gage is made with a generous allowance, so that at all times wheels are removed from service for turning before condemning limits are reached. Axles are tested whenever taken out of service by careful cleaning with gasoline, subjecting them to blows from a 12-lb. sledge and observing under a powerful magnifying glass. The smallest crack condemns the axle. Only hammered, heat-treated, steel axles are used.

If air-brake piping is installed without regard to proper clearances, is sprung into place when connected, is poorly cleated or if there is not enough radiation allowed between compressor and tanks, you may expect trouble from freeze-ups and generally poor performance. Repair work should be assigned to men in a separate department, as nearly free from dust and noise as possible. Local cleaning of triple valves, feed valves and other apparatus, except brake cylinders, should not be done when the car is in for inspection. Enough spares should be on hand so that the inspector may install a clean, adjusted and tested unit. Home-made test racks may answer the purpose, but for reliability and accuracy special test racks should be used. Dead weight testers for gages should be available so that inspectors may check their gages at frequent intervals. Replacement of air hose should be periodical. One year seems to be the natural life of air brake hose but conditions may shorten it. Inspectors should use their judgment in replacing and be held responsible for road failures.

Preventing Air Freeze-Ups

Freeze-ups of radiation pipe can be avoided by installing a safety valve mounted on a pipe about 18 in. long and tapped about 6 or 8 in. from the compressor head on the discharge line. We set this safety valve at 5 lb. above the pressure at the tank. We have found that the opening into the tank is not entirely closed when this valve opens with each stroke of the compressor. This gives the operator ample warning. By heating (a fuse being used at the tank) the obstruction is quickly removed. Not a single car equipped with this simple device has been taken out of service in several years.

Renewal of trolley wheels or slides should be determined by limit gages. This will effect a saving of delays as well as serious damage to overhead, due to use of wheels or shoes too deeply worn. Trolley bases should receive the same attention as other electrical devices on the cars. The spring tension should be tested with a dead weight and a standard pressure adopted. We carry 35 lb. pressure against the wire. This may seem high, but it is necessary at high speed and on locomotives where heavy currents are required. Retrievers are tested in a rack which simulates road conditions. They are painted to indicate the inspection date, as are the jumpers. Trolley bases are inspected and painted in a similar manner.

Motor Leads Must Be Protected

Motors give little trouble, but the leads which cannot be protected from mechanical injury by conduit are subjected to extremely hard usage and give trouble unless properly located, properly cleated and properly protected. A wire armor consisting of No. 12 steel spring wire closely wound and slipped over the motor leads will protect them against mechanical injury. Motor leads should be rather long to provide slack on sharp curves or in raising the car body for inspection and greasing. As the cars come in for the 1,000-mile inspection a thorough examination is made of the hoods, wire bands, brush-holders and commutators, leads, lateral motion, bearing wear, etc.

One of the greatest mistakes is to allow temporary work, which if continued will sooner or later ruin the best equipment obtainable. The smallest crack in a wheel or axle or part of a truck or brake rigging, or the slightest irregularity in the operation of an electric circuit, invariably leads to serious delays, possible loss of life and extended damage to equipment.

Southern Equipment Men's Meeting at New Orleans

NEW ORLEANS has been chosen for the next meeting of the Electric Railway Association of Equipment Men, Southern Properties, which will be held there on Jan. 25-27, 1928. Headquarters will be at the Roosevelt Hotel.

A.I.E.E. Regional Meeting at Chicago

SEVERAL papers of special interest to electric railway men will be presented at the Great Lakes regional meeting of the American Institute of Electrical Engineers to be held at the Drake Hotel, Chicago, Ill., on Nov. 28-30. The entire Tuesday afternoon session will be given over to the subject of railway electrification and industrial application. Bion J. Arnold will preside. The following are the papers on railway subjects:

"Illinois Central Electric Operating Experiences," by W. M. Vandersluis, Illinois Central Railroad.

"Operating Experience with 125-Ton Storage-Battery Locomotives in Chicago Railroad Terminals," by Edward Taylor, General Electric Company.

"Operating Performance of Rectifiers," by Caesar Antoniono, Chicago, North Shore & Milwaukee Railroad.

Other sessions at the convention will include a symposium on 132-kv., single-conductor, lead-covered cable, one on power systems and one on communication. The Monday sessions will be devoted to a student convention, several problems of design being considered.

British Standard Rails

REVISION of the British standards for tramway rails and fishplates has been made and the British Engineering Standards Association has issued a revised edition of the standard specification covering them. The basic bessemer process for the manufacture of the steel has been eliminated in accordance with a recent decision of the association. A new dwarf rail section (No. 10, 95.4 lb. per yard) has been introduced, intended for carrying heavy loads. Copies of the specification may be obtained for a nominal fee from the association, 28 Victoria Street, Westminster, London, S. W. 1.

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American Association News

American Executive Committee Discusses Depreciation

CHIEF interest at a meeting of the American executive committee held on Nov. 11 at association headquarters, centered in discussion of the depreciation hearings now being held before the Interstate Commerce Commission. Dr. Thomas Conway, Jr., chairman of the sub-committee on depreciation, presented a very clear picture of the situation. He pointed out that the Interstate Commerce Commission interprets the transportation act of 1920 as a mandatory order to formulate rules for depreciation and to prescribe percentages of depreciation for various classes of property involved. In 1924, the commission promulgated a tentative order and at that time the sub-committee on depreciation was formed for the purpose of representing the electric railway industry. The final orders were promulgated in 1926, designed to cover conditions of telephone companies and steam railroads. A few months later the commission served notice on the electric carriers requiring them to show cause why a similar order should not be made to apply to them.

If the steam railroad classification were applied to the electric railways the provisions concerning depreciation would be detrimental to the interests of the latter. First, it is required that all past depreciation be set up on the books as a liability. The effect of this order, Dr. Conway pointed out, would be to wipe out the surplus of a good many companies and cause a deficit in others.

Secondly, many of the major maintenance expenses such as renewal of rails, ties, ballast, special work, etc., are transferred from operating accounts and are to be covered by three accounts: Depreciation of Way and Structures, Depreciation of Equipment and Depreciation of Power Plant. This change would have the effect of destroying the landmarks which executives have used for years in gaging the efficiency of their operation. It would be impossible to compare the new operating costs with those of previous years because of this radical alteration. Moreover, it would be required that the companies set up a definite amount for depreciation each year and divide it by 12, for each month. The consequences of that would be that in time of business depression, when traffic falls off, it would be impossible to defer maintenance and renewal programs for the purpose of conserving the net revenue. This again would seriously threaten the financial status of the electric railways.

Thirdly, it would require that the executives of the companies in their annual reports to the commission state the extent to which maintenance has been deferred or neglected and swear to the accuracy of the statement. Dr. Conway said that this would be a serious matter in lean years. The information becomes a matter of public record and many people undoubtedly would take such statements to the bankers and it would tend to impair credit and diminish traffic, because of the feeling that the railway was unsafe on account of deferred maintenance.

The co-operation of the Investment Bankers Association has been sought to prevent the application by the Interstate Commerce Commission of these rulings to the electric railways. It was brought out that approximately one-third of the electric railways come under the jurisdiction of the Interstate Commerce Commission. A more serious phase of the situation, however, is that the various state commissions probably would follow the lead of the I.C.C. so that in a short time its rulings would affect the entire industry.

The present status of interstate bus legislation was outlined by J. H. Hanna, chairman of the committee on national relations, and L. S. Storrs. The recommendation of the national relations committee that passage of the Denison bill be favored was adopted. This differs from the bill proposed by the electric railways two years ago only as regards the so-called "grandfather clause." It does not apply to automobile trucks.

Routine business of the meeting included the reports of the committees on publicity presented by J. W. Welsh; membership by C. E. Morgan; finance by T. A. Kenney and convention location by Frank R. Coates. It was brought out in the report of the finance committee that the revenues of the association this year are expected to be substantially larger than last year on account of the new dues. At the same time, the association has taken over the activities formerly sponsored by the Advisory Council and the expenses will be correspondingly increased. Otherwise, no important changes from the appropriations of the preceding year were recommended by the committee.

A resolution was presented by W. H. Sawyer expressing the sincere grief felt by the executive committee in the death of Harry L. Brown. The vacancy thus created was filled by the election of E. F. Wickwire, vice-president of the Ohio Brass Company.

Plans of the Engineering Association were touched upon briefly by R. H. Dalgleish. He mentioned particularly the valuable results that are being obtained by the committee on welded rail joints. Edward Dana said that the work of the Transportation & Traffic Association for the coming year is already under way. J. S. Kubu presented a resolution expressing the great interest of the Claims Association in the Hoover Conference recommendations. T. B. MacRae spoke of the necessity of co-ordinating the work of the Accountants Association with that of the American Association in connection with the Interstate Commerce Commission classification of accounts.

Representatives of five state and sectional associations spoke briefly. These were R. F. Carbutt, Metropolitan Section A.E.R.A.; H. B. Potter, Maryland Public Utilities Association; W. R. Power, Kentucky Utilities Association; A. E. Reynolds, Missouri Public Utility Association; and R. B. Stearns, New England Street Railway Club. Mr. Stearns mentioned the importance of keeping the various public utility information bureaus out of politics.

Past-President George H. Harries expressed his interest in the matters now being discussed with the Interstate Commerce Commission and recalled some of his own experiences along similar lines in previous years. A suggestion was made by Luke Bradley that a half hour be set aside at each future meeting of the executive committee for a general discussion of the state of the industry.

Members present at the meeting were: R. P. Stevens, president; J. P. Barnes, J. H. Hanna, C. E. Morgan, L. S. Storrs, W. H. Sawyer, T. B. MacRae, J. S. Kubu, R. H. Dalgleish, Edward Dana, G. A. Richardson, T. A. Kenney, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, L. C. Bradley, J. H. Alexander, D. W. Snyder, Jr., J. G. Barry, J. R. Fitzpatrick, J. W. Welsh, and Past-Presidents F. R. Coates, J. N. Shannahan and G. H. Harries.

New Association Members

ELEVEN manufacturing companies and twelve individuals were elected to membership in the American Electric Railway Association at the meeting of the executive committee held at association headquarters Nov. 11. Eleven of the new individual members are affiliated with the Engineering Association and one with the Transportation & Traffic Association. A list of the new company members follows:

Air-O-Pure Company, Cleveland, Ohio.

Ajax Manufacturing Company, Newtonville, Mass.

American Wicker Works, Minneapolis, Minn.

Asbestos Spinning & Weaving Company, New York, N. Y.

Fraser Electric Transmission Corporation, Cleveland, Ohio.

Highway Trailer Company, Edgerton, Wis.

McGill Metal Company, Valparaiso, Ind.

Moccasin Bushing Company, Chattanooga, Tenn.

Page Steel & Wire Company, Bridgeport, Conn.

L. Schiavone & Bonomo Brothers, Jersey City, N. J.

Special Bolt Machinery Corporation, New York, N. Y.

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News of the Industry

Further Delay in Detroit

Jitney operators there made final move to secure review of order removing them from streets

FURTHER delay has been won by Detroit jitney operators in their fight against being ousted from the main thoroughfares of Detroit in accordance with a city ordinance, the validity of which has been upheld by the Michigan Supreme Court. The United States Supreme Court recently dismissed the appeal made by counsel for the jitney drivers' associations, stating that no federal question was involved. This action was popularly regarded as ending the jitney fight. The controversy was, however, reopened on Oct. 26 when the State Supreme Court granted Edward N. Barnard, counsel for the jitney drivers' associations, seven days' time in which to prepare a brief in support of a motion for rehearing on the case decided previously by that court in July, 1926. Mr. Barnard's brief has been filed with the court.

Jitneys Likely to Operate Until December

This action by the State Supreme Court will probably result in the jitneys operating unmolested on the streets of Detroit until some time in December. According to a statement by Corporation Counsel Charles P. O'Neil, it is possible for the court to get around to a decision within the next two or three weeks, and if it does the new move by the jitney drivers will not delay the banishing of the vehicles from the streets because it will take that long for the order of the Supreme Court to come down.

Mr. Barnard contends that the U. S. Supreme Court order merely held that there was no federal question involved. He further contended that the state court can reopen the case if it desires. In support of his motion, Mr. Barnard pleaded that the case is an unusual one in view of the public interest in the litigation and the importance that attaches to it. He submitted that the state court, in exercise of sound discretion and in order that justice may be served, should reopen the controversy. He cited certain alleged cases where such procedure had been followed "in the interest of substantial justice."

The motion for a rehearing was based upon the fact that while the U. S. Supreme Court recently denied the attempt to have the jitney ordinance declared class legislation and unconstitutional, the opinion stated that while the court lacked jurisdiction to act, sufficient evidence had been presented to make the matter one of which the State Supreme Court might take cognizance.

Mr. O'Neil, Corporation Counsel, stated that no new question had been raised by Mr. Barnard in his new motion and that everything he contends has already been decided by the court. Mr. Barnard and Mr. O'Neil have both signed a stipulation that there will be no oral arguments at the new hearing before the State Supreme Court. At the end of the seven-day period allowed for filing briefs the court will have adjourned its sessions, not to convene again until after Dec. 15.

Staten Island Municipal Trolleys to Be Sold

With the announcement on Nov. 16 that the city will sell at auction the 53 dilapidated trolley cars it formerly operated on Staten Island, the Walker administration prepared to write the final chapter in the story of the Hylan administration's Richmond enterprise. The trolleys are to be sold at auction in the Municipal Building on Dec. 5. When operation of the system was suspended last July most of the cars were literally falling apart. Service stopped when the Staten Island Edison Company refused to furnish power because the city had declined to pay bills already submitted. Meanwhile buses under private operation have replaced the cars. The railway system was taken over by the Hylan administration when the railway refused to operate any longer at a 5-cent fare. Included in the sale will be seven trackless trolleys.

Rapid Transit Moves in Chicago

New subway draft ready for consideration in Chicago as Aldermen return from subway study in Europe. Traction enabling bills advanced

PLANS for a comprehensive system of subways incorporating the best features of all other transit tubes and adequately providing for the downtown district at its maximum development were again brought to light in Chicago when a report based on recommendations made a year ago by the Citizens' Advisory Subway Commission was submitted to the City Council local transportation committee on Nov. 14 by Major R. F. Kelker, Jr., city engineer. A committee of Aldermen, armed with the new subway specifications, left Chicago on Nov. 16 for New York, where they will meet and discuss the draft with Michael J. Faherty, president of the Board of Local Improvements, who returned from Europe on Nov. 18 after completing a six weeks study of the subways of several foreign cities.

The latest project provides for a tube or "lower level street" under State Street, linking with the elevated lines on the north at North Avenue and with the south side branch of the "L" at Sixteenth Street. Between Randolph and Polk Streets, in and adjacent to the Loop district, there would be four tracks, with two tracks at the extremities of the line. Adjacent subway systems for both elevated and surface lines, it is proposed under the plan, are to be constructed after the completion of the State Street tube. Those for the elevated lines include underground tracks in Wells, Clark and Dearborn Streets running from Chicago Avenue, eight blocks north of the Loop, south through the Loop district to Polk Street and connecting with existing and projected main lines at either end. The Wells Street subway would connect with the north side and south side elevated lines, while the bore in Clark Street would connect at Chicago Avenue and Polk Street with projected northwest and southwest extensions of the present elevated system. The existing elevated loop, the structure of which now theoretically confines Chicago's downtown business district, would be eliminated and rapid transit trains now entering the Loop from the west side over the Metropolitan and Lake Street elevated structures would operate through subways under Van Buren Street, Wabash Avenue and Lake Street. These last-named tubes would be built on a different level to eliminate underground grade crossings with the north and south lines in Wells, Clark, Dearborn and State Streets.

Horseshoe Tubes for Surface Cars

The subways for the Surface Lines cars would consist of two horseshoe systems leading from the west side, under the Chicago River to the Loop and back again. A straight tube is planned from the Loop end of the present LaSalle Street tunnel under the river to an undetermined point south of the downtown district. The Washington and Van Buren Streets tunnels of the Chicago Surface Lines would be utilized for one of the horseshoe systems and two new tunnels under the river at Madison and Adams would be constructed for the other system.

The station platforms in the State Street subway, which it is proposed to build first, would be 520 ft. long and 18 ft. wide. They would be placed every two blocks in what is now the

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Loop district. Outside that area, they would be built at Roosevelt Road, Polk Street, Ohio Street, Chicago Avenue, Division Street and North Avenue.

Although the new plans follow in a general way the recommendations of the subway advisory commission, one outstanding difference is in the length of the proposed State Street tube. Major Kelker proposes that the system end at North Avenue and Sixteenth Street, which would make it eight blocks longer than the unit with terminals at Chicago Avenue and Roosevelt Road suggested by the commission.

Twice as many passengers as are now brought in and out of the Loop district by the elevated lines, or a total of 136,000 riders an hour, could be handled by the proposed systems, according to Major Kelker. They would have an aggregate capacity of 45 eight-car trains in each direction per hour. This would probably be adequate, the Major believes, for downtown development just twice that now existing.

Announcement of the new subway plans on Nov. 14 accompanied the news that the City Council transportation sub-committee had given final approval to four of the five traction enabling bills and formally recommended them to the full local transportation committee. One of these bills provides for the consolidation of elevated, street car and bus lines, another for a local regulatory commission, a third permits the city to issue indeterminate permits and the fourth for a fixed-term franchise for a period not to exceed 40 years. The committee's decision to set a limit of 40 years was reached early this week after objections had been raised to its original action in removing all time limits. Under the terms of bill No. 3, the city would have the option of granting an indeterminate permit or a 40-year franchise.

The fifth bill dealing with subways still is unfinished and was taken to New York by the aldermanic committee along with the Kelker subway draft, so that any ideas that may have been gathered in Europe by Mr. Faherty may be incorporated in the bill. Debate centering around a proposal to amend this bill to give the City Council instead of the Board of Local Improvements sole right to initiate construction is another factor which may indefinitely delay approval of the bill.

All but the subway bill are expected to be presented to the full committee on local transportation on Nov. 22. Should they receive the approval of the Aldermen at that time they are subsequently to be submitted to the railway companies for inspection. When all differences have been settled it is planned to ask Governor Small to call a special session of the Legislature so that the bills may be enacted into laws.

Contract Suggestions and Recommendations in Philadelphia

Expert Bibbins advises agreement for Broad Street operation only. Mayor asks Council for quick action. Dr. Snow advises $77,000,000 expenditure

MAYOR KENDRICK of Philadelphia on Nov. 10 submitted to City Council a form of agreement, prepared by J. Rowland Bibbins, for operation of the city-owned Broad Street subway by the Philadelphia Rapid Transit Company. The proposed agreement, together with a report by Mr. Bibbins and a message from Mayor Kendrick, was referred by City Council to its committee on transportation and public utilities.

According to Mr. Bibbins' plan, it seems, the Philadelphia Rapid Transit Company would become, not a lessee of the Broad Street subway, but rather, as it were, a city employee, whose compensation for operating the line would be 3 per cent of the net earnings, roughly $75,000 a year. It is also proposed in Mr. Bibbins' plan to limit the term of the agreement to about 8½ years, thereby making it coterminous with the Frankford elevated railway agreement.

The summary as incorporated in the report follows:

1. Recommended: An operating agreement on the contingent return plan; city high-speed lines to be operated by P.R.T. as part of a city-wide transit system with co-ordinated feeders and the same fares, interline transfers and exchanges.

2. City has assumed the full financial burden of providing new rapid transit, hence it should receive the net revenues from city lines to support its investment. Under existing circumstances this will yield maximum city return.

3. Capital, revenues and operating expenses of the city lines to be kept separate and under continuous supervision of an experienced board of control, with appropriate city and company participation. Supervision is essential to the success of the contingent return plan, as a safeguard to the city's interests.

4. Estimated Broad Street subway earnings under this agreement are about $2,500,000 net for 1929, first year of full operation, or about 2.8 per cent on the total cost, $89,000,000, leaving about the same amount to be paid, at the start, out of taxation.

5. Broad Street subway is strategically located on the city's main traffic artery. North Philadelphia already holds over half the city's population and is growing in population and housing more rapidly than any other district. Nearly 700,000 people, or two-thirds of this district population, live within the time-saving zone of influence of this subway and its feeder lines.

6. P.R.T. revenue has increased nearly $8,000,000, or 18 per cent, in the two years following the last fare raise, and total traffic in 1926 was the highest in the history of the company, also revenue traffic (excepting post-war peak year, 1920.)

7. Company is relieved of financial responsibility of building and operating city lines and, as the city's operator, receives compensation commensurate with the magnitude of such operations.

8. The trial term ends in 1936, the city then having right to review and termination; likewise every fourth year thereafter. Term of agreement ends 1957.

9. Extensions covered during the trial term relate only to those authorized by referendum, i.e., Broad Street terminals and Walnut-Darby lines; other desired extensions to be included by mutual agreement.

10. Recommended: Frankford elevated lease, under existing, practical conditions, may stand as it is, separate from the Broad Street agreement, but if by mutual agreement it can be made fully coterminous therewith, including right of review, this should be done so that some of its minor features may later be clarified. The non-standard track gage and size of cars and the physical connection with Market Street indicate the reasonableness of this course.

In a 450-page report filed at Harrisburg, Pa., on Nov. 15, following an exhaustive survey of the Philadelphia transit needs, Dr. F. Herbert Snow, chief engineer of the Public Service Commission, recommended the expenditure of $77,995,000 by that city to improve rapid transit facilities. Dr. Snow's investigation was begun in January.

Construction of a double-deck highway on Chestnut Street, one of the principal shopping thoroughfares, by building underground side passageways at a cost of $5,000,000 along the projected subway, was one of the engineer's recommendations. He suggested that this subway should be extended westward under the Schuylkill River to about 37th Street, and that surface railway lines should be placed underground on both Chestnut and Walnut Streets.

Addition of 100 cars to the Market Street - Frankford subways - elevated lines, construction of an underground pedestrian concourse around the City Hall, and elimination of parking in the center of the city were urged.

Strong Bid for Business by Akron-Cleveland Cars

On Nov. 1 the running time of interurban electric cars of the Northern Ohio Power & Light Company was reduced to an hour and a quarter between Akron and Cleveland. Just one hour and fifteen minutes from the Akron terminal to the downtown district—Ninth and Prospect—Cleveland. The company points out that under the crowded conditions of the highways between Akron and Cleveland it is practically impossible to make the trip by auto in that time.

Limited cars leave the Akron Terminal station hourly at ten minutes past the hour every day in the year. Most of the equipment in service is of the parlor car type. An appeal by the company to the public says:

You may read or smoke in comfort from one end of the journey to the other—and the trip costs but $1 each way.

The safe way to go—millions of miles operated without injury to a single passenger!

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Abandonment Impends

Threatening situation in Schuylkill County over wage and one-man car dispute. Company unable to meet obligations

RECEIVERS Shay and Evans have announced that they will operate the cars of the Schuykill Railway as soon as the men come back to run them; that unless public sentiment puts an end to the strike the trolley service will stop—not for a few weeks but for all time. In such language were the workers and the business people of Schuykill County advised of the present status of affairs in the cities of Pottsville, Frackville, Shenandoah, Girardville, Mahanoy City and Ashland, Pa., beginning with a wage dispute, leading to a walkout of the men on Oct. 1 and resulting, in the opinion of the receivers, in the probable cessation of service in the northern half of Schuylkill County.

Depression in the anthracite field, loss of traffic and resulting loss in revenue have played their parts in the financial and operating breakdown of the Schuylkill Railway, which was trying, it claimed, to pay a superfluous number of men an impossible wage. In 1924 an arbitration board awarded the trolley men an increase of from 55 cents an hour to 63 cents, a wage the receivers said did not take into consideration their ability to pay. The following year the revenue of the company dropped $100,000. When things began to look pretty somber the company asked the men to help by accepting a slight cut in their wages and to operate one-man cars. The men refused to consider these changes and voted to turn the request down flat. Later, after petitioning the Public Service Commission, permission was granted the company to abandon two-man operation and adopt one-man operation provided the cars were equipped with safety devices. Cars so equipped have passed inspection and have been approved by the commission's engineers.

The closing of the books for the six months ended June 30, 1927, showed that the company had failed to make operating expenses. Accordingly on Aug. 1 the company again gave notice to the men of its desire to amend its contract with them by cutting out the provision that all cars must be operated by two men and by establishing the Pottsville wage rate, which was 2 cents an hour less than that fixed by the arbitration board in 1924. The local countered by demanding an increase in wages from 63 cents to 70 cents and other concessions that meant more money.

Receivership quickly followed the company's default on its bond interest with an order to the receivers to operate the company for six months and report to the court whether the company could continue thereafter to give service to the people. Later a labor representative in conference with the company intimated the possibility that the men might concede the company's right to run one-man cars if a wage of 70 cents an hour were paid for that service. This proposal and that of arbitration the receivers were forced to reject.

The receivers state that they have reason to believe that those trolley men whose seniority will entitle them to the operation of the one-man cars opposed the strike and are willing to work on the Pottsville rate, but that they were outvoted by the junior men. They also think that if they can effect the desired economy of operating one-man cars at the same wage rate as prevails on other connected railway operations in the territory there is reasonable hope that under the protection of the court they will be able to "reinstate the company on a continuous operating basis."

Accomplishments in Kansas City Explained

Public opinion as expressed by the newspapers and business interests in Kansas City, Mo., seems to regard the changes in the organization of the Kansas City Public Service Company more favorably since the election of Kansas City men to the directorate. Sentiment was against the resignation of W. G. Woolfolk as president before the meeting held recently, there being some fear that the promises made to the public of the city while Mr. Woolfolk was in charge might not be carried out. The public seems reassured, however, by the brief statement issued by the board of directors after the recent meeting in which it was said that "it has been ordered by the board that budgets and plans for the 1928 improvement program be prepared by the officials of the company in collaboration with William G. Woolfolk's organization with a view to expediting the program as much as possible." The new board is to meet monthly, a new practice in the functioning of Kansas City railways.

Mr. Woolfolk, retiring president, announced that the company's officials, directors and owners could count on his co-operation and advice whenever asked. Mr. Newman, in a formal statement to the press, reiterated his viewpoint that the principal object of the railway was to give service, good service, to the public; the whole organization, from the employees up to the president and owners, is to make this its objective.

While the railway was committed to expend $6,600,000 by its franchise over a three-year period, the Woolfolk organization encompassed about $3,000,000 in new work in a year. About $1,250,000 went into almost 27 miles new track, $1,000,000 went into rehabilitation and modernization of street cars, coupled with the installation of one-man operating features, and $250,000 went into the rehabilitation of the Eighth Street tunnel, with a new approach, and the Mill Creek parkway viaduct.

For the "Eighty Per Cent"

WHEN the Philadelphia Rapid Transit Company, as it does in the circulars now being distributed, pleads for a square deal for the 80 per cent of the population using the street cars, the elevated and the subway trains, it is saying a word for "number one" at the same time. But the interests of rider and company are identical in this case, as the causes which work delay to the cars operate to the serious disadvantage of both. In pointing out in graphic form to the car riders the many reasons for the interruption of service that are wholly beyond the control of the P.R.T. management, the company is waging a useful educational campaign. It is human nature to "damn the transit company" when the cars are delayed or run in bunches or are desperately overcrowded. But at the same time it is only fair to remember that these delays affect the revenues of the company as well as cause inconvenience to the public and that it is to the company's interest to run its cars as regularly as possible. — *Philadelphia Public Ledger.*

Market Street Property Purchase Recommended

Purchase of the Market Street Railway lines by the city of San Francisco, Cal., for $20,000,000 is advocated in a voluminous report to the Board of Supervisors by Delos F. Wilcox. Purchase of the California Cable System for $1,000,000 also is recommended.

The report shows that if the railway declines the offer of the city it may be compelled, when franchises begin to expire at the end of 1929, to rip up tracks and repave scores of miles of city streets. Dr. Wilcox declares that the Market Street Railway at the present time is running about $650,000 a year short of a 7 per cent return on $26,000,000 on 47 lines. Only twelve lines and three cable lines are earning 7 per cent. Elimination of non-paying lines and drastic economies are necessary, he claims, in order to keep the basic fare at 5 cents, warning being given that the city must not be too confident of defraying the purchase cost out of earnings. Retention by the city of expert engineering advisers to study the consolidation problem also is urged.

In arriving at the $20,000,000 figure, Mr. Wilcox believes that the Market Street lines, as they exist today, have depreciated 30 per cent and the company's franchises are worth nothing to the city in money; also miles of present trackage should be scrapped and the repaving, in the event of purchase of the lines, should be done by the city. Assailing the suggestion of the company that some of its major franchises will not expire until 1932, Mr. Wilcox declares that the city should not contemplate competitive operation after 1929 on "fag ends of routes."

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Fare Innovations in Oakland

Commission order stresses need for rates to enable company to meet auto competition

MARKING a distinct innovation in the fixing of fares for an electric railway, the Railroad Commission of California on Nov. 11 issued an order to the Key System Transit Company to establish an experimental 5-cent basic fare in the East Bay district.

As indicated briefly in the ELECTRIC RAILWAY JOURNAL for Nov. 12 the fare plan provided for in this decision fixes a 5-cent ride at all times within a central area bounded approximately by 40th Street, Moss Avenue, Excelsior Boulevard, Chicago Avenue, Eighth Avenue and the Oakland waterfront. Also a 5-cent ride in the area lying between the central district and the county line on the north, San Leandro on the east and Alameda on the west is provided. The commission's order was issued as the result of a series of hearings conducted by Commissioner Clyde L. Seavey and investigation by the Engineering Department of the commission.

Perhaps the most unusual feature of the decision is the provision that during the off-peak hours between 9 a.m. and 4:30 p.m. a "bargain" 5-cent fare will be in effect between all points inside the larger area in which a 7-cent fare is now charged.

In order to give the regular rider the advantage of a low fare in the entire present 7-cent area, a weekly pass, good for an unlimited number of rides during the week in which it is sold, is ordered to be sold for $1. This weekly pass will be transferable and good for the use of the holder. The principle underlying this experiment recognizes the necessity of providing attractive rates by which the public is encouraged to make more use of street car transportation during off-peak hours and to enable the company better to meet the competition of the privately owned automobile.

The commission finds that one of the contributing factors to the decline of railway patronage is lack of comfort, which is combined with slow speeds and other similar features. It is expected that the company will take advantage of these experimental fares, combined with a program of distinct improvements in the service and an application of aggressive merchandising methods greatly to augment patronage.

The commission's engineers have estimated that the rates ordered will actually decrease the company's revenue nearly $400,000 a year as applied to the present riders, but they point out that if the reduced fares proposed will double off-peak patronage, the company can be placed upon a paying basis. The effect upon the existing riders is stated by the engineers to be as follows:

A reduction from 7 cents to 5 cents cash for 70 per cent of the riders, a reduction from 7 cents to less than 5 cents on the average for 18 per cent of the riders (this being the number that it is expected will make use of the weekly ticket) and an increase from 7 cents to 10 cents for 12 per cent of the long-haul riders using peak-hour facilities.

On transbay fares, the order provides for a reduction in the one-way fare to 20 cents and an increase in the monthly commutation ticket to $6. A new form of ticket is ordered to be sold at $5.50, good for weekday riders only.

As a basis for fixing the rates, the commission made a finding of value of the Key System Transit Company's properties of $29,101,063. This compares with the company's claimed value of $32,123,362.

The commission also found that the Key System Transit Company should have its net income increased approximately $1,000,000, holds to the opinion that nearly half of this additional amount can be obtained through operating economies.

Five-Cent Shuttle Line in Seattle

A 5-cent fare is scheduled to go into effect on the municipal railway system in the downtown district of Seattle, Wash. The City Council utilities committee approved the plan of D. W. Henderson, superintendent of railways, for operation of shuttle cars between Jackson Street and Virginia Street, on First, Second and Third Avenues, during the off-peak period each day, the hours between 9 a.m. and 4 p.m. The plan is to be tried for two months in the belief that it may induce people having short trips to make through the business district to use street cars instead of walking. The 5-cent fare will hold only on these shuttle cars, and will not entitle the passenger to a transfer. The cars will operate up First Avenue to Virginia and back on Second Avenue to Jackson and up Second Avenue to Pike Street and back on Third Avenue. The cars on which the 5-cent fare applies will be designated by special signs.

One of a Series of Ads with Strong Rider Appeal

We Can Save You Money Every Day!

YOUR automobile is a very desirable convenience to have. However, if you are driving it to the office every day, or to your shopping, at a cost of at least ten cents a mile, we can save money for you.

BY using the street car you can make the whole trip for a few cents. A weekly pass for $1.25 will permit you to ride the cars as often as you wish for a period of seven days. Five tokens may be purchased for 35 cents, and school tickets may be bought in strips of ten for 40 cents.

THIS little detail of saving a bit each day is the whole basis of thrift and the beginning of that independence we are all hoping to feel later in life.

WHEN you ride the street cars, you are practicing thrift in the most systematic way, because it insures you a DAILY SAVINGS for your bank account.

WE appreciate your patronage and again offer our service to save you money.

JACKSONVILLE TRACTION COMPANY
J. P. INGLE, Manager

A promise from Jacksonville

Litigation in Seattle Ended

Handing down two decisions, Judge Frank S. Dietrich of the United States Circuit Court of Appeals on Nov. 11 dismissed litigation involving the Seattle Municipal Railway system, Seattle, Wash. Both suits, in which the city of Seattle appeared as the defendant, were the outgrowth of the situation which developed last January when the Seattle railway system went on a warrant paying basis and funds were transferred to New York to meet bond obligations.

In the first suit, that brought by the Puget Sound Power & Light Company against the city of Seattle, the "specific performance" case was dismissed when Judge Dietrich sustained the motion of the city. In dismissing the action, Judge Dietrich declared that there was "no averment that the city is wasting or mismanaging the railway property or applying or threatening to apply any of the gross revenues of the system to any purpose other than payment of outstanding bonds and operation and maintenance." John G. Von Herberg, who had appeared in the suit, had contended that the expenses of operation and maintenance of the system had a prior lien on all gross revenues. This contention was not sustained.

Judge Dietrich at the same time refused to take heed of the demand of the Puget Sound Power & Light Company that it lay down a specific rule whereby the city should every day set aside a certain portion of the receipts to meet the bond requirement. If the city has the right, the court held, it also has the right to set aside the necessary funds in a lump sum. "The court cannot attempt to impose a specific rule," it held. This action was dismissed with prejudice.

The second case, that of John G. Von Herberg against the city of Seattle, is one in which the Puget Sound company was made a cross-defendant along with Mr. Von Herberg. This suit was started by Mr. Von Herberg in the state court to enjoin the city from transferring funds to New York until after it had paid outstanding warrants for operation expenses. The case was removed to the federal court. Attorneys for Mr. Von Herberg sought to have it returned to the state court for trial. A motion for dismissal made by the Puget Sound Power Company and the city was sustained.

Route Changes in Pine Bluff

During these autumn months rerouting has been in force on the lines of the Arkansas Power & Light Company in Pine Bluff, Ark. The changes will make it unnecessary for passengers to embark and disembark in an unprotected zone and will enable the company to give more satisfactory service. This it is trying to do, as evidenced by its motto, "Helping Build Arkansas."

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Cleveland Appears to Face Fare Increase

An increase in fares to 8 cents appears to be presaged by the announcement of Paul E. Wilson, vice-president of the Cleveland Railway, Cleveland, Ohio, that an unprecedented drop in October car riding was expected to throw the company's interest fund below $500,000. Dropping of the interest fund, or fare barometer, below the $500,000 mark is *prima facie* evidence, Mr. Wilson said, that a fare increase is needed.

Figures on the company's income for September will be released at the monthly board of directors' meeting and will show according to Mr. Wilson, that the interest fund was still above the $500,000 mark at the end of that month, although it decreased from $540-,000 during September.

The usual fall increase in passengers, however, has failed to materialize so far, Mr. Wilson said, and indications are that October will be no better from a financial standpoint than the preceding month. He is reported to have said:

While the fact that the interest fund drops below $500,000 is evidence "on its face" that a fare increase is needed, it is not any assurance that a raise will be made. The trend of car riding may be in an upward direction before long, in which case fare might not be raised.

Is Lord Ashfield Spoofing Big Bill?

A London dispatch says that despite the anti-British sentiment of Mayor Thompson of Chicago, Lord Ashfield, head of the London Underground system, has accepted the invitation to attend the opening of Chicago's subways and will be among the guests to make the first official trip through the system.

Cheap Sunday Rides in San Francisco

A new bargain in the form of a 24-hour ride on Sundays for 20 cents is being offered by the Market Street Railway, San Francisco, Cal., on its city lines. Tickets will be accepted in lieu of nickels on most all car lines.

Transport Survey in Grand Rapids Shopping District

To determine the actual number of downtown store patrons who are using the automobile in Grand Rapids, Mich., as a means of transportation to the loop or business district, James Sinke, Director of Public Safety, and the Grand Rapids Association of Commerce, with the co-operation of sixteen of the leading stores, started a survey on Nov. 14, with Miss Inez Miller of the Association of Commerce in charge. This is the first survey of the character to be made in Grand Rapids since the traffic congestion caused by autos has become acute and is expected to result in the electric railway receiving more consideration in dealing with traffic issues and conditions, where heretofore attention has practically been centered wholly in meeting the needs of the autos.

Every service to shoppers in the business district is represented, so the survey will not only be far reaching, but it is hoped convincing. In each of the stores represented employees specially designated will have charge of the ballot boxes and ballots, counting these ballots hourly and totaling them daily for a period of one week during the campaign. Customers to the stores will be asked to designate by their ballots how they came to the store, by auto, taxi, by street car or on foot.

Convincing Proof that "It's Great to Be a Georgian"

Impressive, indeed, is the 1927-1928 year book of the Georgia Power Company, Atlanta, Ga., presented as the company says, "to tell briefly the story of the company, and also to furnish information about the state's agricultural, industrial, educational, climatic and other advantages."

This is too modest a statement by far. The booklet, one of 54 pages, is beautifully done in colors. Many of the reproductions, especially that of the Blue Ridge scene at Lake Tugalo, deserve a permanent place in the library of the collector of prints.

The subjects covered by the contents are listed in the following order: History, hydro-electric properties, interconnecting power system, other properties, industrial map of Georgia, territory served, recent improvements, Georgia's resources, labor, education and recreation, and the new South.

The Georgia Power Company, operating company for the Georgia properties of the Southeastern Power & Light Company, really is a recent enterprise. Included in the group consolidated to form the new company were the Athens Railway & Electric Company, Georgia Railway & Electric Company, Georgia Railway & Power Company, East Georgia Power Company, Rome Railway & Light Company and the constituent Georgia Power Company, the last named including properties formerly belonging to the Athens Gas, Light & Fuel Company, Georgia Southern Power Company, Georgia Utilities Company, and Milledgeville Lighting Company.

The story of the new company's constituent properties is a history of three-quarters of a century of progress in rendering public utility service, including railway service, to Georgia, which has reached a new peak in the formation of the Georgia Power Company.

As a handbook the new volume would appear to be indispensable to editors and others interested in having at their command a source book of reliable information. Moreover, the publication carries conviction that the phrase is well deserved which proclaims: "It's Great to Be a Georgian."

Closer Co-operation of Steam and Electrics Urged

The Indiana State Chamber of Commerce, following a meeting of the traffic managers of 60 of Indiana's largest factories recently, issued a statement in which the chamber advocates more physical connections between the electric and the steam roads of Indiana. John E. Frederick, Kokomo, president of the state chamber and a big shipper, said the interchange of freight not only would aid the electric lines, but, with a lower freight rate, would bring new industries to the state, thereby providing the railroads with increased business in Indiana. He said:

Unfortunately in most instances the electric lines paralleled the steam roads and for a time thrived on the passenger end of the business, which in the beginning was the sole source of revenue. With advent of the automobile and bus, the passenger business for the most part has been diverted to these other two agencies. Prepared only for short hauls, little attention was paid to the revenues that might be derived from freight.

The freight and traffic committee was asked to pass upon exhibits that will be offered before the Interstate Commerce Commission in the Western class rate case by the chamber. The case, as viewed by Indiana shippers, is one of the most important of the year.

Extension of One-Man Car Service in Memphis

One-man cars are now operated on all Memphis, Tenn., lines, with the exception of the Wellington Street line, it is announced by the Memphis Street Railway. The cars have been installed gradually so that the elaboration of the service has made it unnecessary to curtail the force of trainmen in the employ of the company.

Advertising Campaign in Portland

For the past six weeks the Portland Electric Power Company, Portland, Ore., has been reaching its patrons through an educational and good will advertising campaign conducted in the newspapers and displayed in all cars. The messages tell the safety record of the company and give some of the operating statistics. Other ads discuss parking, the private car and the bus service supplied by the railway. Still others stress the service slogan of the employees.

The layouts of the advertisements are striking and their messages appealing. This advertising is definitely tied around the celebration of the past twenty years of service of the Portland Electric Power Company. Copy appears once a week, alternating in Portland's four principal dailies, thus getting the company on the map four times every seven days and reaching thereby every one who reads a newspaper.

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Detroit Traffic Survey Presented

Detroit has the traffic survey for which the city paid $30,000 or more. The engineering force operating under Arthur T. Waterfall, third deputy police commissioner in charge of traffic, has completed its study and submitted its findings to the Common Council. Numerous suggestions have been made to improve the present congestion. Some of these have been placed in effect. The express service on Jefferson Avenue is one of the suggestions made by the engineers.

The proper use of alleys for traffic, illumination, street widening, right and left turns, one-way traffic and a number of other important subjects are fully covered by the report and suggestions. All of those subjects directly affect taxes and the accessibility of places of business throughout the city and in consequence, says the *Detroiter*, published by the Detroit Board of Commerce, the business men are deeply interested in what use will be made of the report, "now that we have it."

A committee of the Detroit Automobile Club, the appropriate body to assume the task, has taken up a study of the report. Acknowledging this committee's leadership in this effort the Board of Commerce is firmly in support of its work and stands prepared to cooperate to the utmost.

Relieving Traffic in Salt Lake City

The Utah Light & Traction Company, Salt Lake City, Utah, has installed the system of double berthing, double loading and double dispatching its cars at each intersection on Main and State Streets, between Fifth South and South Temple Streets. This eliminates the old plan of one car at a time being loaded at intersections. By loading two cars at a time it has also done much to speed up auto traffic through the city. Police officials and officers of the railway declare that this is the biggest single move to relieve Salt Lake City's congestion that has been made for a number of years.

Houston Parades Old and New Equipment

In a gala parade through the city streets the various stages of advancement made by the Houston Electric Company, Houston, Tex., were shown on the occasion of the arrival of twenty new street cars and two new buses. A reconstructed mule car led the procession, followed by dinky cars and other models which came into use as improvements were made in street car construction, and finally ten of the new cars, which represent the last word in electric railway equipment.

The twenty new street cars, in connection with the two new buses, represent an outlay of about $380,000 and constitute the first move of the Houston Electric Company in rehabilitating its equipment, as outlined by the management last spring following the readjustment of fares. Plans and specifications of these cars are shown on page 969 of this issue.

Baltimore Fare Hearings to Be Resumed

Hearings on the application of the United Railways & Electric Company, Baltimore, for authority to increase the fare from 7½ to 10 cents will be resumed by the Maryland Public Service Commission on Nov. 21. The hearing was to have been resumed on Nov. 15, but there was delay in the preparation of exhibits. The United has completed its evidence.

Electrification Report Denied

Reports originating in Wall Street that the Pennsylvania Railroad had completed plans for the electrification of its lines between Pittsburgh and Altoona have been denied by President W. W. Atterbury. He said:

> There is no truth whatever in the report. We have no such plans under consideration.

Press dispatches from Pittsburgh had made it appear that plans for electrification of the Pennsylvania Railroad between Pittsburgh and Altoona had been completed and that inquiries for electrical equipment had been given to leading electrical manufacturers. It was said 650 locomotives would be required. The report that has now been denied said:

> Heavy grades over this section have always been a serious operating problem which makes electrification advisable. Engineers have been studying the project for more than a year.

Free Rides in Logansport

"Keep Your Fares" was the slogan of conductors of the Indiana Service Corporation in Logansport, Ind., when the Wiler & Wise store leased the entire car service from 8 o'clock to 10 on the morning of Nov. 2. The public was invited to ride the cars free so that all might attend the Wiler & Wise anniversary sale and so that people would not have the burden of parking their cars. The cars carried signs advising the public of the plan and also advertising the Wiler & Wise sale.

Weekly Passes Proposed for Halifax

The application of the Nova Scotia Tramways & Power Company, Halifax, to the Board of Public Utilities to do away with the monthly permit system, under which a passenger, for $1, pays 5 cents per ride for a month and to substitute therefore a weekly pass system whereby the payment of $1.50 would entitle the holder to ride as often as he likes that week without further payments, is before the Utilities Board.

Hocker Line Receives Help

That real progress in the reorganization and rehabilitation of the Hocker interurban line, serving the Merriam-Shawnee suburban district, is being made was indicated on Nov. 9 when Herman Sonken asked Powell C. Groner, president of the Kansas City Public Service Company, to leave rolling stock to the road. Mr. Groner assured Mr. Sonken that the Kansas City Public Service Company would co-operate in every way and agreed to lease cars to the suburban line.

Mr. Sonken of Sonken & Galamba purchased the Kansas City, Lawrence & Topeka Electric Railroad at a receiver's sale for $20,000. Since the sale, former patrons of the line have realized its value. Now W. K. Paul, former general manager of the line, is attempting to finance its rehabilitation by floating a $65,000 municipal aid bond issue for the road.

Mr. Sonken said his firm would wait for its $20,000 until the road was able to earn money and pay it. The committee that is seeking to restore service over the road has an engineer at work surveying possible freight business.

Franchises to Be Offered for Sale in Richmond, Cal.

Three electric railway franchises which were applied for by the Key System Transit Company, Oakland, Cal., for operation in Richmond will be advertised for sale and let to the highest bidder on the night of Nov. 28. The franchises are to run for a period of 50 years.

Appearance Appeal in Washington

To compete with the brilliant colors with which automobiles are now being adorned the Washington Railway & Electric Company, Washington, D. C., has decided on some material changes regarding its own color scheme. As an experiment, a two-man car operated on the line of densest traffic has been decked out in dark red and cream as a departure from the standard "Pullman" green.

The red has been used on the side panels below the belt rail and the cream above the belt rail, creating a streamline appearance, while on the interior the ceiling and dash have been white enameled. This car has been operated only a short time in its new colors, but it has attracted much attention and a score or more letters have been received complimenting the company on the idea.

The company is now considering whether it would not enhance the attractiveness of the cars and assist in identifying the various lines to use different color schemes on the different routes. A start already has been made in this direction by varying the colors of one-man cars. These present an attractive appearance with a dark blue base and cream upper structure. The buses are also arrayed in cream and blue.

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Recent Bus Developments

Express Experiment in Detroit to Be Applied Liberally

A tentative plan for extending the express system to make it general for the principal lines of the Detroit Department of Street Railways has been announced by Del A. Smith, general manager of the department. The proposed plan provides for using the present car and bus equipment with additions instead of substitutes. The general manager, the announcement states, believes that the program, if adopted, will help to solve Detroit's transportation needs. It is estimated that the expenditure of $6,000,000 devoted mostly to building new tracks, would provide a means of taking care of a population of 4,000,000.

It is cited that the existing express service on Jefferson Avenue shows what can be done on other lines. Referring to the newly inaugurated express service on Jefferson Avenue, Mr. Smith pointed out that the department's buses take care of local passengers. This enables the street cars to increase their running speed to 18 m.p.h. Thus in making the express service general throughout the city, Detroit could approximate rapid transit on the surface and avoid the expense of building elevateds or subways.

The plan would do away with the necessity of patrons on the express lines walking one or two blocks to the nearest street car stop. The buses operated in conjunction with express cars as they are now operated on Jefferson Avenue would pick up passengers at the first corner. The announcement states that the new plan could be fully installed within three or four years to include bus service and express service on twenty or more lines, covering such main arteries as Woodward Avenue, Grand River Avenue, Gratiot Avenue, Fort Street, Mack Avenue and the crosstown lines. The present routes in most cases would be extended to the city limits.

Express service is to be started on Grand River Avenue within the next month or six weeks. The Grand River line is a part of the former Jefferson-Grand River line, which was divided when express service was started on Jefferson Avenue.

Richmond-Seven Pines Line Seeks Permit

The Sandston Electric Railway has applied to the Virginia State Corporation Commission for permission to operate buses between Richmond and Seven Pines, via Williamsburg Road. The case was set to be heard on Nov. 16, but the taking of testimony has been postponed until Jan. 17. The application is opposed by the Virginia Electric & Power Company and the Peninsula Transit Corporation, both of which operate transportation lines along the Williamsburg Road.

A similar petition was filed with the commission last winter by the Sandston company, but was finally withdrawn by the applicant on March 2, 1927. The Sandston company wants to operate a bus line connecting with its electric line at Seven Pines. No charge is to be made for transfers from the electric cars to buses, and vice versa. Oliver J. Sands, president of the American National Bank & Trust Company, Richmond, is president of the railway.

No Authority to Regulate Springfield, Mo., Buses

The application of the Springfield Traction Company for an increase in rates for buses operated in Springfield, Mo., was dismissed by the Missouri Public Service Commission on Nov. 4, on the grounds that the state commission was without authority to regulate the rates of bus companies operated within a municipality. Buses are used to supplement electric railway service.

The ruling has been interpreted to mean that St. Louis will have exclusive jurisdiction over the rates, service and routes of the People's Motorbus Company and the St. Louis Bus Company, an auxiliary of the United Railways. The state commission did claim exclusive jurisdiction over bus lines using state highways which merely have terminals or a minor part of their routes within a city.

Bus Substitution Between Moline and Davenport

In a permit just granted by the United States government a motor coach service operating across Rock Island Arsenal between Moline and Davenport will be substituted for the present arsenal stub car line. The new service, to be installed by the Tri-City Railway, will go into effect about Dec. 1, when the equipment, now being built, will be ready for delivery.

Under the new arrangement special fares have been established. The present tripper service by railway in the morning and noon hours on Saturday and in the morning and evening hours on other weekdays to serve arsenal workmen will be continued as at present with no change in fare rates. All track connections and facilities will be kept in serviceable condition so that at any future time when the work at the arsenal requires, additional rail service can be introduced as considered necessary by arsenal authorities.

It is stipulated in the permit issued by the federal authorities that the service shall be in accordance with rules and regulations established by the commanding officer and that coaches and equipment be subject to his inspection at all times.

Hearing on New York Bus Petition Nov. 22

Discussion of the financial plans of the Equitable Coach Company, New York City, was renewed after it was announced at a Transit Commission hearing on Nov. 11, with Commissioner Leon G. Godley presiding, that Godfrey Goldmark had withdrawn as counsel for the company. Charles M. Travis, representing the company, obtained an adjournment of the hearing until Nov. 22 to permit new counsel for the company to study the case.

The Equitable Coach Company has an application pending before the Transit Commission to operate buses in all New York City boroughs except the Bronx.

J. H. Pardee, president of the Equitable Coach Company, Inc., made the following statement on Nov. 16:

We wish to take this opportunity to deny emphatically that the Equitable Coach Company, Inc., has had or contemplates having any negotiations with B.-M. T. interests relative to the selling of the Equitable Coach Company, Inc., as was reported in the morning papers. The Equitable Coach Company, Inc., wishes to reassure the people of New York City that they are steadily going forward with their plans looking toward giving the most modern and up-to-date motor coach service in the world and not a minute is being lost in the perfecting and carrying out of these plans, notwithstanding the many obstacles being placed in our way.

The Tompkins Bus Corporation, which obtained a franchise to operate buses on Staten Island from the Board of Estimate last summer, and which now is seeking a certificate of convenience and necessity from the Transit Commission, will be required to furnish detailed information on the company's financial standing at the next hearing before the Transit Commission on Nov. 25.

Reprint from "Bus Transportation"

"Maintenance Costs and Accidents Reduced by Training of Drivers" is the title of an eight-page pamphlet reprinted by the Northern Ohio Power & Light Company, Akron, Ohio, from the October issue of *Bus Transportation*, one of the McGraw-Hill publications. The article discussed the results accomplished by the schools for operators maintained by the Northern Ohio Power & Light Company.

Talk of City Run Bus Lines in St. Paul

The St. Paul City Railway, St. Paul, Minn., a part of the Twin City Rapid Transit system, appears to be threatened with competition by a city-operated bus line. The earnings in St. Paul are reported to have been inadequate in recent years and the company has made an application for increased fares in St. Paul, but not in Minneapolis. Now follows the bus prospect. City Attorney A. A. Stewart has ruled that the city

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has the right to operate bus lines if it so desires. He said:

The transportation system has reached the stage where it seems to me that the city must soon give serious consideration to the question of municipal ownership of transportation facilities. We are now confronted with a complete monopoly of all forms of transportation. The city has lost practically all control of any transportation facilities serving its people. . . . I don't think the city should attempt to acquire the electric railway line or the existing bus lines. It is quite evident that the people now demand bus transportation. In my opinion that transportation should be furnished by the city itself.

Commissioner H. C. Wenzel also is in favor of city buses.

Protest Filed Against Bus Out of Kansas City

The Kansas City Public Service Company filed a protest in Jefferson City on Nov. 3 against the issuance of a certificate of convenience and necessity authorizing the White Line Bus Lines, operating between Lexington and Kansas City, to handle local traffic between Independence and Kansas City. It alleged that its 21-hour daily service was adequate and that competition from the bus company would be "unnecessary and destructive."

Rules in Maryland Under Consideration

A new list of rules and regulations covering the operation of buses in Baltimore and all other sections of Maryland is under consideration by the Maryland Public Service Commission. The subject was taken up at an informal hearing held by the commission on Nov. 9, at which the representatives of about twenty companies, including the United Railways & Electric Company, Baltimore, were present.

The commission, through its chief engineer, H. Carl Wolf, and its transportation engineer, Joseph L. Wickes, had prepared a new set of rules, which made numerous changes in those in effect, and it was on these that the hearing was held. Many of the rules prepared by the commission were acceptable to those interested, but there were a few which brought about lively discussion.

One of the proposed rules which met the greatest opposition would require all companies to make weekly reports in detail to the commission. These reports would have to show the complete daily record of each bus. Representatives of the United said a clerical force would be required to keep the record in such detail and urged the commission to modify the measure so as to make it less onerous. Others wanted the reports to be made less frequently. It is expected that out of the suggestions submitted at the adjourned hearing on Dec. 1 the commission may accept some modifications for inclusion in a revised code.

Financial *and* Corporate

No Successor Yet to J. J. Mitchell, Chicago Railways Receiver

Federal Judge James H. Wilkerson has taken under advisement a motion by attorneys representing interests in the Chicago Railways foreclosure litigation to permit Frederick H. Rawson and Henry A. Blair to continue as receivers without the appointment of another receiver to take the place of the late John J. Mitchell.

The motion, officially notifying the court of the death of Mr. Mitchell, and asking for the continuance in office of the two other receivers, was made by Attorney James M. Sheean on behalf of the receivers, and was concurred in by Attorneys Horace Kent Kenney and E. H. Cassels, representing the mortgagors.

Assignment Clause Inserted in Miami Agreement

The City Commission at Miami, Fla., has authorized the insertion of a clause in the agreement with the Miami Beach Railway which will allow assignment of the agreement to a third party. The clause specifies that the holder will be bound by the present contract and that the Miami Beach Railway is not relieved of any responsibility under the assignment. Joe H. Gill, vice-president of the Florida Power & Light Company, of which the railway company is a subsidiary, explained that all other contracts and franchises with the city had an assignment clause. Mr. Gill said that discrepancy in the present contract was found when negotiations were opened recently in New York for financing.

Southern Cities Properties Described

A booklet has just been issued descriptive of some of the properties of the Southern Cities Utilities Company. These properties supply electric light and power service in Tennessee, Alabama and West Virginia, water service in Tennessee, electric railway and bus service in West Virginia, bus service in North Carolina and gas service in southern New Jersey and Manila, P. I. The system also includes an ice company and a wholesale supply company operating in Tennessee. Since the booklet was printed the Citizens Gas Company, serving in and near Salisbury, Md., has been acquired by the Southern Cities Utilities Company. Negotiations now are in progress for the acquisition of a number of other public utilities. The principal officers of the Southern Cities Utilities Company, elected at a recent meeting, are: President, Walter Whetstone; vice-president, B. F. Pickard; secretary and treasurer, Henry W. LeBoutillier. They will serve in the same capacities for the various affiliated and subsidiary companies. The principal office of the company is located at 1612 Market Street, Philadelphia.

Foreclosure Sought on Michigan Property

Suit has been filed in the United States District Court by the Harris Trust & Savings Bank, Chicago, to foreclose on $536,000 bonds of the Southern Michigan Railway, in Grand Rapids, Mich., formerly the South Bend & Southern Michigan Railway. The Southern Michigan Railway is controlled by the Chicago, South Bend & Northern Indiana Railway.

The plaintiff asks that an accounting be made of all property, interest on the bonds from April 1, 1927, payment for services and appointment of a receiver. It especially petitions the court for an injunction enjoining officers of the railway from disposing of any of the property. The bank also asks that a trust deed be declared a valid lien and in case of failure to meet the obligation the court permit the sale of the entire property in a single parcel.

Financing by Common Stock Important

The Railroad Commission of California has denied without prejudice the application of the Los Angeles County Water Works for permission to transfer its properties to the Gardena Valley Water Company and the application of the Gardena Valley Water Company for permission to issue $125,000 of 6½ per cent twenty-year bonds at 94 and $30,000 of 7 per cent preferred stock at par and $85,000 of common stock. The commission, after reviewing the capitalization and indebtedness of the Los Angeles County Water Works, concludes that that company should be refinanced, but on a different basis than that proposed by the Gardena Valley Water Company. Among other things the commission said:

Too much emphasis is being placed on the number of times the net earnings of a property may exceed bond interest or dividends on preferred stock. It is just as important, if not more so, to capitalize a property so that it can show reasonable earnings on common stock. The records of the commission show conclusively that companies which have been able to obtain some of their construction funds from the sale of common stock have been able to sell readily bonds or preferred stock and furnish more satisfactory service.

It should also be remembered that we are not concerned here with a property to be constructed but with a property which

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has been in operation for years and that the rates of the Los Angeles County Water Works have only been recently determined by the commission. It is our conclusion that the capitalization of the properties in question should bear some relation to their earnings as well as the cost or the value thereof, and that a form of capitalization which on its face seems to preclude the raising of some of the construction funds through the issue of common stock is not in the public interest and therefore should not be authorized by this commission.

$89,539 Increase in Gross Income in Kansas City

An increase of $89,539 in gross income is shown in the report of the Public Service Company of Kansas City, Mo., for the first nine months of this year, despite the fact that operating revenue fell $337,768 behind that for the corresponding period last year. Total operating revenue for the first nine months of this year is reported at $6,973,653, compared with $7,311,421 for the similar period in 1926. Operating expenses for the first nine months this year were $5,386,462, compared with $5,842,290 last year. Taxes increased from $388,350 last year to $419,500 this year.

The report states that between Oct. 15, 1926, and Sept. 30, 1927, the property earned a total income of $829,993 applicable to dividends on the preferred and common stocks of the company.

Authorized expenditures of $3,783,412 to September 30 for rehabilitation were shown; of this amount $2,776,610 has been expended. The company must spend $6,600,000 in the first three years of ownership in rehabilitation, under the terms of its new franchise.

Five hundred and ninety-two of the company's 746 street cars are destined for "one-man" operation. In explaining the change from two-man to one-man cars, the report pointed out that as a result of the change, 18 per cent more cars will pass each corner every hour. Business has increased as much as 6 per cent on some "one-man" lines.

Receivers Named for Des Moines City Railway

Company defaults in payment of principal on $700,000 of debentures issued five years ago. No changes in service or fares contemplated

C L. HERRING, prominent Des Moines business man and Democratic national committeeman from Iowa, and F. C. Chambers, president of the Des Moines City Railway, Des Moines, Iowa, were named receivers for the Des Moines City Railway by Federal District Judge Martin J. Wade.

The order of the court was issued on application of the Harris Trust & Savings Bank, Chicago, trustee for the holders of $700,000 of 7 per cent five-year gold debentures upon which payment of principal is in default. No hearing on the application was necessary, as the company acknowledged the validity of the claim of the bondholders, and gave notice that it would not contest the action.

Details Revealed in Petition

In addition to the receivership, the petitioners also asked that the property of the railway be sold to satisfy the claim of the security holders and that a writ of injunction be issued to prevent any general creditor from interfering with the operation of the property by seeking an attachment or by attempting to levy on the company's holdings.

Judge Wade granted the prayer of the bondholders in an order signed at his home in Iowa City. It dealt only with the appointment of the receivers. He is expected to submit another order soon taking up in detail the points involved in the operation of the property pending possible sale of the system.

The petition goes into detail in setting forth the grounds for action, the inability of the company to retire the debentures, and the desire of the plaintiffs that the railway property be kept intact in order to conserve the best interests of the public and the creditors.

The $700,000 of debenture bonds were issued in March, 1922, at the time of the termination of a former receivership, and as a necessary step in the restoration of the company's property to its owners. Under the order of the federal court, the company used the funds thus acquired to liquidate a deficit of nearly $600,000 which had piled up during the seventy-five days in the summer of 1921, when service was suspended. This debt was to be amortized by monthly payments from revenues of the company. After a total of $82,000 had been paid on the principal sum, the railway found revenues inadequate, and April 1, 1927, the entire remaining principal became due and was defaulted.

The debentures are junior to $4,651,000 of outstanding first mortgage bonds of the railway. As there has been no default in payment of the first mortgage bonds, the holders are not a party to the receivership action. Any sale of the property of the Des Moines company will be made subject to the first mortgage bonds.

In support of its allegation that the Des Moines City Railway will be unable in the future to satisfy the claim of the debenture bondholders, the petitioners cite the Aug. 1, last, report of the company. This shows that estimated revenues for 1927 will total $2,223,087.84 (based on figures for the first eight months of the year) and that total operating expenses and taxes will aggregate $1,934,931. Adding bond interest of $241,050 to operating expenses and taxes, the petitioners point out, will practically wipe out the net revenue, leaving only $47,106, a sum declared to be wholly inadequate to meet the company's obligations.

Some Fare Facts

This statement receives added weight by figures taken from the monthly report of the company since Oct. 1, 1925, when a 10-cent fare was adopted and children's fares were raised from 2½ cents to 5 cents, with the expectation that the ensuing revenues would be sufficient to yield an adequate return. The experiment started off with indications of success. A deficit of $73,254 in the stabilizing fund was wiped out, and operating profits were registered monthly from October, 1925, to and including May, 1926. However, the automobile aided by poor economic conditions and lack of work in the building trades, made such inroads on railway revenues that in only two months of the past sixteen have credit balances been shown, while monthly operating deficits have run as high as $27,316—the figure registered in September this year. A court decision adverse to it prevented the company from taking full advantage of the economies of one-man operation.

On June 6, 1926, the company adopted a 25-cent Sunday pass good for unlimited riding throughout the day and until 12 midnight. On Sept. 20, 1926, a weekly pass was instituted, selling at $1.25 and good for unrestricted riding for seven days. The weekly pass, which has largely superseded the Sunday pass, has reached a sale of as high as 12,000 a week, and records show it is giving the regular car patron practically a 5-cent fare. The average number of rides by pass holders is slightly more than twenty-six a week. It is generally agreed that the pass has created much good will for the company.

The value of the city railway's property is estimated at approximately $10,000,000. It was appraised at that figure in 1919, and a year later a special appraisal made by the city reduced that figure less than 5 per cent.

The receivers have announced that they will make no changes in service or fares. They are pledged, of course, to conserve the property in the interests of the public and the creditors, pending disposal of the system by the court.

Abandonment Hearing on Dec. 13

Hearing of the application of the Key System Transit Company, Oakland, Cal., for permission to abandon certain local lines in Richmond has been put over by the State Railroad Commission for Dec. 13. In view of the recent agreement reached by the city and the Key System permitting abandonment of the line to Alvarado Park, north of Macdonald Avenue, the hearing is expected to be merely a formality.

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Boston & Maine Computes Costs

The Boston & Maine Railroad has made a careful study to determine the proportional cost of operating steam passenger trains, gasoline cars on rails and buses on highways. It reports that it costs $1.58 per mile to operate the train, 72 cents per mile to operate the gasoline rail cars and 28.9 cents per mile to run the motor coach. In this computation the cost of rail maintenance is not included. The gasoline rail car cuts the steam costs in half, and five motor coaches can be operated over the highway for what it costs to run one train the same distance.

The Boston & Maine has now 68 buses operating 1,000 route-miles and 40,000 total bus-miles daily, and 24 gasoline rail cars operating a total of 2,700 miles a day. It is out of these actual operations that the figures of comparable items have been developed.

The table summarizing the Boston and Maine's cost experience in direct and other comparable costs follows:

COST PER TRAIN-MILE (CENTS)

	Steam	Rail Motor Car	Bus
Wages	38.7	23.40	4.574
Fuel	23.7	10.77	3.343
Repairs	50.8	8.33	5.359
Miscellaneous	16.6	1.17	7.171
Depreciation, insurance and interest	16.5	15.88	7.243
Taxes and fees	12.6	12.60	1.265
Total	158.9	72.15	28.955

Under "Miscellaneous" are included in the case of steam trains, supplies, hostling and other engine-house and train expenses not otherwise shown. Under gasoline rail cars similar supply items, heating, lighting, cleaning and hostling, and under buses garage expenses, lighting, tickets agents and snow removal are represented. Depreciation of steam trains is charged at a rate of 2 per cent on the investment on cars, and 3 per cent on the investment on locomotives; on gasoline rail cars 5 per cent on the investment in cars and 12½ per cent on the motor, and in buses at a rate of 20 per cent.

Petition Filed for Abandonment in Mobile

The Mobile Light & Railroad Company, Mobile, Ala., has appealed to the Public Service Commission for permission to abandon its tracks on portions of Augusta, Chatham and Texas Streets. The company told the commission the cost of rebuilding its tracks on the streets which will be paved will be $44,925 and the cost of paving will be $16,559, a total of $61,485. It also said the service on the streets does not yield a return and that its franchise will expire Jan. 15, 1936. It said it would not care to renew the franchise for operation on the streets because of the losses it is now said to be suffering.

In its petition the railway set forth figures regarding its earning capacity. On its valuation of $3,765,369, which was set by the Public Service Commission, it earned $69,947 or 4.47 per cent in 1926 and during the first nine months of 1927 it earned $15,964 or 2.22 on its valuation.

Surplus Continues to Improve on Interstate Lines

The operation of the railway department of the Interstate Public Service Company, Indianapolis, Ind., showed material improvement in 1926 over the preceding year. The total gross business increased $66,444, while the net from operation showed an increase of $120,114. The bus service, both through and local, to points between Indianapolis and Seymour, continued in satisfactory operation. These facts were contained in the annual report to the stockholders for the fiscal year ended Dec. 31, 1926.

The popularity of the parlor-buffet and sleeping car service operated between Indianapolis and Louisville has been the cause of an increase in passenger revenue. A new and modern line car, constructed entirely in the company's own shops, was added to the operating equipment.

In New Albany, Ind., 8,400 ft. of light-weight track in paved streets was replaced with new 122-lb. flanged girder rail supported by steel ties and laid in concrete.

The president of the company referred in the annual statement to the plan of continuing as Christmas gifts the life insurance policies for the employees, which range from $500 to $1,500 each, depending on the years of service. The company entered upon its fourth year of the Service Annuity Fund for the retirement of employees who have reached the end of their active working years.

The public relations department continued throughout the year its policy of promoting satisfactory relations between the company and the community served. Meetings of officers, department heads, operating officials and employees of the company were held regularly. The women's committee was active throughout the year, particularly in its educational program, which covered many phases of public utility activities.

The work of the safety department was actively continued.

Abandonment in New York Sought

The Hudson Valley Railway, Albany, N. Y., applied to the Public Service Commission on Nov. 11 for permission to abandon its Thomson-Greenwich branch as of Nov. 4, because of the damage by high water at the Battenkill River, near the American Woodboard Company's plant, resulting in washing out the company's roadbed. The petition states that the recent high waters washed out about 275 ft. of roadbed from 50 to 75 ft. wide and from 23 to 40 ft. deep. To repair the washout, the petition states, would require four or five months at an estimated cost of $60,000.

The commission on Aug. 17 approved a declaration of abandonment of the Thomson-Greenwich branch to become effective on Jan. 1. The company now asks that it be permitted actually to abandon the branch as of the date of the washout.

INCOME ACCOUNT OF THE INTERSTATE PUBLIC SERVICE COMPANY FOR THE YEAR ENDED DEC. 31

	1926		1925	
Operating revenues		$9,721,901		$8,916,453
Operating expenses (including retirement reserve, $281,651)		5,965,333		5,640,094
		$3,756,568		$3,276,359
Uncollectible bills	$19,356		$27,699	
Taxes	625,197		546,255	
		644,553		573,955
Operating income		$3,112,015		$2,702,404
Rent for leased lines		165,215		171,296
Net operating income		$2,946,800		$2,531,107
Non-operating income		28,707		38,502
Gross income		$2,975,507		$2,569,609
Deductions from gross income:				
Interest on funded debt	$1,405,349		$1,264,582	
Miscellaneous interest			54,433	
Amortization of debt discount and expense	72,232		95,816	
		1,477,581	36,933	*1,451,765
Net income for the year		$1,497,925		$1,117,844

SURPLUS ACCOUNT

Surplus, Jan. 1, 1926		$790,562		$803,544
Net income for the year, as above		1,497,925		1,117,844
				$1,921,388
Less:				
Dividends paid and accrued—				
Prior lien stock	$633,163		$584,935	
Preferred stock	366,512		222,185	
Common stock	374,025		385,416	
		1,373,700		1,192,537
		$124,224		
		914,787		$728,850
Miscellaneous credits and debits (net)		21,447		61,711
Surplus		$893,339		$790,562

* Includes dividends paid on preferred stock of Indiana Power Company to date of purchase of property.

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Personal Items

German Visitor Praises Grand Rapids

Herr R. Schwanter, assistant director engineer of the Cologne, Germany, Municipal Railway, has sailed for home after a visit in the United States in which he studied electric railway operation in New York, Buffalo, Cleveland, Grand Rapids, Milwaukee, Chicago, St. Louis, Indianapolis, Pittsburgh, Washington, Baltimore and Philadelphia. He was attracted to Grand Rapids, this year's Coffin Prize winner, by the wide publicity that company and its coaches and system received. As the guest of Vice-President and General Manager DeLamarter he spent two days inspecting the local system.

It was Mr. Schwanter's opinion that Chicago handles the heaviest street car traffic best, but that Grand Rapids by far has the most attractive cars he had seen.

H. K. Williams and P. Hill of Illinois Company Transferred

Homer K. Williams, manager of the Illinois Power & Light Corporation's interests in Abingdon, Ill., has been transferred to Galva. Phillip Hill, Galesburg, succeeds him at Abingdon. Mr. Williams went to Abingdon from Irving, where he had been in the employ of the company. Mr. Hill has been engaged in the service of the company since his graduation from Knox College several years ago.

Providence Line-Up Affected

Changes in the supervisory force of the United Electric Railways, Providence, R. I., resulting from the closing of the Olneyville carhouse are as follows:

G. S. Amidon, formerly superintendent of the Olneyville Division, has become superintendent of the East Providence Division.

E. E. Hargraves, formerly superintendent of the East Providence Division, becomes assistant superintendent.

WILLIAM P. ST. SURE, newspaper man of Oakland, Cal., has become affiliated with the Key System Transit Company as director of publicity and advertising. His appointment was announced on Oct. 8 by Vice-President Goldsmith in charge of public relations. Besides his newspaper experience on such papers as the Fresno *Republican*, Fresno *Herald* and Oakland *Tribune*, Mr. St. Sure has also taken a prominent part in civic and fraternal affairs.

ARTHUR T. GEORGE, assistant attorney of the California Railroad Commission for the last two years, submitted his resignation on Sept. 13 to the commission effective Oct. 1, 1927. Mr. George will be associated with the firm of Newlin & Ashburn in the city of Los Angeles.

Corporation Expert Heads Kansas City Company

Powell C. Groner, whose election to the presidency of the Kansas City Public Service Company, Kansas City, Mo., was announced in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 5, page 885, is best known for his untiring efforts and outstanding accomplishments on the reorganization committee of the Kansas City Railways. Here he acted as counsel and at the termination of the receivership was appointed general counsel for the present company. As a

P. C. Groner

corporation attorney for that property he established a fine reputation for himself, winning even more distinction because he is one of the youngest executives in the electric railway field.

From 1913, the date of his graduation from college, until 1922 Mr. Groner engaged in general practice in both New York and Chicago, representing the Fifth Avenue Coach Company among other concerns during that period. In 1922 he joined the firm of Newman, Saunders & Company, Inc., public utility operators and investment bankers, and has been a member of that organization since then.

Mr. Groner was born in Norfolk, Va., on Feb. 13, 1892. He received his academic and law education at the University of Virginia, specializing in corporation and public utility law.

COURTLAND L. HORTON, Winsted, Conn., has been appointed superintendent of the Torrington-Winsted branch of the Connecticut Company to succeed the late Frank Hopkins. Mr. Horton has been connected with the Connecticut Company since 1909, serving as cashier of the branch for several years and more recently as assistant to the superintendent.

Joseph W. Hicks Gives Journalism Lectures

Joseph W. Hicks, former assistant city editor of the Oklahoma City *Times* and now connected with the publicity department of the Byllesby Engineering & Management Corporation in Chicago, has been invited by the Medill School of Journalism of Northwestern University to give a series of lectures at the night school. Mr. Hicks will lecture one night a week for sixteen weeks on editing house organs, conducting trade publications, handling sales bulletins and similar related subjects.

Mr. Hicks is a graduate of the University of Oklahoma. Two years ago he accepted an offer from the Byllesby company in Chicago to start and then to edit a publication for executives. He established "Byllesby Management."

E. E. MITCHELL, superintendent of transportation of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has been given the additional duties of track supervisor.

IVAN BOWEN has resigned, effective Jan. 1, 1928, as a member of the Minnesota Railroad and Warehouse Commission to practice law in Minneapolis. Mr. Bowen was appointed to the commission in 1921 and was renamed for the six years expiring on Jan. 1, 1929. As a member of the commission he has had to do chiefly with railroad rate matters and those pertaining to the licensing and regulation of bus and transfer lines under the new state traffic law.

J. P. W. BROWN, vice-president and general manager of the Nashville Railway & Light Company, Nashville, Tenn., was recently named chairman of the Tennessee Public Utility Information Bureau. He succeeds the late Percy Warner, who was chairman from its organization in 1922 until his death in 1927.

F. KRUG was recently appointed general manager of the Porto Rico Railway, Light & Power Company, San Juan, P. R. He has been serving as acting general manager.

OBITUARY

James Cox Brady

James Cox Brady, prominent financier, industrialist and philanthropist, died at his home in New York City on Nov. 10. Mr. Brady's father, Anthony N. Brady, was one of the organizers of the old Brooklyn Rapid Transit Company and his brother, Nicholas F. Brady, was president of the New York Edison Company. James Cox was the financial man for the Brady interests, while Nicholas F. assumed responsibility for the executive work

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connected with the organization and merging of public utility properties. At the time of his death Mr. Brady was first vice-president and a director of the Brooklyn Edison Company and a director of the Mohawk-Hudson Power Corporation and of other industrial organizations. He was 45 years old.

Nathan J. McAloney

Nathan J. McAloney, district supervisor of the carhouse division, Pittsburgh Railways, Pittsburgh, Pa., died at his home in that city recently. He entered railway work in Denver, Col., with the Denver City Tramway, where he remained for a period of ten years as a pipefitter, car inspector and later as an air brake specialist. From Denver he went with the Emory Lubricating Company in St. Louis, Mo. Later he moved to Chicago, where he remained for a period of six years with various automobile concerns. On Sept. 17, 1918, Mr. McAloney returned to the railway industry and was employed as a car repairman for the Pittsburgh Railways at the Manchester shop. He steadily advanced and on Oct. 1, 1926, was promoted to district supervisor of the interurban district carhouses.

While employed by the Pittsburgh Railways, he attended the Carnegie Institute of Technology at night, and was graduated in the year 1923. Mr. McAloney was 49 years old.

George H. Benjamin

George H. Benjamin, industrial engineer and patent expert, died at his home in New York on Nov. 10. He was frequently retained as a patent expert and counselor by several of the large electrical companies and at one time was the sole American representative of the Siemens interests in this country. In the course of an active and unusually useful life Mr. Benjamin cultivated a diversity of interests which made him a man of many accomplishments. In addition to being internationally known as a patent expert and industrial engineer he was noted as a criminologist and had been consulted by Scotland Yard as a technical expert. He was graduated from the Albany Medical College, later practicing surgery for a period of five years. His famous library bespeaks the literary taste of a man who was a writer of talent.

Samuel W. Adler, a prominent figure in the receivership suit of the United Railways, St. Louis, Mo., eight years ago, died in his home in New York City on Nov. 8. Mr. Adler was personally a heavy stockholder and bondholder of the United Railways and in 1919 was named the plaintiff in one of the several receivership suits brought in the United States courts against the railway. It was under the Adler suit that Rolla Wells was named receiver for the company. Mr. Adler was 62 years old.

Manufactures *and the* Markets

Talk of Car Purchase Renewed at Seattle

The deal for 80 new cars for the Seattle Municipal Railway, Seattle, Wash., is expected to be completed now that the United States District Court of Appeals has handed down a favorable decision in the litigation brought by J. C. Von Herberg involving the right of the city of Seattle to make principal and interest payments to Stone & Webster for the Seattle railway system until employees of the system are paid. Mr. Von Herberg sought to have the court declare that operating expenses had priority over bond interest payments. This point the court disallowed.

About a year ago the city of Seattle, through the Board of Public Works, opened bids for this rolling stock, the St. Louis Car Company, St. Louis, Mo., submitting the best offer, $1,420,000. At this time the board awarded the contract to the low bidder, contingent upon the sale of bonds covering the purchase price. These bonds, it was stated, could not be sold advantageously until the case in the U. S. District Court was settled.

The railway department has more than 600 cars in operating condition, but D. W. Henderson, general superintendent, states that a saving far in excess of the interest on the proposed bond issue for the purchase could be made by substituting new cars for the old ones. The new cars, he stated, would be built for either one or two-man operation.

Under the agreement with Stone & Webster when the Seattle car lines were purchased from the Puget Sound Traction, Light & Power Company, the city of Seattle must pay $883,000 a year principal and interest at 5 per cent. The last payment, made in March, involved $507,041 interest and left a balance of $10,002,000 due Stone & Webster.

Center of Industry Continues Westward Movement

According to calculations recently made by the Geological Survey, Department of the Interior, the center of industry in the United States in January, 1926, was about 50 miles southeast of Chicago. This point is approximately near Valparaiso, Ind., about 170 miles due north of the 1920 center of population near Whitehall, Ind., and about 640 miles east by north of the geographic center, somewhere near Smith Center, Kan.

This determination of the center of industry is based on the capacity of steam engines, steam turbines, water wheels and internal combustion engines installed in manufacturing plants and in public utility power plants. Twice the weight is given to the power equipment in public utility plants, as it is used twice as much as that in manufacturing plants. This method is believed to give more representative results than previous determinations of the center of industry, which have been based only on the installed capacity of prime movers in manufacturing plants.

The findings of the Geological Survey show that the 1926 center of industry was 25 miles southwest of its 1918 position and approximately 75 miles southwest of the 1908 center. In other words, the total shift from 1908 to 1926 was about 75 miles in a west by south direction.

This slow movement of the center of industry during a period when the capacity of prime movers in central stations and manufacturing plants increased about 140 per cent indicates that industrial development in the United States is proceeding at about the same rate in all sections, although a trifle more rapidly in the West and South.

Consumers' Stocks of Bituminous Coal Greater

Consumers' stocks of bituminous coal amounted to 61,900,000 tons on Oct. 1, according to a survey just completed by the United States Bureau of Mines, Department of Commerce. In comparison with the final revised figure for July 1—63,400,000 tons—this is a decrease of 1,500,000 tons. On Oct. 1, 1926, the stocks were 43,000,000 tons.

Exports during the third quarter of the year were normal, averaging 351,000 tons a week. Home consumption averaged 8,360,000 tons, as against 9,050,000 tons in the similar period last year. The decrease of 7.6 per cent reflected diminished activity in the steel, automobile and other industries. With colder weather, however, the weekly consumption tends to increase and in the last quarter of 1926 it averaged 11,200,000 tons. In addition to the stocks of consumers there were 9,905,547 tons of bituminous coal on the docks of Lakes Superior and Michigan. Stocks of anthracite are fully up to normal for this season of the year.

White Motor Official to Act as Assistant to President

Saunders Jones, vice-president of the Southern region of the White Motor Company, with headquarters in Atlanta, is, according to an announcement by President Walter C. White, being transferred to the home office of the White Motor Company, where as vice-president he will act as assistant to the president.

Mr. Jones' work in the southern re-

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gion will be taken over by C. B. Cowan, district manager at Birmingham, pending appointment of a vice-president.

Ohio Brass Creates New York Executive Branch

In recognition of the constantly increasing growth of the utility and industrial interests which are concentrated in the Eastern states, the Ohio Brass Company has decided to create an executive branch in New York City, covering New England and the territories served by the present New York and Philadelphia sales offices.

It is anticipated that the establishment of this executive branch will better enable the company to serve the industry in the broad sense and will develop a more intimate relationship with this large center of utility and industrial activity.

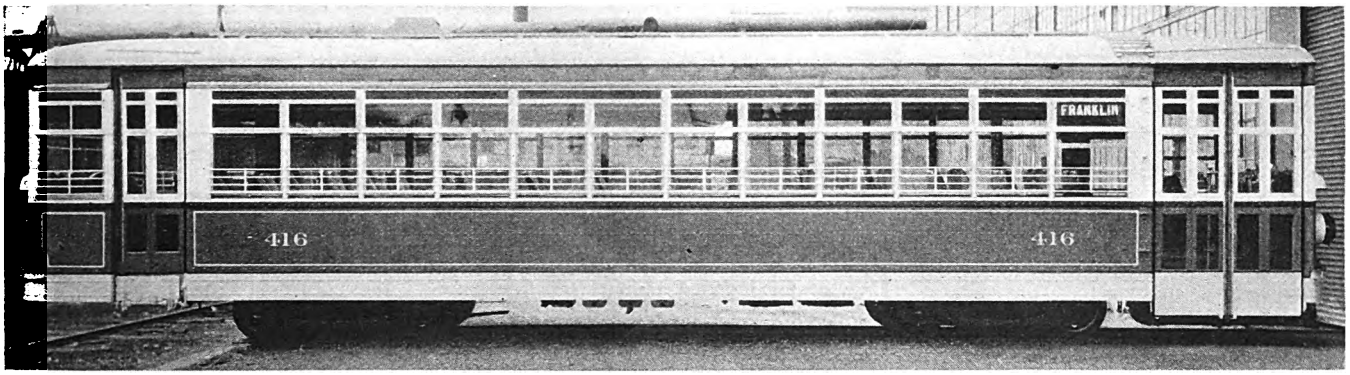
This change will be made effective about the first of the year, with Frederic Attwood in charge. Mr. Attwood is well known in the electrical industry, both here and abroad, having directed the interests of the Ohio Brass Company in Europe for several years and has recently returned to this country to undertake the organization and direction of the New York executive office.

New South Shore Passenger Station Enlarged

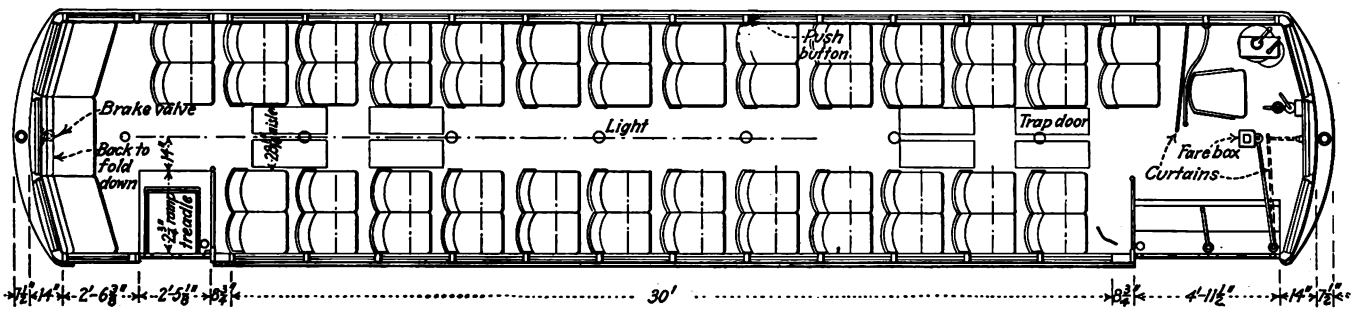
The new Chicago, South Shore & South Bend Railroad passenger station now being remodeled at South Bend, Ind., will occupy the entire main floor of the present building, 85 by 65 ft. The present station was remodeled less than two years ago, but it has become necessary, it is understood, to provide larger terminal facilities because of the rapid growth of business out of South Bend both on the South Shore and the Golden Arrow route to Detroit, Mich.

In the new floor area will be a waiting room 65x50 ft. for both South Shore

Twenty-Car Order for Houston Recently Delivered



Exterior view of one of the twenty units for the Houston Electric Company



Seating arrangement of new Houston cars

Delivery of the twenty one-man, single-end, double-truck, semi-steel cars built by the St. Louis Car Company has recently been completed to the Houston Electric Company, Houston, Tex., which is under the executive management of Stone & Webster, Inc. This order was noted in the JOURNAL for June 18.

The cars will have an over-all length of 44 ft. 11½ in., total weight of 36,000 lb. and a seating capacity for 57 passengers. The exterior color scheme is blue, cream and red and the interior trim mahogany and the fittings nickel plated.

One of the cars was on display at the convention of the American Electric Railway Association in Cleveland the early part of October and attracted a great deal of attention and favorable comment. Subjoined are specifications, released a short time ago by C. O. Birney, superintendent of car construction for Stone & Webster, Inc. It is planned to publish in a subsequent issue a more extended article relative to the reasons for adoption of this type of car and its successful introduction the early part of this month.

Number of units	20
Type of unit	One-man, motor, passenger, city, single end, double truck
Number of seats	57
Builder of car body	St. Louis Car Company
Date of delivery	Oct. 27
Weights:	
Car body	18,400 lb
Trucks	9,000 lb.
Equipment	8,600 lb.
Total	36,000 lb.
Bolster centers	22 ft. 0 in.
Length over all	44 ft. 11½ in.
Length over body posts	31 ft. 5½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8½ in.
Height, rail to trolley base	10 ft. 0 in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch, canvas covered
Doors	End, folding
Air brakes	Westinghouse type B 100 per cent
Armature bearings	Plain
Axles	4 in.
Car signal system	Faraday
Compressors	Westinghouse DH-16
Conduit	Flexible, transite lined wood box
Control	K-75-A
Curtain fixtures	National Lock Washer, type C
Curtain material	Double-faced Pantasote, drapes at rear end
Destination signs	Hunter
Door mechanism	National Pneumatic
Energy-saving device	Economy meters
Fare boxes	Johnson, air operated
Finish	Enamel, blue with red trimmings
Floor covering	¼-in. rubber mosaic tile
Gears and pinions	Helical
Glass	DSAA
Hand brakes	St. Louis Car Co., drop handle
Hand straps	Sanitary
Headlights	Golden Glow, type SE
Headlining	Haskelite
Interior finish	Mahogany, nickel-plated fittings
Journal bearings	Plain
Journal boxes	St. Louis Car Co.
Lamp fixtures	Safety Car Heating & Lighting Co., center bowl type
Motors	Four Westinghouse 510-A, inside hung
Safety car devices	Safety Car Devices Co.
Sash fixtures	Curtain Supply Co., brass
Seats	Bus type, stationary
Seat spacing	30 in.
Seating material	Hyaline, analine dye, hand buffed
Slack adjusters	American Brake Co., type E
Stanchions	Aluminum
Steps	Rear folding, front stationary
Step treads	Feralun and Kass
Trolley catchers	Keystone
Trolley base	Ohio Brass, No. 45-41
Trolley wheels	Ohio Brass
Trucks	St. Louis EIB-64
Wheels	Rolled steel, 26 in.
Wheelguards	H.B., six-bar

Special devices: Variable load brake, rear door treadle, Oskelite stop signal, Bennett race sign, colored top gothic glass, copper air pipe, and group installation, dasher flood lights, two headlights front end, skirt, back-up arrangement, Westinghouse TC-2 switch with PV-3 brake valve.

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and Shore Line motor coach passengers on the Golden Arrow route to Detroit, an outing and recreation information bureau, a ticket booth, a fountain concession, a women's rest room, men's smoking room and telephone facilities. Plans for the remodeling call for an interior much like that of the new South Shore station at Michigan City, Ind.

Copper Continues to Show Strength

The continued strength in copper, both in the United States and abroad, with good sales at higher prices, is the feature of the metal market for the week ended Nov. 16. Zinc and tin prices have also advanced slightly, though the market position of these metals does not appear so firm as that of copper.

Sales of copper in the week ended Nov. 16 have again been very satisfactory in the domestic market and considerably better than that abroad. The price for usual Eastern deliveries has advanced from 13⅜ cents to 13½ cents, the last-named quotation having been realized on heavy sales Nov. 15 and 16. A good tonnage was also sold in the Middle West at 13⅝ cents. Abroad, it is said, cable manufacturers have been heavy buyers, though they have shown little interest here recently. The foreign price continues at 13.80 cents, c.i.f., with the buying practically all for prompt shipment. An encouraging feature of the copper situation at present is that the improved market comes as the result of a bigger demand rather than decreased production; the rate of world copper production in October was the greatest in history, with the exception of February, 1927, and November, 1926, and yet world stocks at the end of that month were the lowest for a long time. In other words, the increase that has been made in total production appears fully justified.

Monotonous is the best word to describe the domestic lead market. Buying has been neither brisk nor dull; and prices have been uniform at 6.25 cents New York and 6 cents in the Middle West, at which levels a good business was done each day. The American Smelting & Refining Company continues its contract price for the New York market at 6.25 cents. It has been at this level for about two months now, a comparatively long period for recent years. Prompt and November deliveries easily predominate.

Buying at 5.60 cents, St. Louis, was heavy, galvanizers feeling that such a low price was not likely to persist, and endeavoring to buy for future requirements so far as they dared. This buying, coupled with the fact that some producers withdrew from the market, caused an upward reaction, with the result that 5.65 cents was the lowest price for the last two or three days and 5.70 cents was secured on some orders, largely for forward delivery.

The technical position of spot Straits tin has been weak since the first of November, one reflection of this being the narrow spread between Straits and metal of 99 per cent quality. The position appears to be improved somewhat, however. London advanced sharply on Monday, and this buoyed the domestic price temporarily, though consumers were not interested to any great extent. Forward shipment is at a discount of less than ½ cent.

ELECTRIC RAILWAY MATERIAL PRICES—NOV. 15, 1927

Metals—New York

Copper, electrolytic, cents per lb	13.275
Lead, cents per lb	6.25
Nickel, cents per lb	35.00
Zinc, cents per lb	6.025
Tin, Straits, cents per lb	57.0
Aluminum, 98 or 99 per cent, cents per lb	25.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.075
Somerset mine run, Boston	1.90
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	1.55
Central, Ill., screenings, Chicago	1.125
Kansas screenings, Kansas City	2.175

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.775
Tie plates (flat type), cents per lb	2.25
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.75
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb	2.80
Sheet iron, galvanized (24 gage), cents per lb.	3.65
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	2.40

Waste—New York

Waste, wool, cents per lb	14–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	14–19.50
Colored	9-16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.6
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal	$0.545
Putty, 100 lb. tins, cents per lb	5.25–5.50

Wire—New York

Copper wire, cents per lb	15.25
Rubber-covered wire, No. 14, per 1,000 ft.	5.50
Weatherproof wire base, cents per lb	15.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.85
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y	1.75
Sand, cu.yd., f.o.b. N. Y	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb	11.25
Light copper, cents per lb	10.00
Heavy yellow brass, cents per lb	7.25
Zinc, old scrap, cents per lb	3.50
Lead, cents per lb. (heavy)	5.25
Steel car axles, Chicago, net ton	$14.75
Cast iron car wheels, Chicago, gross ton	13.50
Rails (short), Chicago, gross ton	14.75
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.25

TRACK AND LINE

MINNEAPOLIS STREET RAILWAY, Minneapolis, Minn., was reported a short time ago as being ready to begin operation of a double-track line on 50th Street from Bryant Avenue south to Penn Avenue, nineteen blocks, and a single-track extension on Penn Avenue from 50th to 54th Street, four blocks as a part of its Bryant-Johnson through car line. In addition the company double tracked the 50th Street line from Xerxes Avenue south to Penn Avenue, eight blocks, this season. This improvement is in operation, as part of the Oak-Harriet line, which terminates at Penn Avenue.

CAROLINA POWER & LIGHT COMPANY, Asheville, N. C., started work a short time ago on the new street railway link from Broadway and College Street, westward on College to Haywood Street. Work was commenced at both ends of the proposed line and service on it will be instituted, it was expected at that time, within the next three months, as all materials to be used on the job had arrived. According to officials of the company work will be pushed to completion as rapidly as possible. The new track, it is understood, is planned for use as a cut-off link and it is expected will relieve congestion at Pack Square and permit faster schedule on all lines.

TRADE NOTES

ROLLWAY BEARING COMPANY, INC., Syracuse, N. Y., announces the opening of a sales offices at 956 Leader Building, Cleveland, Ohio. R. D. Faris has been appointed Cleveland district representative and will make his headquarters there.

AMERICAN ENGINEERING COMPANY, Lo-Hed Hoist Division, Philadelphia, Pa., announces the appointment of direct factory representatives in Pittsburgh and Cleveland for the sale of its Lo-Hed monorail electric hoists. The Pittsburgh office, whose territory will include western Pennsylvania, West Virginia and counties along the eastern border of Ohio, is located in the Oliver Building, with D. A. Polhemus in charge and John Kaiser assisting. W. C. Minier, with offices at 2195 Bellfield Avenue, Cleveland, will direct sales in northern Ohio, except for territory surrounding Toledo.

AMERICAN MANGANESE STEEL COMPANY, INC., Chicago Heights, Ill., recently announced in a letter that it had purchased the foundry of the American Brake Shoe & Foundry Company at Burnside on the south side of Chicago. They advise that this will make their seventh foundry: that the date set for beginning operations at Burnside under Amsco Management is Jan. 1, 1928, although it may take place sooner, and that in the meantime the present customers of this foundry may be sure of entirely adequate service.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, November 26, 1927 *Number 22*

Labor's Insistent Attitude

GREATLY to be deplored is the situation that confronts the Des Moines City Railway, just placed in the hands of receivers. It is a case with many angles, but no stigma attaches to the management for not trying to play its part in giving the city the best possible in the way of progressive operation. Some back history is essential to an intelligent understanding of the situation. The franchise under which the company operates was adopted in 1921, following a receivership of several years duration. It provided that the operating deficit then existing should be amortized out of expected earnings over a period of five years. Debenture bonds were issued to obtain funds with which to pay outstanding claims and lift the receivership. The earnings anticipated in the franchise provision for amortizing the old operating deficit were pledged as security for payment of the debentures.

As previously indicated, the management was thoroughly conscious of its obligations to the city. If the railway had sacrificed service and allowed the property to deteriorate the operating deficit might have been amortized and the debentures paid off. The management felt, however, that conditions would improve sufficiently to permit the issue to be refunded before maturity in April, 1927. Following adoption of the franchise nearly $1,500,000 was spent in rehabilitating and improving the property. Notwithstanding this effort the road continued to show losses and the debenture holders finally felt that it was necessary for them to act.

Among other moves in the modernization program the company sought to avail itself of one-man car operation as a constructive measure of economy only to run afoul of a long-time union agreement requiring the use of two men on each car. The court upheld the union on the letter of the law, but apparently not on its spirit. Just how the adamant attitude on the part of the officers of the local division of the Amalgamated squares with previous pronunciamentos of President Mahon of the union on the one-man car issue is difficult to understand, but the Des Moines local had its way. The use of one-man cars on a scale of operation indicated elsewhere in this issue would save the company about $250,000 a year, even allowing for extra trainmen in the loop district, the need for whom is very questionable. This sum would just about balance the operating deficit of $129,000 piled up by the company for the first nine months of 1927.

As the secretary of the union sees it, in no city of the country has the use of one-man cars resulted in a net lowering of fares which prevailed under two-man operation. That statement is, of course, open to challenge, but the point is that the use of such cars, evidenced in the case of Des Moines, has permitted many companies to continue without increasing their fares and thus save themselves and their employees, and at the same time permit them to give to the communities in which they operate the service to which the public is entitled.

It is a very shortsighted view of the matter that the representatives of the employees at Des Moines have taken, no less shortsighted in its way than is the attitude taken by the employees of the Schuylkill Railway of Girardville, Pa., reviewed in the article in ELECTRIC RAILWAY JOURNAL for Nov. 19. Certainly these two cases take no account, at least on the part of labor, of the mutuality of interests that should exist between capital and labor. Industry cannot do the impossible, but certainly here and there labor expects it to be able to do so, and in fact insists that it do so.

A Constructive Viewpoint Is Necessary for Progress

RECENTLY a new street car was inspected by a number of railway officials. In it the builder had made a sincere effort to work out a vehicle which would meet the conditions of present-day transportation demand from the standpoint of attractiveness and comfort, while at the same time recognizing the need for reasonable maintenance cost and operating reliability. The builder did not pretend that this was the last word in street cars, or that the equipment and fittings in this sample car were in all cases suitable for the operating conditions existing on properties where the class of patronage might not justify de luxe appointments. But in general design and arrangement, there was no reason in the world why the car in question was not entirely suitable for the "local conditions" on a hundred or more roads in widely variant situations.

Comment by two operating officials is both interesting and illuminating. This car was built with a particular view to improving the appearance of street cars by change from the awkward lines and proportions that are outstanding features of so many cars now in service. In fact, the design was the direct result of co-operation between a manufacturer and a railway operating official, who had given the matter of car appearance very careful study and analysis and had succeeded in working out one of the first successful forward steps that have been made in car appearance. To be sure, there was still room for improvement. The car under inspection was not the last word in possibilities by any means, and was considered even by the builder himself as purely experimental.

Under these conditions, the point of view of the two operating officials in question is worth consideration. One was a master mechanic. He had gone over the car and had discovered many costly features of equipment that he considered unnecessary and undesirable. In this respect he was probably right. But when his opinion was sought on the general proportions, arrangement and appearance of the car, his immediate reply was, "I could build a better-looking car myself."

Now this man was not a novice in the industry, and he had been connected with several railway properties in

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the course of his experience. Yet there was no evidence that he ever even considered the need for better-looking cars, much less that he had ever undertaken the responsibility of attempting to make any improvement in conventional practice. Just as soon, however, as somebody else tried to take a forward step, his viewpoint was entirely critical, and he began to look for the bad features in the car rather than for its good points.

The second man's viewpoint was no less illuminating. He examined the design of the framing structure and was quick to note that a collision with a 5-ton truck piled high with freight would probably cause considerable damage. Just why he selected a 5-ton truck for his discussion is difficult to determine. He could have made out a much better case against the new car by commenting on the damage that would be done if it were hit by a steam locomotive. Yet would anybody seriously hold that street cars should be designed to withstand collision with a steam locomotive? If not, then why a 5-ton truck? Would this man's private automobile, in which he probably travels at much higher rates of speed than those attained by street cars, withstand collisions with a 5-ton loaded truck, or even a 1-ton truck for that matter? He depends on his brakes and not on his bumper to keep him out of the hospital when he is sharing the road with freight-carrying vehicles.

What does all this indicate? Doesn't it mean that there is still considerable room for straight thinking on the part of transportation men regarding the requirements in street car design to meet present-day conditions? In the very city from which the critical officials hail, the railway operation is being threatened by bus competition. But if the bus men undertook to design their vehicles to withstand collision with 5-ton trucks, it is probable that they wouldn't have much success in competing with even the dilapidated, awkward and obsolete cars that are operated on some of the rail lines in that city.

The industry will make little progress in the improvement of cars until there is a more receptive and constructive viewpoint on the part of operating executives than that displayed in the comments here recorded.

Boston's Latest Rapid Transit Line Embodies a New Principle

PARTICULAR interest attaches to the Dorchester extension of the Boston Elevated Railway system which was opened on Nov. 5. Not only is it an excellent piece of construction which will serve a large portion of the population in the southern section of Boston, but it embodies a principle in rapid transit expansion that has long been talked about but never adopted. That is the utilization of an existing steam railroad right-of-way for a rapid transit line, as distinguished from an electrified division.

In the Dorchester situation the Shawmut branch of the New York, New Haven & Hartford Railroad had been in use for many years, connecting the South Station in Boston with a terminal at Mattapan. The service given was as good as that on other suburban branch lines of the same company, but of course its value was limited, as the only station in the metropolitan district was too far from many of the activities of residents in the suburban territory. The purchase of the line by the city and its conversion to rapid transit service has been advantageous to the residents in two ways. First, the new line is an extension of the Cambridge subway, and when completed it will permit through rapid transit train service from Mattapan to Harvard Square, with transfer to the other lines of the Boston Elevated system reaching all parts of the metropolitan area. Second, the provision of transfer stations where residents of the district may change from the trains to surface cars and buses or *vice versa* makes for reduced travel time for everyone, whether living adjacent to a rapid transit station or at some distance away. Neither was possible with steam operation.

Many other steam railroad lines in the larger cities of this country are limited in capacity under existing methods, but would have tremendous possibilities if connected with the rapid transit lines, or used as a nucleus for a rapid transit system in a city not so served. In general they would furnish rights-of-way at much less cost than that incident to the construction of subways, and with less disfigurement to the city than the erection of elevated lines. The plan is worthy of study wherever rapid transit is contemplated.

Helping the Industry to Help Itself

PRESIDENT STEVENS is taking a decidedly forward and helpful step for the industry in appointing again this year a committee on electric railway finance, somewhat along the lines of the committee which functioned so effectively in 1925. Although electric railways have lagged seriously in taking the financial medicine recommended by the 1925 committee, there has been general agreement among those who are in a position to judge that voluntary readjustment of the financial structures of many properties, though a bitter pill for some security holders to swallow, is in many instances essential for the relief of a topheavy and distorted financial structure.

The former committee prepared figures to show the relatively small margin in electric railway earnings, for the industry as a whole, over fixed charges. Under these conditions, the high cost of money for capital additions, the high rate of interest that must be paid for refunding maturing obligations and the impossibility of raising new money through the sale of preferred stock, all constitute important obstacles to progress and improvement. Estimates were presented to show the relation between the earnings-to-fixed charges ratio and the cost of new money. These were carried out further to show the trend of net earnings under high fixed charge conditions in comparison with the results which would follow a voluntary scaling down of these fixed charges. The figures all gave convincing proof that the acceptance of junior securities by some present bondholders would result in the protection of existing investments through permitting operating companies to obtain needed new money on more favorable terms.

Unfortunately, the industry has been slow to carry out the recommendations of the 1925 finance committee. Through the appointment of a new committee this year it is to be hoped that the importance of this subject may again be brought home to the industry, to the end that financial readjustments vital to the establishment of more favorable credit may be brought about.

Another important step is contemplated by the formation of a sub-committee to study the possibility of working out an electric railway car trust plan that will make it possible for even small properties to acquire new cars on favorable terms of down payment, financing period and interest rate. This again is an important step in the direction of helping the industry to help itself.

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The Staten Island Fiasco

FINIS will be written within ten days to former Mayor Hylan's abortive attempt to supply service by municipal operation of car and trolleybus on Staten Island after the local railway there had found it impossible to continue operation. On Dec. 5 the equipment, now nondescript, which has been in service there four or five years under city auspices, will be sold for what it will bring. Matters really came to an impasse last July when the Staten Island Edison Company cut off power because of the failure of the city to pay a debt of $175.000. Suspension of service followed on Aug. 1.

It was with the fanfare characteristic of the man that the former Mayor assumed the burden of operation on Staten Island under a 5-cent fare, with the city making up the difference between that rate and the actual cost of 12 cents per passenger. In five years the municipality, operating the trolley lines under lease from the receiver of a road that had previously been run privately, lost $375,000. In addition to this the trackless trolleys, on a total capital investment of about $275,000, showed a deficit of $300,000 in four years of city operation.

Meanwhile the Tompkins Bus Company is furnishing temporary service at a 10-cent fare and has been awarded permanent operating rights by the Board of Estimate under a 5-cent zoning plan, but is being required by the Transit Commission at a hearing on Nov. 25 to furnish proof of its financial standing. This company's buses, admittedly overcrowded, are doing the best they can under the circumstances, but the outlook is not rosy in the face of the fate of the privately run railway and of its successor, the municipal railway and trackless trolleys.

Surely Staten Islanders who listened to the speeches of the friend of the people made at the Restoration Hospital and at Tottenville at the time of the ceremony in connection with this ill-advised attempt by the city to do publicly what it had been found impossible to do privately must now be conscious that a vast gap often separates promise and practice, particularly when both are political.

Restoration Since Receivership in Brooklyn

ANOTHER excellent annual statement has been turned in by the Brooklyn-Manhattan Transit Corporation. The report, which is for the year ended June 30, 1927, shows an increase in the net income of $600,257 over the previous year. Total operating revenues were up $1,869,-625. The report serves to substantiate the statement made in the past about the excellent record of the company since the reorganization several years ago. The company may be handicapped by the failure of the city to meet its contractual subway obligations in connection with the construction of the Nassau Street loop subway and by the delay in the completion of the Eastern district rapid transit extension, but these omissions on the part of the city are not being allowed to militate against the company pushing its own "policy of keeping the properties in excellent condition and of furnishing as good service as possible, limited as to rapid transit lines by the facilities provided by the city."

These last are the company's own words, but they are borne out by the facts, evident even to the least observing of the road's own patrons. Reduced to tangible terms the company has expended $22,429,270 in the last two years for maintenance of way and structures and equipment, including reserves for depreciation. This is 24.5 per cent of the total operating revenue of $91,551,560 for the last two years. Two hundred and thirteen more cars have also been purchased. With no appreciable increase in mileage in the last ten years, the number of passengers carried by the rapid transit lines has increased from 265,400,020 to 658,271,663. At the same time the number of surface car riders has increased from 255,569,584 to 269,928,710, a figure that shows these lines to be holding their own well and serves to give the lie to those who would ignore them as factors in any plan for the unification of the transit facilities of the city. An annual report is an annual report in the sense that it does no screaming on its own account. It is too bad that the message of the report, necessarily submerged in the brief comments which it contains and the compilations of figures, will probably be lost to the general public, for back of these there is a real story—a romantic story of restoration since receivership.

Freight Business Can Be Sold

LATENT possibilities exist on many electric railways, even though they may not be discovered until the hour of dire need has approached. As an example of this, the Clinton, Davenport & Muscatine Railway, Davenport, Iowa, had reached the limit of economies in the installation of one-man cars, labor-saving devices, and improvements in the passenger service such as more frequent schedules and modernized cars. Still the net result of all these efforts merely resulted in retarding the rate of decrease of passenger revenue. For this reason it turned to the development of the freight business, more as the struggle of a dying man than with any great hope that it would bring prosperity.

The story of how the company purchased new freight locomotives, built sidings and transfer connections with the steam roads, established through rates and performed various other transitory operations was told by C. F. Dege, general superintendent of the company, before the Iowa Electric Railway Association at its recent meeting. But more of an accomplishment than the physical equipment to handle the business was the way the employees of the system organized to go out after business. The methods employed are commendable. Every employee became a salesman. This necessitated considerable effort on the part of the management to develop tact and courtesy, and to instill into the men the value of personal contact. They were taught so to approach the customers as to promote good will and to create in their prospects a feeling of confidence.

While the company secures a large amount of freight through solicitation by its trainmen, there are full-time solicitors and several department heads who at stated intervals visit the districts served by the interurban, assuring a complete coverage. Other practices which are bringing more business to the road are the careful handling of freight, inspecting the condition of goods upon receipt and delivery, minimizing delay at transfer points, notifying the consignee immediately on the arrival of a shipment, and advising the shipping association and traffic clubs of the company's activities.

Figures given by Mr. Dege prove that it pays to go after the business. In 1916 the interurban carried 30,432 tons of freight. Ten years later, in 1926, the gross tonnage was 194,586—more than six times as much. Moreover, he states, the company is convinced that the field has only been touched and that freight is destined to become the major source of revenue for the company. Surely this is a result worth pondering.

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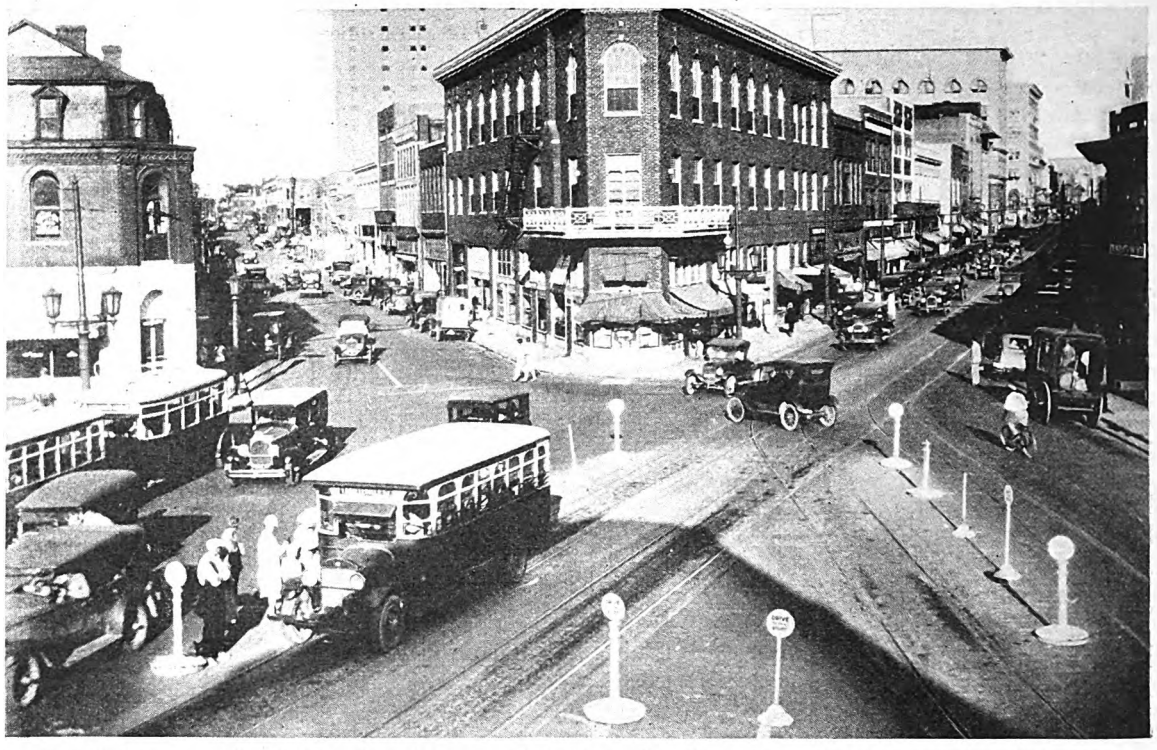

At this location—Five Points—three heavy traffic-bearing streets intersect. The safety zone installation here has resulted in a decrease of accidents

Progressive Management Retrieves a Small Property

Facts given in Coffin Prize brief show how a railway in a town of only 45,000 inhabitants changed the deficits to a surplus by studying the transportation needs of its community and then meeting these needs with modern equipment

DURHAM, N. C., has only about 45,000 inhabitants, and in respect to the size of the city served the brief submitted for the 1927 Coffin Prize by the Durham Public Service Company is unique. Modestly, its brief tells the history of this company during the past five years, a story replete with interest, especially to other properties of similar size, because it shows what can be done—and has been done—to bring such a property into good financial and physical shape.

Industrially, Durham is one of the leading cities of its state, being famous for its output of tobacco, textiles, hosiery, yarn and bag products. It is also an educational center, being the home of Duke University, and only 12 miles from the University of North Carolina.

The electric railway system dates from 1902 and operating conditions were favorable up to the outbreak of the World War. Then expenses increased rapidly, and though the company received two fare increases its net earnings were unsatisfactory. The downward trend in net continued until 1924, when the company was faced with the early need of spending $125,000 for track construction and paving, $36,000 to replace obsolete rolling stock and $13,000 as its part of removing a grade crossing within the city. This sum was in addition to $325,000 which the company had expended during the previous five-year period on roadbed, paving and rolling stock. The conditions prevailing with respect to gross and net earnings for the six-year period ended with June, 1927, are disclosed in Table I.

Co-ordinated Plan of Bus and Rail Operation Adopted

The first step taken in the constructive program was the adoption of a co-ordinated plan of bus and car operation on the basis of rendering a service which would attract public approval and patronage by meeting present-day demands for service with present-day methods. This meant that the entire routing plan had to be revised. During the previous ten years the city had grown rapidly in certain directions and its traffic arteries had changed. Some car routes were rendering a needed service, while others, aside from serving low-traffic-bearing areas,

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showed heavy losses and no prospect of ever developing satisfactorily.

Poorly patronized routes without indication of future traffic increases and in bad physical repair as to track were immediately abandoned and bus operation substituted. In the first month of bus operation, March, 1925, approximately 8,000 bus-miles were operated with a bus-mile revenue of only 11.5 cents. The progressive increase resulting from the six months period is shown

TABLE I—SIX-YEAR STATEMENT OF EARNINGS AND EXPENSES DURHAM STREET RAILWAY AND BUS SYSTEM, AS OF TWELVE MONTHS ENDED JUNE 30

	Gross Revenue	Operating Expense*	Net Earnings
1922	$162,182	$155,440	$6,742
1923	165,945	143,470	22,475
1924	158,612	143,871	14,740
1925	147,074	152,919	(D) 5,845
1926	169,256	164,068	5,188
1927	196,329	188,085	8,245
1927†	200,250	177,840	22,410

* Replacement reserve included.
† Estimate for twelve months ended Dec. 31, 1927.
(D) = Deficit.

TABLE II—PROGRESSIVE INCREASES IN EARNINGS PER BUS-MILE AND PER CAR-MILE, DURHAM STREET RAILWAY SYSTEM

Period Twelve Months Ended	Bus Operation: Bus-Miles	Bus Operation: Earnings Per Bus-Mile, Cents	Electric Railway Operation: Car-Miles	Electric Railway Operation: Earnings Per Car-Mile, Cents
June, 1925	55,861	14.9	738,808	20.3
December, 1925	190,706	16.7	620,816	19.1
June, 1926	363,761	17.9	508,883	20.4
December, 1926	487,789	18.9	438,231	22.0
June, 1927	575,808	19.2	359,297	23.8

in Table II, which also gives data on car-mile revenue. In the latter it will be seen that there was an improvement during 1927, as compared with 1925, of 3.5 cents in revenue, largely as a result of co-ordinated service and improved operating conditions. Incidentally it was found that the buses maintained an average speed in excess of 10 m.p.h., as compared with approximately 8 m.p.h. on the cars, as, with the exception of the trackage in the business area, the railway layout was single track with turnouts. Moreover, with the bus, it was found possible to enter new territory impossible of being served by rail operation.

Through Service Given

Experience with co-ordinated service showed soon that under Durham conditions so-called feeder operation was not popular and passengers on the buses must have a direct service into or through the business section.

At this particular factory approximately 1,000 negroes are employed. By the operation of special buses between this point and the negro residential district heavy patronage is secured and overcrowding of regular cars and buses with these passengers is eliminated

With the buses, also, the opportunity for chartered service returned. Chartered service with cars had long passed, but with buses the company is securing an increasing amount of business from lodges, schools and churches and for other prearranged trips. Considerable regular school business also is being done. As this chartered service ordinarily does not come at the same time as the maximum of demand of regular service, it increases the average daily miles operated per bus.

Types of Cars and Buses Operated

The cars now operated locally are modern light-weight, double-truck, one-man safety cars, and special endeavor has been made to maintain these cars in a well-painted, cleanly condition. All cars are repainted on regular schedule and, with the prevailing color scheme of deep orange and cream with black lettering and striping, have a very attractive appearance. Both cars and buses are washed outside and cleaned inside on regular schedule. Comment on the comfortable riding qualities of the buses led to the decision to replace existing seating equipment on the street cars with spring-edge, leather-upholstered seats and cushions, and this work is now progressing.

In its selection of type of bus the company made an extended study into the most desirable size for its conditions and decided on the 21-passenger bus. It attributes much of the success of its bus service to the fact that it did not purchase a larger vehicle. Improved operating

The substitution of bus operation for railway operation on this handsome boulevard has resulted in increased revenue and has obviated heavy track reconstruction costs

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TABLE III—OPERATING STATEMENT, DURHAM BUS SYSTEM, TWELVE MONTHS ENDED JUNE 30, 1927
(Under A.E.R.A. Classification)

Acct. No.	Revenue	Amount	Per Bus-Mile
1201	Passenger revenue	$107,718.74	$0.18707
1203	Special (chartered service) revenue	1,653.20	.00287
1210	Station and bus privilege revenue	1,119.79	0.00194
1401	Total revenue	$110,491.73	$0.19188
	Expenses		
	I Maintenance of Plant and Equipment		
1301	Superintendence of plant and equipment	$997.20	$0.00173
1302	Maintenance of buildings and shop equipment	162.09	0.00028
1304	Maintenance of vehicles	12,031.97	0.02090
1306	Tires and tubes	6,875.24	0.01194
1311	Retirement reserve (accrued)	15,912.20	0.02763
	Total maintenance of plant and equipment	$35,978.70	$0.06248
	II Operating Garage Expense		
1315	Fuel for revenue vehicles (4 cents gas tax excluded)	$17,162.79	$0.02980
1316	Lubricants for revenue vehicles	1,929.31	0.00335
1317	Garage employees	2,566.18	0.00446
1318	Garage supplies and expenses	978.68	0.00170
	Total operating garage expense	$22,636.96	$0.03931
	III Transportation		
1320	Superintendence of transportation	$1,032.80	$0.00179
1321	Bus drivers' wages	27,120.68	0.04710
1325	Other transportation expense	3,648.53	0.00634
	Total transportation	$31,802.01	$0.05523
	IV Advertising Expense		
1330		49.40	0.00009
	V Administration and General Expenses		
13 34	General offices, salaries and expense	$3,386.60	$0.00588
13 35	Other general office salaries and expense	3,619.20	0.00629
13 45	Liability and other insurance (injury and damage reserve)	1,543.92	0.00268
1351	Other general expense	.....	.....
	Total administration and general expense	$8,549.72	$0.01485
1403	Total operating expense	$99,016.79	$0.17196
	Net earnings before taxes	11,474.94	0.01992
1405	Taxes (includes 4-cent gas tax)	4,951.52	0.00860
	Net earnings	$6,523.42	$0.01132
	Total expense (plus taxes)	$103,968.31	$0.18056
	Plant and equipment		
1109	Motor vehicles	102,186.07	.....
	Buildings, etc. (not allocated at present)	.....	.....
	6 per cent interest on plant and investment	4,443.06	0.00771
1420	Net profits	$2,080.36	$0.00361

conditions were also secured, according to the brief, by the adoption for these vehicles of the vacuum booster brake system and of an extra high grade of paraffin-base Pennsylvania lubricating oil costing approximately 66 cents per gallon, instead of cheaper oil. In consequence largely of these two practices the maintenance of buses (account No. 1304 in the A.E.R.A. classification) has been kept to 2.09 cents per bus-mile. The entire bus operating expense for the period June 30, 1927, is given in Table III.

Three typical views of operating conditions on this property are published.

TABLE IV—OPERATING STATEMENT, RAILWAY DEPARTMENT' DURHAM, N. C., TWELVE MONTHS ENDED JUNE 30, 1927

	Annual	Per Car-Mile
A. Revenue		
Passenger revenue	$84,048.70	$0.2339
Miscellaneous transportation revenue	110.00	0.0003
Rentals and special privileges	1,679.45	0.0047
Total revenue	$85,838.15	$0.2389
B. Operating Expenses		
Maintenance of way and structures	$6,892.49	$0.0192
Maintenance of equipment	11,214.73	0.0312
Power	12,439.35	0.0346
Transportation	24,250.71	0.0675
Traffic (advertising)	80.57	0.0002
Carhouse expense	2,495.41	0.0069
General office salaries	2,723.63	0.0076
Injuries and damages	200.00	0.0006
Other general expense	7,430.15	0.0207
Taxes	4,816.39	0.0134
Replacement reserve	11,573.80	0.0322
Total expense	$84,117.23	$0.2341
C. Net earnings from operation	$1,720.92	$0.0048

The first shows Five Points, where three heavy traffic-bearing streets intersect, with considerable consequent street congestion. All car and bus routes pass through this intersection. The principal thoroughfare is only 37 ft. wide, but safety zones through which other traffic is not allowed to pass are maintained and have aided materially in safe operation.

A second view shows closing hour at one of the large tobacco factories in which approximately 1,000 negroes are employed. Special buses are operated between this point and the negro residential district and not only enjoy heavy patronage but help to relieve the overcrowding of the regular car and bus service with negro passengers.

The third view shows one of the streets on which railway service was abandoned and bus service substituted. Residents along this handsome boulevard never patronized the car service very much as they preferred their private cars. With attractive buses, business is growing.

One-Man Operation Reduces Accidents in Little Rock

STATISTICS of the Arkansas Power & Light Company relating to the accident record of its Little Rock property show a reduction in accidents following one-man operation. These statistics are presented in the company's brief for the 1927 Coffin Prize. In 1925, when two men were used for the car, the accidents of this company totaled 1,298. The following year, with one-man operation, the accidents were 169 less. This reduction is all the more notable because during the installation of one-man service there was a period when conductors had to be trained as operators and motormen had to be sought that could make change and issue transfers rapidly. During the first six months of 1927 the accidents were on an even lower ratio, being 550 for the half year.

The company follows an extensive safety program with each employee. It has a Safety First Committee composed of one employee from each department. This committee meets once a month to discuss safety problems and make a general inspection of the various departments. Recommendations are then made to the management of any changes which the committee believes will reduce accidents. In the majority of cases the recommendations are made effective immediately.

Monthly meetings attended by the trainmen are held in the clubrooms of the carhouse. They are also attended by the shop men, superintendent of transportation, master mechanic, supervisors, and the claim agent, and there is a general discussion of means for reducing accidents and improving the public service. In addition, every employee has an opportunity to offer suggestions for improving the service by depositing them in a suggestion box. These suggestions are considered at the regular monthly meeting.

Safety contests are also conducted among the operators. The men are grouped in teams of ten each, and individual records of accidents are marked up daily on a large blackboard in the carhouse. All accidents are recorded. At the end of the month a committee of five passes on all accident reports and those accidents which indicate carelessness or negligence on the part of the operator are charged against his record, as well as against the team to which he belongs. Cash prizes are paid at the end of the year to the three teams making the best record.

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Operating Contract Plan

for Philadelphia's Broad Street Subway

J. Rowland Bibbins, consulting engineer for the city, presents plan with novel features. Full city ownership and operation by private company are proposed

ON NOV. 10 Mayor W. Freeland Kendrick of Philadelphia took the first official step in preparation for the operating of the new Broad Street subway by forwarding to Council, with his recommendations, the full report and operating agreement prepared by J. Rowland Bibbins of Washington, D. C., consulting engineer for the city of Philadelphia in these proceedings, as he also was in the fare case of 1925. It is the Mayor's stated ambition to conclude arrangements this year for subway operation during his administration, thus bringing into use the first and most important step of Philadelphia's standard gage, high-speed program.

The following discussion is abstracted from Mr. Bibbins' report.

Co-ordinated Operation and Contingent Return

A new type of operating contract has been designed by the engineer for the conditions peculiar to Philadelphia, the relative position of city and company set against the background of past and probable future growth and development. Philadelphia is the first city to undertake rapid transit trunk lines completely equipped and ready to run by any licensed operator, i.e., built complete out of city capital, of which around $100,000,000 will soon be invested in the Broad Street trunk, now nearly completed except the terminal extension to South Street.

In this contingent plan, which is essentially an operating agreement, the Philadelphia Rapid Transit Company is recommended as a licensed operator in co-ordination with its own system, for a trial term ending in 1936, about 8½ years, a sufficient time to enable both parties to gain needed experience to determine whether to carry on indefinitely. At that time and every four years thereafter the city has the right to review the agreement terms, and also the right of termination. This date is set in order to complete the major steps of the high-speed system authorized by the 1918 referendum. In 1957 the agreement is made co-terminous with the Frankford elevated lease and the 1907 city-company contract, so that the opportunity then presents itself for the city to consolidate all of the local transportation properties.

The major extension program assumed in this agreement covers only the essential lines of Broad Street to its South Street terminal, the Ridge Avenue-Eighth Street branch and the Walnut-Woodland subway-elevated to Darby, thus completing by 1935 the backbone of

Conclusions and Recommendations Summarized

1. *Recommended:* An operating agreement on the contingent return plan; city high-speed lines to be operated by P.R.T. as part of a city-wide transit system with co-ordinated feeders and the same fares, interline transfers and exchanges.

2. City has assumed the full financial burden of providing new rapid transit, hence it should receive the net revenues from city lines to support its investment. Under existing circumstances this will yield maximum city return.

3. Capital, revenues and operating expenses of the city lines to be kept separate and under continuous supervision of an experienced board of control, with appropriate city and company participation. Supervision is essential to the success of the contingent return plan, as a safeguard to the city's interests.

4. Estimated Broad Street subway earnings under this agreement are about $2,500,000 net for 1929, first year of full operation, or about 2.8 per cent on the total cost, $89,000,000, leaving about the same amount to be paid, at the start, out of taxation.

5. Broad Street subway is strategically located on the city's main traffic artery. North Philadelphia already holds over half the city's population and is growing in population and housing more rapidly than any other district. Nearly 700,000 people or two-thirds the population of this district live within the time-saving zone of influence of this subway and its feeder lines.

6. P.R.T. revenue has increased nearly $8,000,000 or 18 per cent in the two years following the last fare raise; and total traffic in 1926 was the highest in the history of the company, also revenue traffic (excepting post-war peak year 1920).

7. Company is relieved of financial responsibility of building and operating city lines and as the city's operator receives compensation commensurate with the magnitude of such operations.

8. The trial term ends in 1936, the city then having right of review and/or termination; likewise every fourth year thereafter. Term of agreement ends 1957.

9. Extensions covered during the trial term relate only to those authorized by referendum, i.e., Broad Street terminals and Walnut-Darby lines; other desired extensions to be included by mutual agreement.

10. *Recommended:* Frankford elevated lease under existing, practical conditions may well stand as it is, separate from the Broad Street agreement, but if by mutual agreement it can be made fully coterminous therewith, including right of review, this should be done so that some minor features may later be clarified. The non-standard track gage and size of cars and the physical connection with Market Street indicate the reasonableness of this course.

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the city high-speed lines to the north and the southwest, which, together with the present Market-Frankford elevated-subway trunk to the west and northeast, furnishes the main axial system of rapid transit. Other extensions and branches are provided for by mutual agreement but may become mandatory on the first date of review, 1936, or succeeding four-year periods.

Transportation at Minimum Cost Is Provided for

This plan, it is believed, will secure: (1) The transportation essential to continued growth at less cost than by any other available plan; (2) public ownership (by necessity rather than choice) and private operation; (3) co-ordinated development with minimum risk to both parties; (4) a saving of 1½ to 2 per cent in fixed charges, and (5) a minimum burden on the taxpayer, resulting from the use of the city's financial reservoir to tide over early deficits later absorbed by growing traffic.

The engineer's estimates based on elaborate riding habit counts of previous years (P.R.T. origin-destination counts), also growth trends and forecasts of population and housing, indicate the Broad Street system under this co-ordinated plan would earn in its first full year, 1929, about $2,500,000 net or 2.8 per cent on its investment, leaving only about a like amount to be paid from taxes for fixed charges, including sinking fund. This return will rise gradually after each stage of new construction, due to increasing traffic, and drop temporarily as each new extension goes into service. By 1936, with an investment about three-fourths greater than initially, after the Walnut-Woodland elevated-subway line to Darby is put into operation, the estimated revenues will about double and the estimated net return on the city's investment will be somewhat greater than in 1929. All of these estimates apply only to co-ordinated operation.

Although differential fares might possibly be justified in the future, the agreement was based upon a fare system uniform with that of the present lines and buses, requiring some adjustment of the company surface lines to provide feeder service. In order to avoid accounting complications, fares on interline riding are to be pooled and split equally, so that the company receives proportionate revenue for its short-haul feeder lines and the city for its high-speed trunk service.

Thus co-ordinated operation becomes an inherent element of the plan. According to the engineer this status is quite different from so-called "unified operation," which most generally results in so complex a situation of "scrambled" capital and operating accounts as to defy reasonable allocation at times of desired resettlements. In this agreement the city's accounts are to be kept entirely separate, likewise the physical property and operations. But to the passenger, the system is completely co-ordinated.

Operator's Compensation Based on Net Earnings

The city lines will bear all of the operating costs and appropriate compensation of all of the personnel required. In addition, some incentive to active traffic development and operating efficiency is embodied in the agreement by a sliding-scale compensation proportionate to the magnitude of operations based upon 3 per cent of the net earnings of the city lines. Here it is to be remembered that the operator as such is relieved of the necessity of financing both construction and operation of city lines. On this point the engineer states:

> The subway will of course affect adversely slower parallel surface lines and activate the crosstown feeder lines. But in view of the evident consideration given by the Public Service Commission to such a probability [undertaking the city lines operation] in sustaining the 7½-8 cent fare, and from my study of available P.R.T. railway statements and other records pertaining to the company's position today, the conclusion appears to me to be justified that, under the present fare, the company should be able to continue the operations of its own lines without financial embarrassment from additional Broad Street subway operation under this agreement. This assumes, of course, normal levels of budget expense operations and of overheads generally current on equally modern systems.

Bearing upon this, it is pointed out that:

> Total riding in 1926 exceeded that of 1925 and with bus traffic exceeded that of any year in the history of the company; likewise revenue traffic excepting only the post war peak of 1920; and passenger revenues, railway and bus, increased nearly $8,000,000 or 18 per cent in the two years following the last fare raise. Thus the net result upon the P.R.T. system under the proposed co-ordinated plan will probably be to sustain the surface system as a whole and at least to avoid the decline thereon which would immediately ensue if the city were forced to resort to full independent operation.

The company, in normal operation, submits annually operating, maintenance and capital budgets and upon the board's approval, Council's authorization of new capital funds is requested, and drafts upon the renewal fund are approved or, in cases of emergency, from other balances as provided for in the agreement.

City's Amortization Policy Recognized

Under the law all construction money must be fully amortized by the city within the 15-30-50 year periods of issue, roughly apportioned to the useful life of the property. The sinking fund payments thus add perhaps one-fourth to normal fixed charges of the major part of the structure, the subway. It is evident, states the engineer, that the city is thus following a very conservative financial policy, especially with regard to the permanent subway structure, in writing off the entire investment within 15 to 50 years, as the case may be. This amortization policy has two great advantages:

> 1. It deliberately retires a good portion of the investment covering building for the future which is necessary in any rapid transit enterprise, due to the nature of the task and the high cost of enlarging to four tracks later.
> 2. It creates a "revolving fund" progressively built up from bond retirements out of which new extensions and major replacements may be made without recapitalization, thus providing a financial "cushion" for readjusting future operations to the current needs, and avoid the entire dependence on new bond issues which might not then be economically feasible (such as during war times). Also to a moderate degree it puts the brake on unwise expansion.

Thus in this Philadelphia situation, while the burden of amortization is unescapable, it is eminently conservative and helpful to the next generation, and the plan has been worked out so that the present taxpayer burden under the law is minimum, adequate renewal of the property is practically guaranteed.

Under the conditions, the amassing of a depreciation reserve fund based upon the useful life of the principal parts of the property is not deemed advisable or necessary by the engineer. Instead, actual "renewal liability" has been provided for, based upon such life but with a much lighter burden on fares and with a reserve fund limited to amounts estimated to be needed to carry the system over its peak years of renewal requirements, plus a reasonable safety factor. This principle of renewal liability as distinguished from accrued depreciation was developed by the engineer in the 1925 fare case for the entire P.R.T. system, recognizing that a large part of any accrued depreciation reserve will never be required

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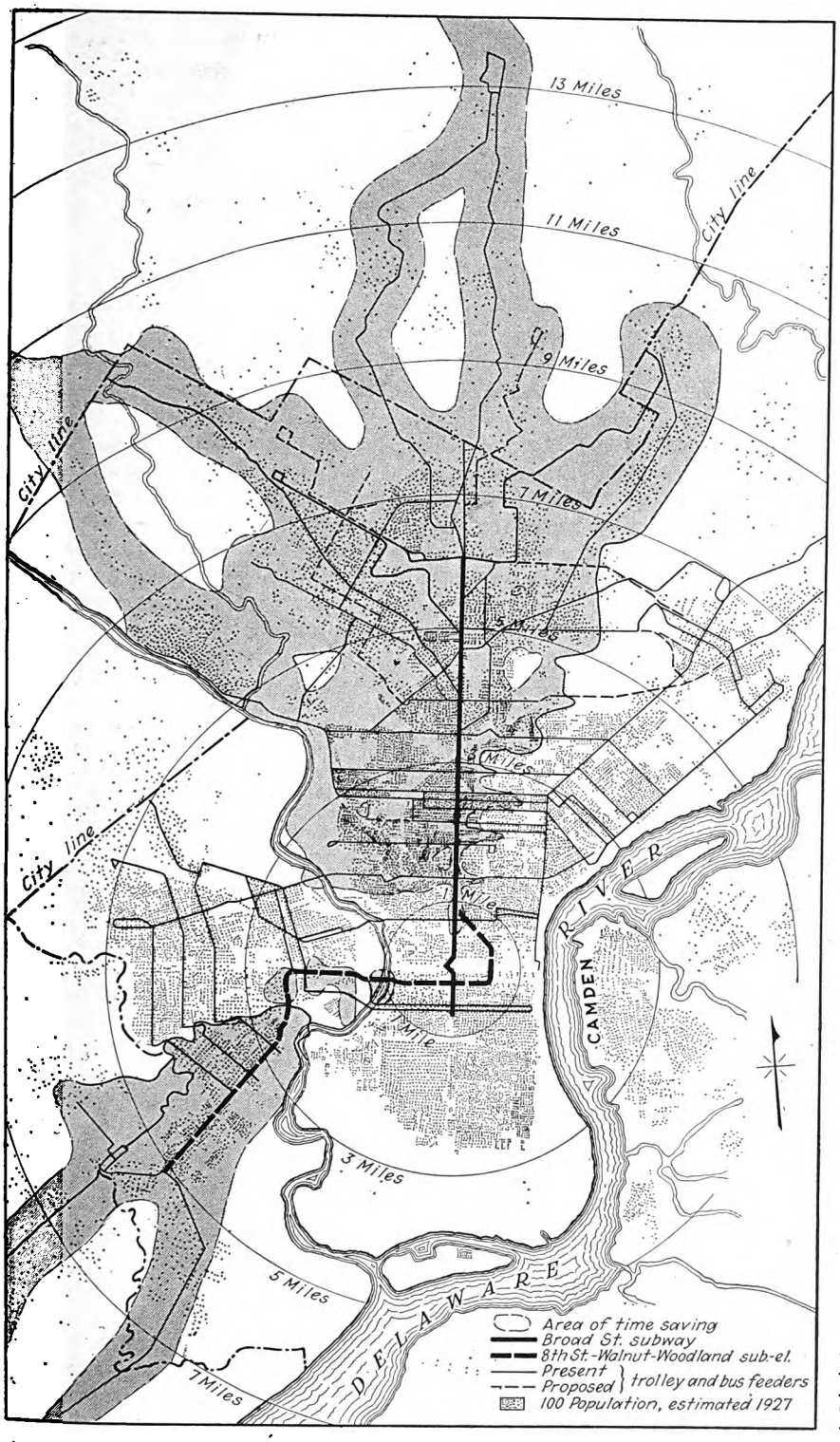

Area within time-saving influence, Philadelphia Broad Street subway and Woodland-Walnut subway-elevated

The time-saving area represents the estimated area in which time will be saved by riding to or from the business district on rapid transit lines (local service) and feeders, as compared with routing on existing railway and bus lines.

The estimated population in 1927 is based on the 1920 census revised to 1927 as indicated by the 1927 school census. The population that is shown outside of the city limits is taken from the 1920 census.

as such because the overlapping renewal maturities of the various parts of the property are spread over long periods of years, and only a small portion matures at any one time. The engineer defines renewal liability to mean:

> Such estimated amounts which in the aggregate will suffice to meet the cost of renewals or replacements or both of any and all depreciable elements of the property as and when actually required, but excluding that portion of accrued depreciation which in the aggregate can never mature as such at any one time, that is the full difference between the cost new and the depreciated value of said property as a whole.

Thus under the agreement rates will carry only actual renewal cost. As the amortization of the entire property is mandatory by law, no justification exists for the double amortization which would result from full accrued depreciation. Until the first bonds mature (fifteen years), renewals will be carried out of revenue. Thereafter, renewals will be refunded so far as necessary. Thus the amortized capital will be "plowed back into the property" as fast as used up in service and ultimately the bonded debt will be progressively reduced.

Local Supervision Considered Essential

A co-operative board of control is recommended by the engineer as a practical safeguard to the city's growing interests, i.e., a co-operative agency appropriately representative of both city and company, to decide promptly the multitude of questions, technical and financial, for which this board is especially qualified. This simply puts into practice the spirit of co-operation voiced in the 1907 city-company contract, but which has heretofore proved somewhat unworkable under its terms. This supervision is not a charter function of the Department of City Transit as now constituted.

Under a guaranteed-rental lease requiring return of the property in proper condition the Board of Control would not be so essential. But with the projected city system advancing so rapidly to a position of preponderant investment interest, and the necessity of current knowledge of revenues and operations, maintenance of physical condition and safety funds therefor, and since the city has elected to take the responsibility for rapid transit development, this technical control, continuous and "at the source," is considered an important step in advance in the Philadelphia situation. In the language of the report and agreement, the board members should be:

> Qualified by training and experience in the operation, accounting, engineering and/or finance of transit systems. In no sense assuming managerial functions, but rather to provide a qualified agency thoroughly informed, technically experienced and continuously active in all matters affecting the operation and financial integrity of the city system.

The company appoints one member, the Mayor appoints the chairman; the Director of Transit sits ex officio, thus tying in effectively the city's construction organization.

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This step is in line with the established policy of the two largest Pennsylvania cities, viz., The "Gas Commission" of the Philadelphia Gas Works ordinance, and the "Conference Board" of the Pittsburgh traction ordinance. This board will keep currently informed, make official determinations and certifications, approve budgets, appropriations and contracts, and recommend on numerous questions continuously arising, thus relieving the city's legislative and executive authorities of all technical details except such as require city action.

City's Stability and Trend Justify Contingent Plan

Heretofore cities seem to have been satisfied to provide construction money simply on guaranteed carrying charges paid by the lessee. As a result, to safeguard against contingencies the lessee drives as hard a bargain as possible, aided by the ghost of operating deficits of the early years. Inevitably the taxpayer foots the bill. But Philadelphia, with its remarkable history of steady growth and industry, stability and diversification, has itself provided the necessary guarantee of safety. Hence this plan, with a return to the city contingent on traffic and revenue, has been designed to release the lessee from the actual or assumed risk necessarily an important factor in any guaranteed rental. Thus relieved, the lessee becomes simply a licensed operator on stated compensation.

The full perspective, the engineer states, must embrace the fact that Philadelphia has alone taken upon itself the duty heretofore assumed largely by private capital as one of the responsibilities of a supervised monopoly, in developing transit in proportion to the needs of the community. The city has developed its best traffic artery, heretofore undeveloped. North Philadelphia as a whole contains more than half the population of the city, and it is estimated that two-thirds the population of this district, more than 700,000 people, reside within the territory served by the zone of influence of the Broad Street subway and its co-ordinated feeders, i.e., within the time-saving zone. Moreover, outlying North Philadelphia is now and since 1900 has been growing fastest in population of any section of the city. This is particularly true since 1920. Underlying all this, Philadelphia has shown itself to possess perhaps the most stable population growth of any American city. While a slight recession is recently in evidence, it is not unreasonable to assume that Philadelphia's broad underlying growth should continue, especially in a community of such fortunate diversified industry.

The Housing Association's coded spot map of dwellings built in 1923 and 1926 gives striking evidence of the concentration around the Broad Street subway, and beyond, reflecting anticipated subway service, likewise the condensation at the end of the Frankford line to the northeast. Not only row houses but even apartments have made their appearance well beyond the north terminal. Thus the subway will at once fulfill a major purpose—high speed and long haul—and very probably will supplant a considerable portion of private automobile traffic.

The potential service possibilities of the city's new high-speed system are here measured by the time saving over present surface car line and bus schedules to the center of the city. Tributary population within the city limits shown by dots on the time-saving zone of influence map is recorded as of 1927. The unshaded areas to the northeast and to the west are already covered by the Market Street-Frankford elevated route. This time saving is based upon surface line and bus feeder schedule operations, allowing suitable period for transfers. It is this time saving in which the surface lines find their most valuable service rather than in long-haul service to the center. While recapture of private automobile traffic now existing has not been, and cannot be, accurately estimated, the engineer believes that much of this long-haul auto traffic will swing over to the subway as central congestion increases.

Benefit Assessment Recommended

The lines here represented are estimated to cost around $89,000,000 complete for the first unit, City Hall North, $120,000,000 including the South and Ridge-Eighth Street extension, and branch, and around $160,000,000 when the Walnut-Woodland subway extension to Darby is completed. Other projected extensions further south, to the northwest and branches to the north will require still other capital in large amounts. The engineer therefore raises the question whether the time has not come for the principle of local benefit assessment to be incorporated in the city's transit financing, pointing out that a joint resolution therefor has already passed two legislatures and awaits referendum for the construction of Pittsburgh systems.

In an economic sense, it is paid-up amortization of the extra development cost of building for the future as well as for the present by contributions from property benefited by the improvement, in proportion to such benefit. By this means the additional burden of fares and taxes from such expensive form of transit construction will be proportionately reduced and the release of city's borrowing power facilitated to maintain the continued growth to which the city is entitled.

Enabling legislation for Philadelphia to provide the necessary legal machinery and safeguard its administration is suggested.

The engineer's report discusses also the various alternative plans of the contract-lease ranging between: (a) A fixed guaranteed rental, and (b) complete independent operation by the city or other operator with city feeders, including compromise independent operations with feeder service, as agreed upon; contingent rental based upon a fraction of the fare; sliding scale guaranteed rental following the net earnings, etc. But while independent operation exists as a possibility and last resort, the engineer strongly recommends the fully co-ordinated plan with uniform fares, exchanges and interline free transfers to feeder lines. In this matter the system will be most completely integrated, the public given the best service and both city and company derive larger revenues than if independent operations were resorted to.

In the final perspective, the proposed operating agreement gives the car rider a uniform 7½-8-cent fare and universal transfers and at the start pays about one-half of the carrying charges, while the taxpayer carries the other half, the company's responsibility for city lines is confined to efficient operation and receives one-half of the interline riding revenue, the city receives what is probably the maximum return under any practical form of lease and saves the public from 1.5 to 2 per cent on the cost of financing. The P.R.T. is permitted to merge into its system a new system of modern high-speed trunk lines, and continue its operations under the 1907 agreement at much less cost than if it had been called upon to build these high-speed lines itself.

A proposed agreement and operating contract is appended to the report and gives in detail the features stated by the engineer as essential in securing the results desired. This was prepared after consultation with the city officials concerned.

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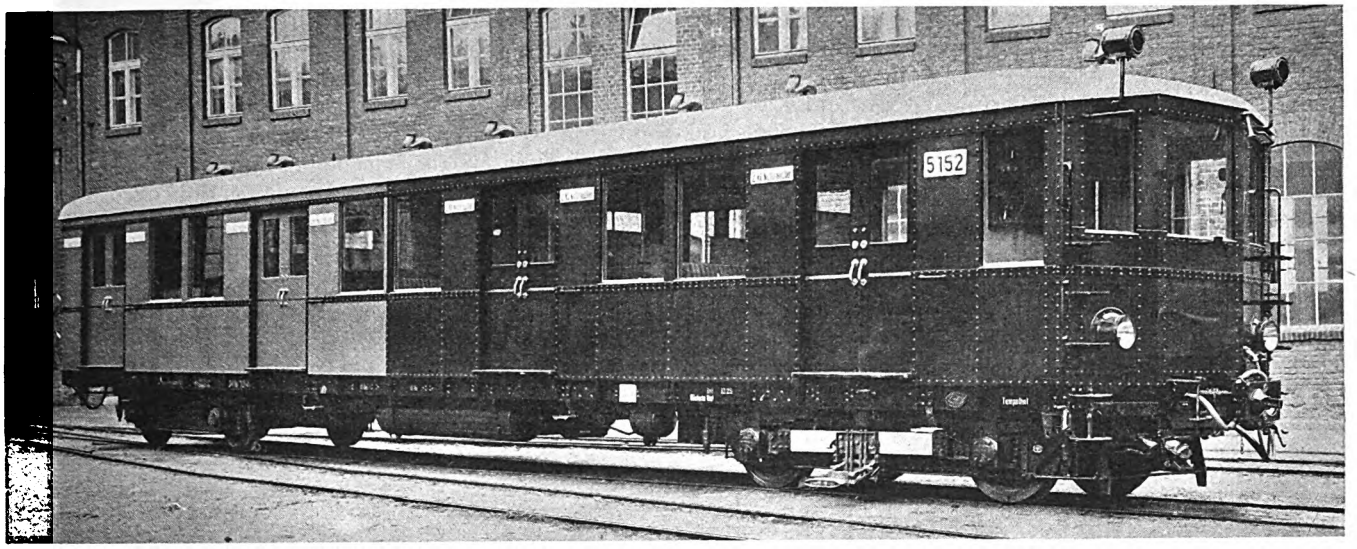


These cars for the electrically equipped Stadtbahn in Berlin have four double sliding doors on each side

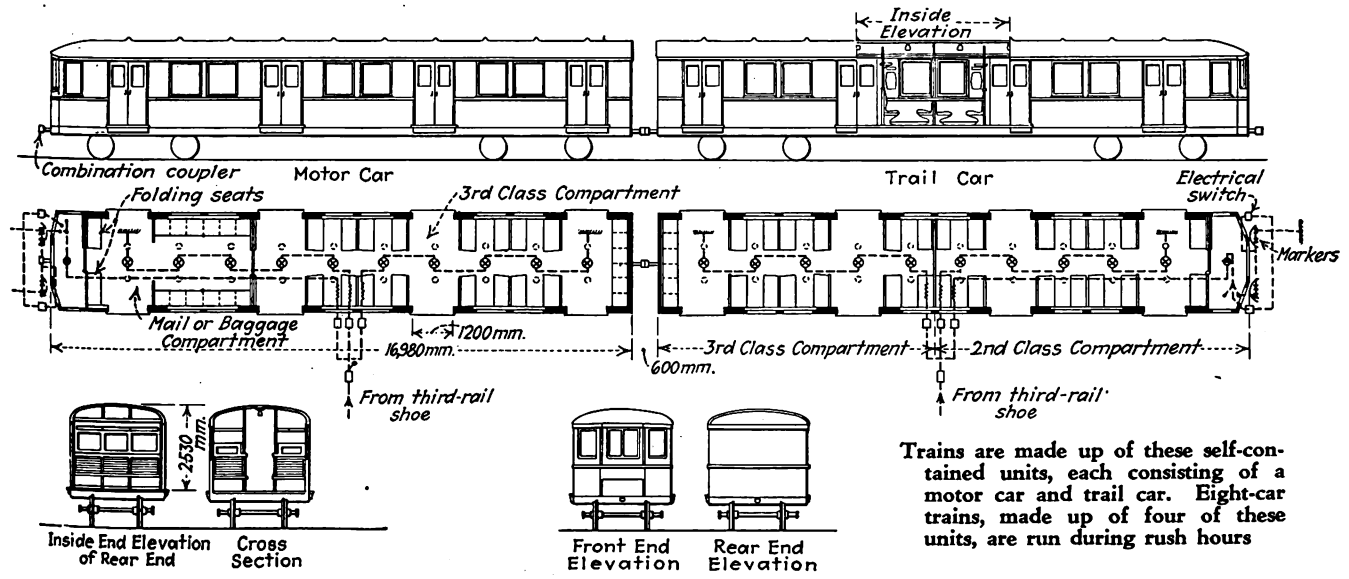
Cars on Berlin Stadtbahn

The design of the cars selected for this rapid transit road, now being electrically equipped, is given in detail. The electrical equipment includes a number of novel features

By Henry W. Blake
Senior Editor ELECTRIC RAILWAY JOURNAL

DESIGN of the car adopted for the Berlin Stadtbahn is of equal interest with the power distribution system with which the same road is equipped. An account of the latter was published in the issue of this paper for Nov. 5. Before making a selection of the type of car the engineers of the German State Railways, the owner of the line, made an extended study of the types used in rapid-transit service. Particular attention was given to the determination of the most desirable arrangement of seats and doors. To help in the decision several experimental cars were built. The results obtained from these samples led to the selection of the present design.

The chief points sought in the new cars were: Largest carrying capacity, especially for rush-hour conditions, within the clearance limits available; rapid rate



Trains are made up of these self-contained units, each consisting of a motor car and trail car. Eight-car trains, made up of four of these units, are run during rush hours

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of passenger interchange to reduce the length of station stops; easy subdivision of the train, so that its length could be varied according to the traffic demand; short distance between station platform and car floor.

Cars are now being built according to the final design by a number of different car builders. The halftone engraving at the beginning of this article shows the exterior of one of the cars built by the Waggon & Maschinenbau A. G. of Görlitz. The accompanying line drawing shows a motor car and trailer being built by the Orenstein & Koppel Company of Berlin. These two cars are of the same length, and in operation a motor and trailer are permanently connected together to form a two-car train. Such a train can be run by itself, or in combination with other similar groups of two cars to make a four-car, six-car or eight-car train.

The eight-car train would consist of four motor cars and four trailers and would have a total length of 140 m. (460 ft.). This is the longest train that can be accommodated at the present station platforms.

As will be seen from the plan, the outer or free end of the motor car has a motorman's compartment extending the entire width of the car. Directly to the rear of this compartment is a section about 4.7 m. (15 ft. 5 in.) in length, separated from the rest of the car by a sliding door. This section has two double cross seats and four double longitudinal seats, all of which can be raised, so that mail and baggage can be carried in this section, if necessary. At the rear of this section is another with cross seats for 38 third-class passengers. All the seats in the trail car are transverse, but the car is divided by a bulkhead into two compartments, one for third-class and one for second-class passengers. In each complete "quarter train" there are upholstered seats for 28 second-class passengers and slat seats for 84 third-class passengers. Besides these seats there is a large amount of room for standing passengers.

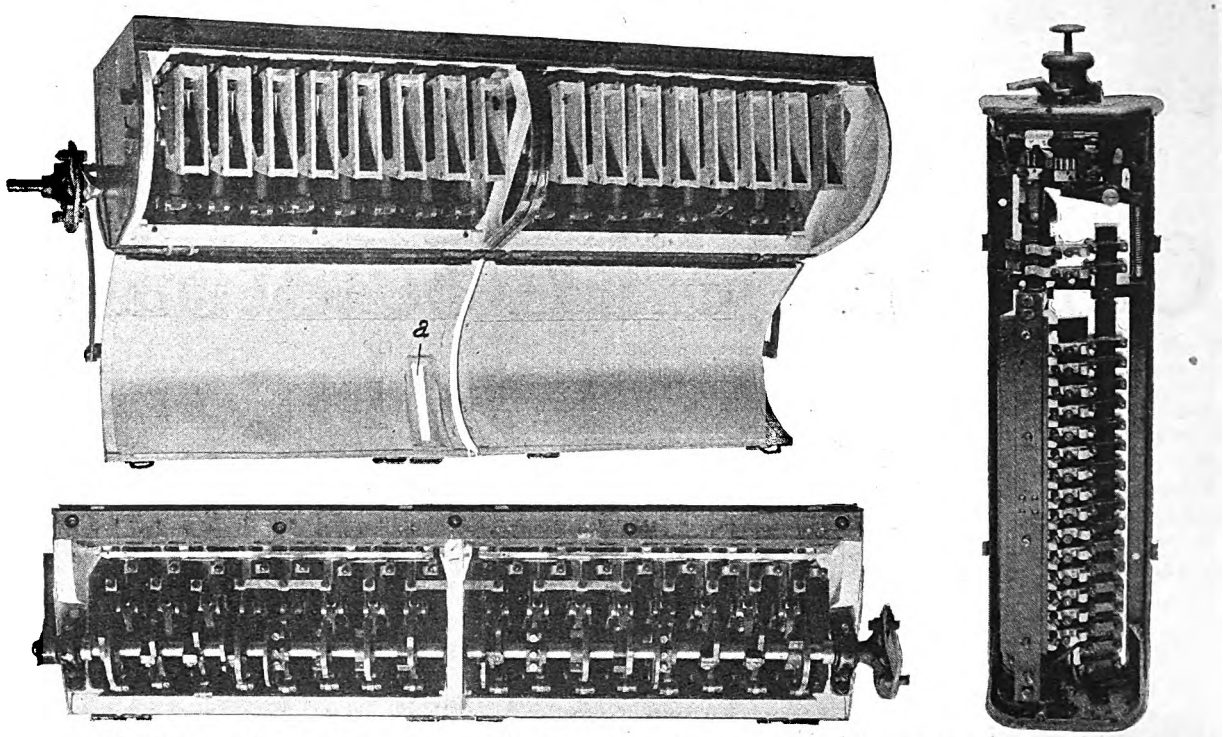
As is common on local lines in Germany there are no so-called first-class compartments. Tickets are sold only for second and third-class accommodations.

The weight of the car bodies has been kept low by the use of silicon steel and simplification of design, so that an entire train of eight cars weighs about 248 metric tons (545,600 lb.). Still further reduction in weight is hoped for following the use of aluminum alloy. Such a train would carry in rush hours an average load of about 1,000 persons, making the weight of train with load about 320 metric tons (704,000 lb.).

On each side of each car are four double sliding doors, each 1,200 mm. (47¼ in.) wide. The large side windows are counterbalanced and they can be opened for one-half of their height. The flooring is covered with fireproof cement. Electric lighting is provided in each car by three circuits of five lamps in dome fixtures, which give a good light distribution without a dazzling effect. Each car is equipped with fifteen electric heaters, wound for 750 volts and 750 watts, and arranged under the seats. In each motorman's cab is a fire extinguisher and a Krupp typhone signal whistle.

The couplings are of the automatic combination type and provide for air connections. Later the electrical connections will probably be included in the couplers. The trucks have a wheelbase of 2,500 mm. (8 ft. 2½ in.) with wheels of 900 mm. (35½ in.) diameter. Air brakes of the variable-load type are used. The management says that it plans to use brake shoes of wood or similar material to avoid generation on the road of iron dust which may get into the motors.

Considerable study was given to the question of equipment. In the early tests each motor car was equipped



At left, two views of the car controller from opposite sides. At right, master controller

In the car controller "a" indicates an opening under the load switch.

In the master controller the starting knob on top is arranged like a deadman's handle. The small lever below is a selective switch for varying the rate of acceleration and for changing from forward to backward operation.

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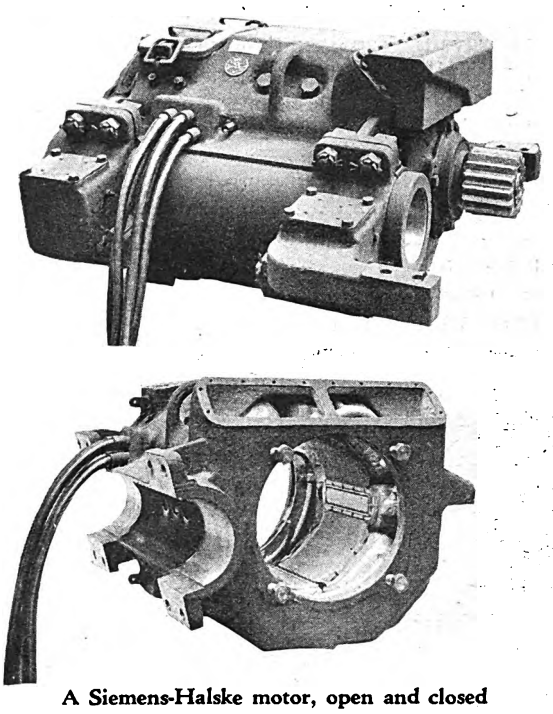
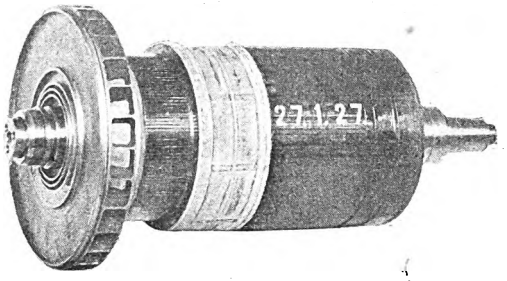
with two 750-volt motors, each having a capacity of 170 kw. at 630 r.p.m. on the hourly rating. These motors weighed about 3 metric tons each and both were mounted on the outer truck of the motor car. Later, this type of equipment was abandoned for a four-motor equipment for each motor car, each motor being wound for 375 volts, the two on each truck being connected permanently in series. Each of these motors at 800 r.p.m. has a rating of 90 kw. on the hourly basis and of about 56 kw. on the continuous basis and weighs with casings 1.66 metric tons (3,660 lb.). The decision in favor of four instead of two motors per motor car was because they provide greater tractive effort and permit the use of smaller diameter wheels (1,000 mm., or 39.4 in., in the original design and 900 mm., or 35½ in., in the latest cars). Smaller wheels, in turn, permitted somewhat more freedom in body design. The lower voltage was adopted because it was expected to simplify the design of the motors and lessen their maintenance. While it reduces somewhat the number of economical running positions, those possible with 375-volt motors are considered sufficient.

The motors are mounted by nose suspension and are connected to the axles through gearing having a reduction of 67 to 17.

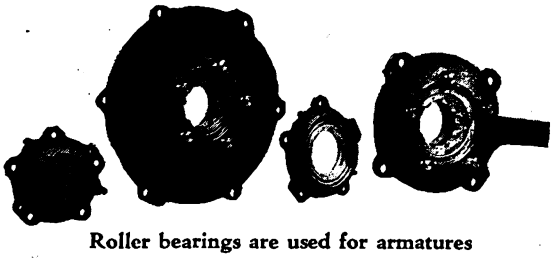
The motor order was divided among the A.E.G. Brown-Boveri and Siemens-Schuckert. One of the views shows a motor of the Siemens-Schuckert Company with and without armature. In this view the straight line suspension of the gear case by brackets from the motor frame will be noticed, as will also the method of inclosing the axle between bearings. Another view shows a ventilated armature of the A.E.G. make. Its most striking feature, to an American, is the attachment of the fan at the commutator end of the armature shaft instead of at the pinion end. All armatures have roller bearings. The efficiency of the motors including gearing is 88 per cent.



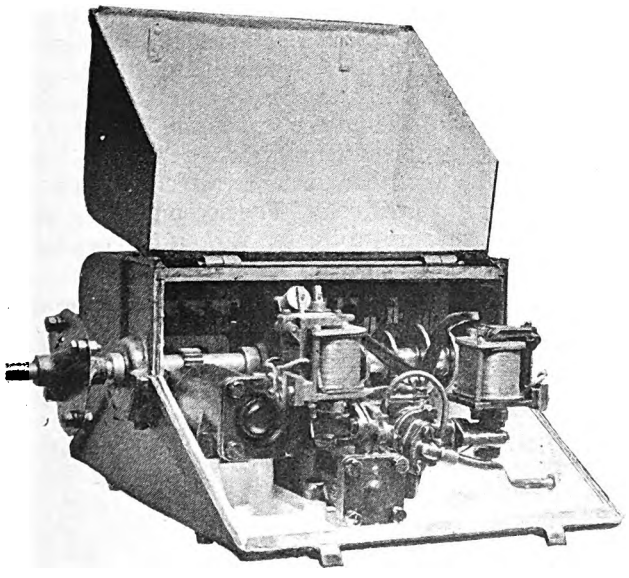
A Siemens-Halske motor, open and closed



Armature for an A.E.G. ventilated railway motor. Note the fan is at the commutator end of the shaft



Roller bearings are used for armatures



Electro-pneumatic mechanism for operating car controller

Electro-pneumatic control is used. The two groups of motors are connected in series and in parallel by the bridging method. The car controller (illustrated in one of the views) performs the function of the switch group used in corresponding control equipment in the United States. In this controller the contacts are closed and opened by the movements of rollers bearing against eccentrically shaped disks, similar to the cam controller used in the United States. For safety, the circuit is kept closed also by the action of the roller on the disk. The contact is opened by a spring. Each contact has its own magnetic blowout. The one under the opening marked *a* in the controller view is a so-called load switch, which provides the necessary bridging connection for changing from series to parallel.

The shaft of the car controller is rotated by the action on a ratchet wheel of a pawl pneumatically operated and electrically controlled. The mechanism at the end of the controller shaft for doing this is shown in an accompanying view, though the ratchet wheel is hidden behind the rest of the mechanism.

The entire train control is automatic. The motorman starts the train by pressing down the button of the master controller, shown on the opposite page. Further notching up from point to point follows automatically in the switch relays when the motor current has fallen

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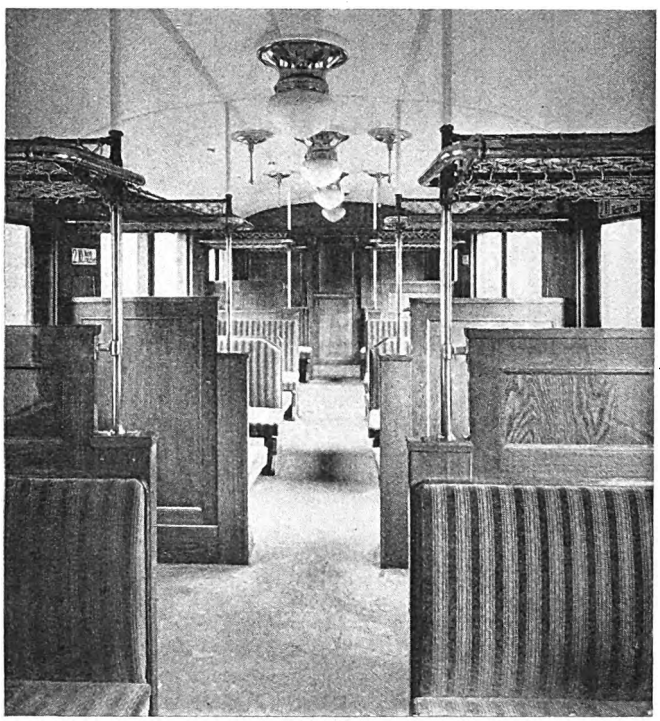
to the predetermined value. The current taken at starting is always the same, so that overloading of the motors is not possible. The two motors connected permanently in series pick up current in the same way as if they were connected in parallel. For example, if an average acceleration of 0.5 m. per second per second (1.12 m.p.h.p.s.) is required, the acceleration in the series position would be 0.8 m. per second per second (1.78 m.p.h.p.s.) and 0.36 m. per second per second (0.8 m.p.h.p.s.) in the parallel position.

If the motorman should take his hand off the knob, or a deadman's handle, all power is cut off the train. With the so-called selective switch, shown in the view of the master controller, the motorman can determine the average starting acceleration. For example, he can select 0.67 m.p.h.p.s. in suburban operation and 1.12 m.p.h.p.s. in the city. This same switch can also be used for changing from forward to backward movement.



Dome lighting is used and the seats in the second-class compartments are upholstered

Further apparatus in the control equipment includes the following: (1) A direction reverser with two compressed air cylinders and magnetic control, (2) a no-voltage protective relay, whose magnet coil is directly connected to the main circuit from the third rail shoe, shuts off all control apparatus from the car if the current collector loses voltage, (3) a series overload relay for the motor circuit which operates when the motor current reaches too great an amount, and (4) a switch by which it is possible to cut out a single car. The controller has special contacts for the heating circuit and the circuit for the compressor motors.

While the Stadtbahn is being electrically equipped, the opportunity is being taken to install some other apparatus whose use will be extended to all sections as rapidly as possible even while steam locomotives are being used. One of these is an automatic signal system which is being put in by the Siemens-Halske Company. The cables for this system are being laid at the side of the track in a trough which is covered with asphalt and can then be used for a walk-way. An automatic stop will be used in connection with the signal system.

The platforms at all stations are being raised to the height of the car floors.

An electrical repair shop is under construction. Associated with it will be housing accommodations for the employees.

Increased Capacity Will Follow Electrical Equipment

The maximum number of trains which can be run on the Stadtbahn at present with the existing steam service is 24 per hour. These trains have a carrying capacity for passengers seated and standing of about 27,200. On the Ringbahn, on account of the limitations of the stations, the capacity with steam power is only about twelve trains an hour, representing about 12,400 seating and standing passengers.

Electrical operation on the Stadtbahn means an increase from 24 to 40 trains per hour, or 67 per cent, and on the Ringbahn from twelve to 24 trains, or 100 per cent. Moreover, the electrically equipped trains on the Stadtbahn will carry 40 per cent and on the Ringbahn 55 per cent more passengers, so that the net result on the former is to make its capacity 2.34 times and on the latter make three times the present steam service. The running time will be improved by about 25 per cent. On the suburban sections a corresponding gain is secured.

Formerly, the only way of reducing total train capacity in the hours of light traffic was by increasing the headway. Now it is possible to meet this condition by decreasing the length of the trains, so that the headway used need not be lengthened. This means better service. A saving in man-power for operating the trains is also expected.

The only question which remains to be considered is that of the way of handling the through steam trains which will still use part of the Stadtbahn to reach their terminals or to pass through the city. The present plan is to haul these trains by electric locomotives, and a sample locomotive is being built for this purpose at the Siemens-Schuckert works.

Detroit Accident Record Improving

FURTHER decrease in accidents is seen on the lines of the Detroit Department of Street Railways for the month of October, 1927, as contrasted with the corresponding month of 1926, according to Del A. Smith, general manager of the property. The reduction is from 1,624 to 1,084 for the system, or 33.2 per cent. This he attributes to the low labor turnover, which at the present time is less than 0.5 per cent. The accompanying tabulation gives the comparison for the various divisions.

COMPARATIVE ACCIDENT RECORDS 1927–1926, DETROIT DEPARTMENT OF STREET RAILWAYS

Division	Total 1927	Accidents 1926	Per Cent Decrease
Trumbull	48	112	57.1
Woodward	89	154	42.2
Baker	90	147	38.8
Shoemaker	115	187	38.5
Fort	128	206	37.9
Gratiot	157	240	34.6
*East Coach	53	76	30.3
Fourteenth	164	233	29.6
Jefferson	123	163	24.5
*West Coach	117	106	†10.4
Total	1,084	1,624	33.2

*Coach record for October, 1927, compared with September, 1927.
†Indicates increase.

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Rapid Transit Railways

Now Serve Sydney, Australia

The six-track main line passing Central Station will cross this viaduct

SYDNEY, New South Wales, Australia, will have one of the most complete rapid transit electric railway systems in the world when lines under construction and proposed extensions are completed, according to an article in *Engineering News-Record*. The system, the first part of which was opened in December, 1926, will include underground lines in the business district and surface lines connecting with the suburban railways. The lines will extend across the great 1,650-ft. cantilever bridge now being built over the harbor, to connect with lines in North Sydney. Part of the line, that passing the Central Terminal Station, is to be elevated. The viaduct which will carry this six-track main line is shown in the illustration on this page.

From the four-track main line railway entering Sydney from the south suburban traffic will be diverted at Redfern by the eight-track city railway, paralleling the former as far as the Central Terminal Station, as shown on the map. Beyond the Central local station six tracks go underground to the Wynyard station, whence four high-level tracks will extend across the new bridge, while the two low-level tracks loop around the business district and return to the Central local station. Proposed extensions include: (1) An inner loop, *A*, serving an eastern suburban line; (2) a second connection, *B-B*, between Wynyard and Redfern for bridge trains, and (3) western and southern suburban extensions *C* and *D*. In North Sydney the line will connect with the existing railway now isolated, while additional lines in that section are planned.

From Redfern the round-trip route by the city loop is 5.5 miles, with 18 miles of track. From the Central station the round trip of 3.6 miles is to be made in 11½ minutes. On the portion now in operation, Central to St. James, the run is made in 2½ minutes, which is said to be about the time otherwise required to leave the train at the Central Terminal and board a downtown street car. The longest distance between stations will be less than a mile.

Many features enter into the construction and arrangement of the crossings, underground lines, tracks and stations of the system. Among these are the numerous "flyover" crossings which separate the grades at the track intersections. A special layout of this kind is required in the south approach to the Central local station, since the arrangement of eight tracks for northbound and southbound trains alternately is here changed to alternate pairs, so that each of the four island platforms is served by trains in one direction only. As these tracks are assigned to specific routes, the connections and grades are complicated; in fact, this is said to be the largest crossing of the kind in the world, having fourteen flyovers separated by two crossings at grade, but used only by trains in the same direction. Part of this crossing is shown in one of the illustrations, with high-level tracks on each side of the roadbed for depressed track.

On the underground portions of the route twin single-track tunnels are driven for the different double-track lines. At the Goulbourn Street portal there are six tun-

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the station as shown on the map on page 986. This station is 108 ft. wide, with 28-ft. platforms 520 ft. long. Each platform has one 12-ft. stairway for descending passengers and two 6-ft. stairways for ascending passengers. These stairways open from a concourse 108 ft. square 16½ ft. above the platform and 16 to 18 ft. high, having subway ramps to the streets. The Museum station, for two tracks, is 48 ft. wide with an arched roof over the tracks and two 12½-ft. side platforms. Here the rails are about 45 ft. below the surface. Long inclined subways or ramps, with steps at intervals, connect with the streets. Interior walls are lined to a height of 8 ft. with cream colored glazed tile having moldings of different colors. Above this the concrete is given a hard, dense surface by spraying it with two coats of mill-white water paint. All stairways have 12-in. treads and 6-in. risers and the maximum height for any flight is 8½ ft. Illumination in the underground stations has an intensity of 4 foot-candles on a plane 3 ft. above the platform. As a result of this brilliant lighting favorable contracts have been let for the advertising spaces on the walls. Two circuits provide against entire failure of the lights. The illustration of this station shows the excellent lighting.

The railway was designed and built under the direction of J. J. C. Bradfield, chief engineer of the Metropolitan Railway and Sydney Harbor Bridge. R. J. Boyd is principal designing engineer, W. Farrow supervisor of construction, K. A. Fraser and A. Humphries resident engineers and M. Myers chief electrical engineer.

Promoters of Beautiful Stations Win Awards

FALL inspection of stations of the Illinois Power & Light Company, Chicago, Ill., for the award of 1927 prizes to winners in the station beautification and neatness contest has been completed by the committee appointed by D. W. Snyder, Jr., vice-president.

On the main line the winners are as follows:

Southern division—Gillespie, first; Anderson substation, second; Virden substation, third. Central division—Forsyth, first; Bondville, second; Harristown, third. Eastern division—Fithian, first; Homer, second; Ridge Farm, third. Northern division—Mindale, first; Union, second; Morton, third. On the Illinois Valley division the winners were as follows; Ottawa shops, first; Minooka, second; Seneca, third.

As a reward for appearance of the several stations, prizes were allotted to the winners in each division to the amount of $35 for first, $25 for second and $15 for third.

Because of the excellence of the winners of first place in all four divisions of the main line the grand prize of $65 offered for the best developed station and grounds was divided between the four winners—Gillespie, Forsyth, Fithian and Mindale.

Many of these stations were so carefully cared for that they were indeed beauty spots along the Illinois Traction System lines. The care, time and work given to the beautification effort by the station and substation attendants were responsible for the results attained. Throughout the territory adverse weather conditions made the work of growing flowers, shrubs and grass exceedingly difficult, but those in charge of stations succeeded in spite of these handicaps.

In addition to the prize winners there were many other stations and grounds that showed the result of work and care.

Numbered Route Signs Used in Milwaukee

NUMBERING of street car routes, and providing illuminated numbered signs on its cars, is an innovation being carried out by the Milwaukee Electric Railway & Light Company. The numerals are 8 in. high, and are placed in boxes which are 15 in. square. They occupy a position on the front left-hand top of the car roof, which will demand attention. Beneath the number, on the same sign, appears the name of the route in

Car of the Milwaukee Electric Railway & Light Company with new sign arrangement

smaller lettering. The entire sign is illuminated at night, so that the numerals can be read easily.

The oblong illuminated roller sign on the cars will be used to indicate destination only. In addition, colored illuminated boarding signs, similar to those used on one-man safety cars, will be placed on all types of equipment.

Single-end rear-entrance cars will bear the message "Rear Entrance" on blue glass. Double-end cars will carry the sign "Enter at the Front or Center" on amber glass, and signs for the center-entrance type cars will read "Center Entrance" on red glass. On one-man cars a "Front Entrance" sign will appear on green glass.

It is expected that riders will memorize the route numbers and refer to them rather than to the route name. As the numbers are of large size, greater visibility of the numerals will tend to facilitate operation, particularly at night, on streets where more than one line passes. Motor buses operated by the company will have similar route signs, and a city and suburban transportation map showing all the lines with their route numbers will be distributed to the public.

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Valuation of Louisville Railway Has Novel Features

Report on cost of reproduction of the Louisville Railway recently made by the Beeler Organization uses latest Supreme Court decision as basis. Perpetual inventory method is recommended

SEVERAL points of interest are raised in the valuation of the Louisville Railway which recently was presented to Mayor Joseph T. O'Neal and the Board of Public Works of the city of Louisville. The report was prepared by the Beeler Organization of New York under the supervision of John A. Beeler, director, and Harold H. Dunn, associate engineer. Chief among the points covered are the method of determining depreciation, the determination of overheads and the continuous inventory system recommended.

The total valuation of the property, as given in Table I, was $28,393,734, which represents the reproduction cost new as of Dec. 31, 1926. From this is subtracted depreciation amounting to $3,944,952, leaving a net "sound value" of $24,448,782.

In addition to this property which is used and useful in railway operation, the engineer gave detailed reproduction costs on property not used and useful, totaling $1,138,714, from which depreciation of $498,125 was deducted, leaving a sound value of $640,589. These values were all determined, states the engineer, by taking an actual inventory of the property, appraising the used and useful property on a cost-to-reproduce basis, analyzing and establishing in detail units of value for each inventory item, showing the cost of labor, materials and equipment as of Dec. 31, 1926.

In pricing the physical property as determined by the inventory, attention was given to the method of construction. On this point the engineer makes the following statement:

> Construction cost is dependent in a considerable measure on the construction program. In our judgment the greatest economy in the construction of this plant would be attained in a program extending over a period of two years, except as regards the Campbell Street power plant. As a source of power during peak load and as a reserve plant, this unit would not be needed as soon as the High Street plant, which cares for the normal loads. The construction of the reserve plant, therefore, could be started somewhat later than High Street, and it should be completed within the six months following completion of the remainder of the railway property.
>
> Power plants, substations, carhouses, miscellaneous buildings and underground conduits could, without doubt, be built more expeditiously and economically under contract, for the railway would not care to perpetuate organizations brought together for this purpose, nor would it continue to have need for such construction equipment. The remainder of the property with the possible exception of grading and paving could be constructed advantageously by railway company organizations.
>
> Under either plan of construction, however, there would be incidental expenses in addition to the bare cost of materials and labor. Such incidental expenses include construction office expense, including time keeping, cost keeping, watching and guarding, the cost of storage sheds, scaffolding, temporary piping and wiring, temporary tracks and equipment, the wear and tear on construction machinery, delays, loss and waste in construction, inspection and testing locally and at manufacturers' plants to make sure that specifications and guarantees are being satisfied, the expense of preparing plant units for operation and adapting them to operating conditions, and contractors' bonds and liability insurance. These and kindred expenses would be covered in a contractors' bid or estimate, and they would be just as real and necessary a part of the cost of construction of the plant as if it was built by the company's own construction organization. In addition, a contractor would add a certain amount as his profit, but in close bidding this would be reduced to a minimum.
>
> Certain of the unit prices, therefore, which have been used are such prices as would reasonably be named by a competent contractor if he were seeking the contract in competition with others. In other cases where the unit prices represent the bare cost of material and labor, certain allowances have been made to cover the miscellaneous construction expenses defined above. The following per cent allowances on material and labor, which in our judgment are reasonable, have been made and are distributed through the appraisal of certain classes of construction.
>
> *Buildings*—15 per cent, including architects' fees plus 2 per cent for liability insurance.
>
> *Power plant and substation equipment*—5 per cent.
>
> *Rolling stock*—an item of general expense has been included in the unit cost to cover inspection, a small amount of engineering, preparation for service and adaptation to operating conditions.
>
> *Land*—none.
>
> *Shop, roadway, office and miscellaneous equipment*—none.
>
> *All other construction accounts*—10 per cent.

Depreciation Considered in Detail

Careful consideration of the depreciation of the property was given in order to arrive at the present sound value. The courts consistently hold, states the engineer, that it is the duty of a public utility company to maintain its property through repair, maintenance and renewal of parts so that as one composite instrument of service it will remain in the maximum economic condition and so that the integrity of the investment shall be maintained. It is held that if this duty is fully performed, the property as a whole has not depreciated, but that depreciation has taken place and should be deducted in such measure as this duty has not been fulfilled. On the other hand, it is inevitable that any property which has been operating throughout a long period of years will include many units which have ceased to perform the functions they were originally built for, or perform some less efficiently.

While the courts recognize the necessity of accumulating a reserve on the basis of depreciation calculations, or, more properly speaking, retirement calculations founded on age and life data, they do not regard this amount as properly deductible from reproduction cost in the determination of the present fair value of a public utility property. Even a property in 100 per cent operating condition would undoubtedly show evidences of depreciation as measured by its remaining years of usefulness. The test used by the courts is to determine in what measure the property has not been maintained to the maximum standard or is incapable of rendering maximum service.

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*Card No.*_____ *Account No.*_____
*Article*_____
*Location*_____
*Installed*_____ *Auth. No.*_____
*Depreciation Rate*_____ *Cost in Place*_____
*Description*_____

Type of small unit card recommended for first system of perpetual inventory

With these considerations in mind, the engineer made estimates of loss of value, which have been summarized by I.C.C. accounts, and the reproduction cost new less depreciation was calculated therefrom. These summarized accounts are also given in Table I.

Determination of Overheads

In general the overheads are determined in the manner ordinarily used in making valuations of public utility properties. The principal concern in matters along this line is the determination of going concern value. This determination, states the engineer, is based on the decision handed down on Nov. 22, 1926, by the United States Supreme Court in the McCardle, et al. vs. Indianapolis Water Company, which is:

> The decision of this court declares: "That there is an element of value in an assembled and established plant, doing business and earning money, over one not thus advanced, is self-evident. This element of value is a property right, and should be considered in determining the value of the property, upon which the owner has a right to take a fair return when the same is privately owned although dedicated to public use."

It is pointed out that a great deal of the prosperity of the city of Louisville is due to the Louisville Railway. Public transportation is a prime necessity in all live communities, and the Louisville Railway's 184 miles of track, serving practically every section of the city, have been built up from a modest beginning by extension into hitherto undeveloped or partially developed sections. The process of building the lines up beyond the central confines and making possible the distribution of the population over the 40 square miles now under service has been accomplished slowly and at considerable expense. The company has also created out of a number of more or less loosely organized street car lines one unified and comprehensive system with the supersession of property incident thereto, and it has built up a trained and skilled personnel and accumulated records enabling it to operate more efficiently.

The cost of this development from a mere physical property to a going concern with an established routine and an attached business represents an element of intangible value termed "going concern value." Whereas this historical development has required many years, the development of this great producing property from the collection of physical property units described in the inventory to a going concern with a trained personnel, accumulated records and operating routine and an established business would require a relatively short period and would not be determined on the basis of its historical development cost. After a careful study of this system and the conditions surrounding its operation, states the engineer, the foregoing cost is estimated to be $1,775,000, which in his opinion represents the going concern value of this property on the reproduction cost basis.

Continuous Inventory System

Besides making the inventory, the engineer prepared a plan for a continuous inventory and appraisal of the property so that the valuation may be kept up to date. The first requisite for such a system, it is stated, is an inventory and appraisal worthy of perpetuation and in such form that it can be set up in a manner permitting its continuance. This basic appraisal may be set up in any one of three forms—a loose-leaf book system, a vertical card system, or a visible card system. In the latter the cards are filed horizontally in drawers, all the cards in each drawer being visible at a glance. It has certain advantages over the other systems, but any of the three serve the purpose admirably.

Two types of cards will be required, the unit card covering individual property units, such as a generator, a pump or an automobile, and the multiple-unit card covering such groups of property units as rails, ties, poles, wire and pipe. If a vertical system employing small cards is used, the unit card may be about as shown in the illustration. Additions and retirements may be recorded on the back of the card, which may be ruled so as to provide columns for a description of the work, the authorization number and date of completion, and the cost of each addition with the total cost up to the last date.

If the larger visible index card or loose-leaf book system is used, a form similar to the one shown for the purpose may be used. It will be noted that this card covers both basic appraisal and additions or retirements on its face. Facing this may be another card or page covering depreciation and showing the progress of the property item toward retirement.

The multiple unit cards and the visible index system may be of the same form as described above and the face of the cards in the vertical index system may also be the same as the unit cards. The back of the vertical

*Card No.*_____ *Item*_____ *Account No.*_____
*Location*_____

Line	Auth. No.	Date of Compl'n	Description	Type & Size	Quantity	Unit	Cost this Item in Place Unit Cost	Cost this Item in Place Total Cost	Total Cost to Date	Acct. No.
1										
11										
12										

Card form recommended for perpetual inventory by visible system or loose-leaf book system

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TABLE I—REPRODUCTION COST NEW AND OBSERVED DEPRECIATION PROPERTY USED AND USEFUL IN RAILWAY OPERATION, LOUISVILLE RAILWAY

As of Dec. 31, 1926

Acct. No.	Item	Reproduction Cost, New	Depreciation	Sound Value
501	Engineering and superintendence	$748,875	$57,697	$691,178
502	Right-of-way	94,683	.....	94,683
503	Other land used	704,410	.....	704,410
504	Grading	376,923	30,547	346,376
505	Ballast	1,320,281	106,057	1,214,224
506	Ties	665,617	118,811	546,806
507	Rails, rail fastenings and joints	2,183,174	261,980	1,921,194
508	Special work	939,773	169,159	770,614
510	Track and roadway labor	1,870,880	172,596	1,698,284
511	Paving	1,219,898	129,287	1,090,611
512	Roadway machinery and tools	55,625	13,906	41,719
515	Bridges, trestles and culverts	26,199	1,310	24,889
516	Crossings, fences and signs	107,736	21,547	86,189
517	Signals and interlocking apparatus	9,546	477	9,069
518	Telephone and telegraph lines	3,218	804	2,414
519	Poles and fixtures	204,775	40,955	163,820
520	Underground conduit	466,523	.....	466,523
521	Distribution system	722,232	57,780	664,452
523	Shops and carhouses	1,386,754	137,034	1,249,720
524	Stations, miscellaneous buildings and structures	135,371	25,459	109,912
530	Passenger and combination cars	2,861,690	943,523	1,918,167
532	Service equipment	204,210	77,334	126,876
533	Electrical equipment of cars	1,749,540	260,963	1,488,577
536	Shop equipment	142,550	35,637	106,913
537	Furniture and fixtures	48,293	7,244	41,049
538	Miscellaneous equipment	72,950	16,522	56,428
539	Power plant buildings	1,834,934	425,459	1,409,475
540	Substation buildings	85,730	8,573	77,157
542	Power plant equipment	2,486,349	771,975	1,714,374
543	Substation equipment	235,447	23,544	211,903
544	Transmission system	263,855	28,772	235,083
545	Franchises	24,425	.....	24,425
546	Law expenditures	112,396	.....	112,396
547	Interest during construction	1,723,765	.....	1,723,765
548	Injuries and damages	268,362	.....	268,362
549	Taxes	198,600	.....	198,600
550	Miscellaneous	418,105	.....	418,105
411	Materials and supplies	375,290	.....	375,290
	Working capital	269,750	.....	269,750
	Total	$26,618,734	$3,944,952	$22,673,782
	Going concern value	1,775,000	.....	1,775,000
	Grand total	$28,393,734	$3,944,952	$24,448,782

cards, however, should be modified by substituting for "description of work" the heading "number of articles—this item and total to date." A summary card for each account may also be included in the system. This will permit of quickly summing up the total property value.

This work should be carried out by a valuation department in charge of a valuation engineer. In order to keep the appraisal up to date, this department must be fully informed of all changes in the property not only as they occur but as each change is authorized. Such an estimate on a suitable form showing a description of the work and estimated total cost with the amount chargeable to property retired, the amount chargeable to operating account and the net addition to capital account should accompany or be made a part of the authorization form.

After approval of the request for authority by the designated official, the completed authorization form or a separate work order form should be sent to the accounting department, the valuation department and the department charged with responsibility for executing the work. During the progress of the work, the purchases, payroll, storehouse and other charges against the particular authorization number will be accumulating in the accounting department, and on completion of the work a complete record of cost will be available there. A summary of quantities and costs may then be made by the valuation department and from this summary the inventory and appraisal cards may be brought up to date.

Renewal of such property items as occasional poles, trolley and transmission wire, hangers, and rails chargeable to operating expense present somewhat greater difficulty. Such equipment, materials and supplies are charged out of the storerooms and yards and installed under the direction of a foreman, whose daily reports together with storeroom records can be made to show the nature, location and cost of such changes. The routine for apprising the valuation department of such changes can best be worked out by consultation between the valuation engineer and the various department heads. The installation of such a system serves not only to keep the description of the utility's property up to date, but furnishes a valuable check on the use of materials.

Signs That Promote Safety in El Paso, Tex.

FOUR of the signs which it has found particularly effective in promoting safety are reproduced by the El Paso Electric Company in its brief for the 1927 Coffin Prize. The first illustrated is placed at every dangerous street intersection in the system and about 100 ft. from the car track. It bears the warning "Slow Down—Car Line" in bold letters. As a warning to automobilists it has proved effective.

The second view shows the way in which the back panels of platform folding doors are marked with the word "stop." This word is on a metal sign which is exposed to view when the door is open to permit passengers to board and leave the car. The third sign is that carried above the bumper on a number of double-truck cars that have a wider swing at curves than the single-truck Birneys used on the same routes. The sign reads, "Please do not try to pass this car on curves."

The fourth sign, "Watch Your Step," is used on all street cars and buses in El Paso. It is the same as that on Pullman cars and the effect has been to encourage passengers to think of safety in boarding the cars.

Four signs that promote safety in El Paso

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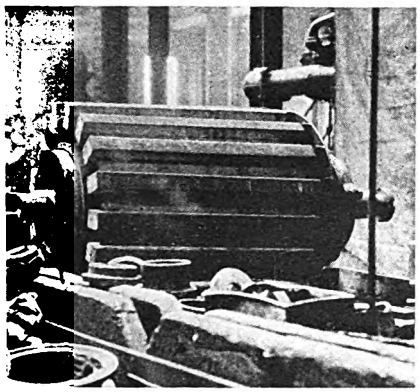
Maintenance Methods and Devices

Covering Protects Armatures

PROTECTION is afforded completed armatures in the shops of the London County Council Tramways, London, England, by encasing them in a covering of canvas and wooden strips. After an armature is wound, the connections to the commutator completed and the windings impregnated it is ready for the covering.

This covering is made of cleats of hard wood, attached at even distances on both sides of a strip of heavy can-



This cover of wood and canvas is snapped on each completed armature to prevent mechanical injury

vas. The thickness of the cleats is such that they make the outside diameter slightly larger than that of the blower at the pinion end of the armature. The length of the cleats is such that they project over the commutator. The covering is held in place by straps, so that the entire device somewhat resembles a shawl strap.

When the covering is placed on the armature it is an indication that the armature is completed. It remains on while the armature is in the shop and during its transportation to any car depot to which it may be sent.

Oiled Roadway as a Substitute for Paving

SATISFACTORY results have been obtained with oiled roadway between its tracks in several streets, instead of paving, according to the 1927 Coffin brief of the El Paso Electric Railway. Authority to use this substitute was requested originally of the authorities because of the high cost of paving, but the plan has also proved entirely satisfactory from a service standpoint.

The track area is filled up to the top of the rails with earth, to which crude oil is applied as a means of compacting the dirt and keeping down the dust. A little care is required to keep the space filled and smooth, and an application of oil has to be made twice a year, but when this is done the surface remains in good condition.

On certain streets where the natural soil did not take up the oil readily, the tracks were covered with a thin coating of fine crushed rock before the oil was applied. This was found to make an excellent surface.

The annual expense of maintaining and oiling these unpaved areas is less than 15 cents per foot of track.

Incidentally, the company is a large user of Tarvia K.P. for filling holes in paving and for replacing brick, wood blocks or asphalt which has to be removed when rail joints are repaired. The Tarvia is mixed cold with sand and small crushed stone in very much the same way as concrete is mixed by hand, the Tarvia taking the place of the cement. Once or twice a month a crew of four men can prepare enough of the mixture to keep them busy a week in making small paving repairs.

Tools Assist in Brush-holder Maintenance

By Jesse M. Zimmerman
Renewal Parts Engineer
Westinghouse Electric & Manufacturing Company

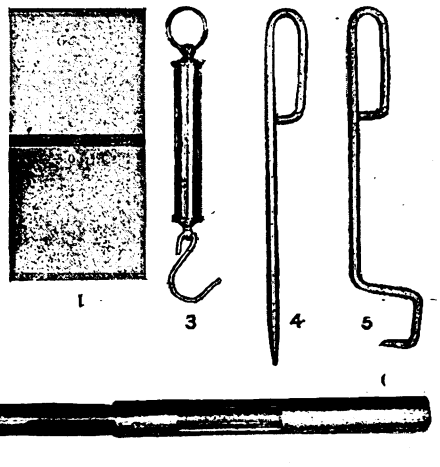
PROPER maintenance and inspection of brush-holders require a complete set of gages, scales and adjusting tools. Five tools desirable for the work are shown in the accompanying illustration.

1. The "Go" and "No-Go" gage is used to check the width of the carbon way. If the "Go" side of the gage enters the carbon way it is an indication that sufficient clearance will be insured when the carbon is placed in the box. If the "No-Go" side of the gage enters the carbon way it is an indication that the carbon way is too large, thereby permitting a loose brush fit. This tool is used by the manufacturer of the brush-holder, but the operator can make equally good use of it when he repairs the carbon ways of his brush-holders.

2. The spring scale shown has a fiber slide which is similar in dimensions to the carbon and takes the place of the carbon, thereby showing the true brush pressure exerted on the carbon during operation. This scale can be used only when the brush-holder is out of the motor.

3. The spring fish scale is very convenient for the car shop inspector, because it is small, easily handled inside of the motor and provides an accurate method of measuring the spring pressure.

4. Where the "twin washer" type of brush-holder mechanism is used a pointed tool is required to change the setting of the spring mechanism. The pointed end of the tool fits into any of the holes in the tension barrel, after which a pressure is exerted on the handle to relieve the tension on the



Desirable tools for proper maintenance of brush-holders

1. Go and No-Go gage for measuring size of carbon box.
2. Spring scale for measuring brush-spring pressure before brush-holder is installed.
3. Spring fish scale for measuring brush-spring pressure on inspection.
4. Tool for adjusting tension on "twin washer" type brush-holder mechanism.
5. Tool for adjusting pressure of ratchet type brush-holder mechanism.

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cotter pin so it can be removed. The tension barrel is then moved in the desired direction, after which the cotter pin is inserted in another hole.

5. The ratchet type of mechanism requires a different form of tool for making the adjustment. The point of this tool is engaged in the notch of the ratchet wheel, thus holding the wheel stationary while the dog on the contact member is moved to the desired notch.

Cars Scrubbed by Schedule in Fort Worth

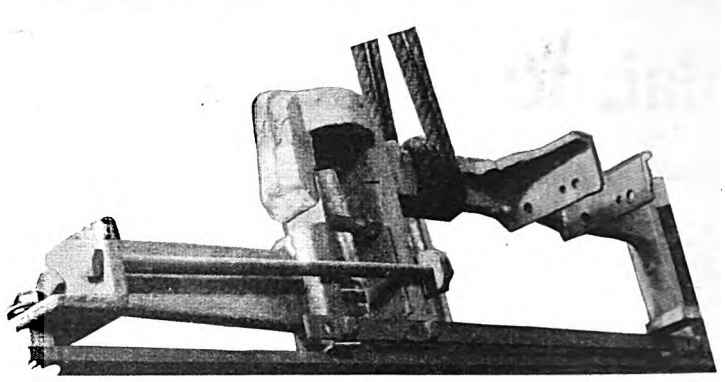
MORE attention to the appearance of both the interior and exterior of street cars is essential in its competitive campaign for passengers with the private automobile, the Northern Texas Traction Company, Fort Worth, Tex., believes. This means, besides fresh paint and varnish, more attention to car washing, especially as the repainting is done with lighter and brighter colors.

The new washing schedule, according to the company's 1927 Coffin Prize brief, calls for an inside scrubbing of the cars once every three months. This means that two cars have to be scrubbed every day. The work is done under the supervision of the paint foreman. The headlining, window posts, panels, seats and floors are scrubbed with soap and water. The car curtains and route signs are cleaned and the seats are rubbed with oil after the inside has had time for drying. The cars are then scrubbed carefully on the outside, touched up by the painter and left in the shop over night to dry thoroughly before going back into service.

Lining Up Broken Truck Sides for Welding

WELDING as an art has advanced to such a degree that a joint made in this manner is equal to or stronger than the original metal. However, if the welded parts are not in correct alignment the time and expense of the welding are wasted. This is particularly true of the welding of broken truck side pedestals. If these parts are not in alignment when reinstalled and are forced into their original positions undue strains are set up in the welded pieces. Misalignment or mechanical defects are created which may cause a failure of the weld or other mechanical ruptures.

This fact was appreciated by the mechanical department of the New York & Queens County Railway, New York City, in the Woodside shops and a simple but very effective method for assuring a correct alignment of the parts for the welding process has been developed.



Truck frame lined up for welding

A $\frac{3}{4}$x3-in. flat bar drilled for the correct end frame centers is bolted to the truck side end frame castings under the pedestals, so that correct alignment is assured when this is in place. A $\frac{1}{2}$x$1\frac{1}{2}$-in. bar drilled for the true centers of the pedestal tie bar bolts is bolted to the bottom of each pedestal. This places the outside surface of the pedestals in the proper alignment. A wedge placed between the end frame bar and the bottom of the broken pedestal is driven in until the proper distance from the spring casting to the bottom of the pedestal is obtained. This is set to a gage. An adjustable bolt placed on the face of the pedestal shoes permits the proper alignment to be obtained between the surface of the broken pieces and the paralleling of both sides of the pedestal. The two $\frac{7}{8}$-in. tie bolts inserted in the top of the end frame casting and through a plate on the back of the pedestal maintain the correct alignment and permit of the free movement without fear of changing the relationship of the various parts.

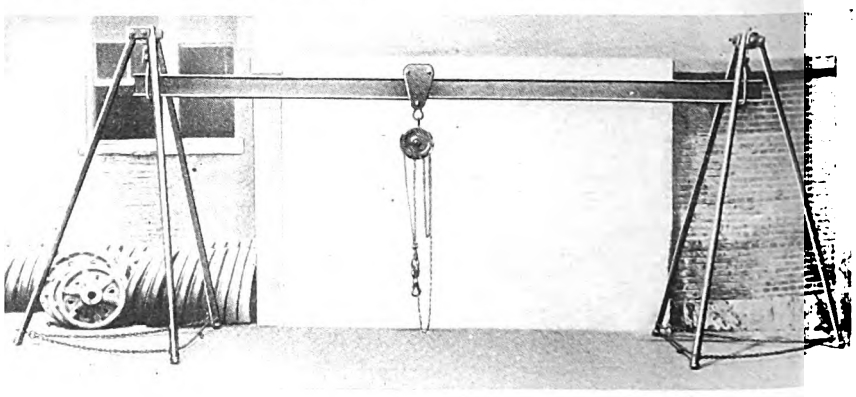
Since this method of aligning broken pedestals has been adopted no trouble has been experienced in reinstallation or welding failures.

Portable Crane Saves Labor and Speeds Work

HANDLING of rails and special work by the construction department of the electric railway system of the Arkansas Power & Light Company, Little Rock, Ark., has been made easier by a portable crane that was devised by the engineering department of the company. It was completed and installed in June of this year and has proved a great labor saver. Particulars are given in the Coffin brief for 1927 filed by the company.

The crane, which is shown in the accompanying illustration, is simple in construction and operation. It consists merely of two iron tripods, 8 ft. high; an 8-in. I-beam 20 ft. long and a chain block, carried by a trolley along the beam. A rail can be lifted from a pile on the ground and placed on the dolly by two men instead of the usual crew of ten or more. One of the effective features of the crane is the placing of the frogs and switches. With it the frogs can be set in the exact position that is required. In addition to the saving of time and labor, the portable crane has reduced accidents to workmen.

When the tripods of the crane are spaced 17 ft. between centers the beam is capable of holding 4,000 lb. The cost of the crane, including the chain block, was approximately $200.



Portable crane for saving labor and speeding work in use in Little Rock, Ark.

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New Equipment Available

Grinding Compound for Valves

FOR grinding and polishing valves to give a smooth finish on the seat, a new grinding compound marketed under the trade name of "Arico" is announced by the American Hammered Piston Ring Company, Baltimore, Md. After using the compound, the seat is cleaned easily with water or gasoline. "Arico" is a water mixed compound and is sold through jobbers in ¼-lb. and 1-lb. tins. It is also supplied in small utility tubes.

Small Reversing Switches

SMALL switches for miscellaneous application as across-the-line reversing switches for small motors are announced by the General Electric Company, Schenectady, N. Y. These switches, which are of three types, bear the designations CR 7009-F-1, F-2 and B-10.

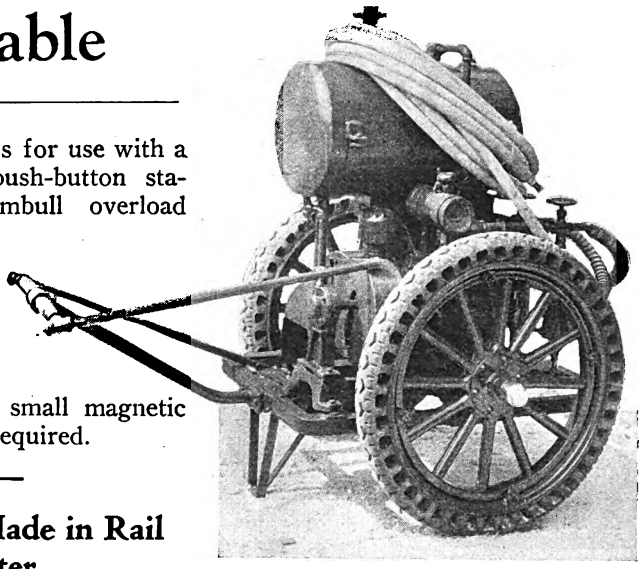
The CR-7009-F-1 and F-2 switches each consist of two 15-amp., double-pole contactors electrically and mechanically interlocked and inclosed in a drawn-shell inclosing case. They are for use with momentary-contact push-button stations. The F-1 form is without overload relays, while the F-2 form has Trumbull overload relays.

The CR-7009-B-10 switch consists of two three-pole, 25-amp. contactors mechanically and electrically interlocked. The switch is for use with a momentary-contact push-button station and has Trumbull overload relays.

All these switches are inclosed in a new type, drawn-shell inclosing case. They will find application wherever a small magnetic reversing switch is required.

Improvement Made in Rail Preheater

SEVERAL improvements in its rail preheater that add considerably to its efficiency and effectiveness are announced by the Metal & Thermit Corporation, New York, N. Y. The frame, which is cast in one piece, is of heavier material than was used formerly. Also, an oil reservoir is now provided which holds a sufficient quantity to keep the blower well supplied for a complete day's run. Another new feature is the introduction of a spiral spring to the hose connection that prevents the hose from kinking at the place of greatest wear. The new preheater retains all the desirable features of the old type, which include ball bearing motor, rubber tires, air strainer and compact design.

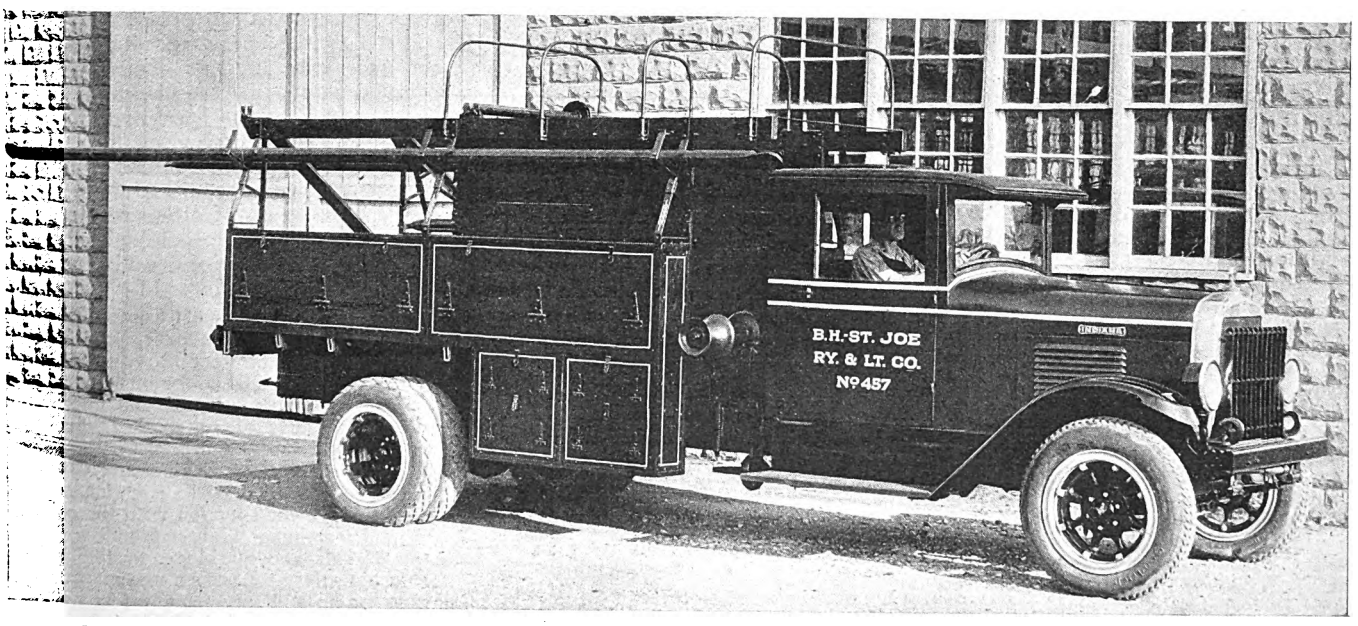


Improved type of rail preheater

Special Body for Line Maintenance

FOR quick repairs, line maintenance and pole setting, an advanced type of truck is announced by the Indiana Truck Corporation, Marion, Ind. The Model 115 includes a 2-ton chassis equipped with a special body and pole setter. The truck illustrated was furnished the Benton Harbor-St. Joe Railway & Light Company. It is provided with bows for a canopy or tarpaulin top and brackets on the side of the body for carrying the pole setter when dismantled. The body provides maximum tool and supply capacity with a minimum amount of space.

The pole setter is operated by a special winch mounted in front of the body and driven by a power take-off installed in the transmission.



Special body and pole setting equipment applied to 2-ton chassis for Benton Harbor-St. Joe Railway & Light Company

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American Association News

Accounting Questions and Answers

Replies to questions submitted to accountants' standard classification committee and to the bureau of accounts of Interstate Commerce Commission are published

IN THE report of the Cleveland convention, published in the issue of Oct. 8 of this JOURNAL, page 697, there was a reference to rulings on certain accounting questions made during the year by the bureau of accounts of the Interstate Commerce Commission, acting in conjunction with the committee on standard classification of accounts of the Accountants' Association. These questions and answers form a part of the annual report of the committee on standard classification and are given below in slightly abstracted form. They throw light on the proper method of classifying complicated electric railway charges.

Q. Road A, a steam road line, owns a bridge and uses the center, which is double tracked, for its own traffic exclusively. On one side of the double track is a roadway used for vehicular traffic, and on the other side is a single track, owned and maintained by Road A, leased to Road B, an electric line. It is used exclusively by the latter to operate an electric car service. Road A charges Road B a fixed sum for rental of the right-of-way of the track and also a bridge toll of 40 cents per car each way. How should these payments be charged?

A. The exclusive use of certain tracks on a jointly used bridge constitutes joint use within the meaning of the text of account 97, "Rent of Tracks and Facilities." The entire amount paid by Road B to Road A should be charged to Account 97.

Q. Our interurban cars are equipped with portable telephones so that passenger train crews can report to the train dispatcher any trouble which they notice when they do not happen to be near a station. Should the maintenance of these telephone sets be charged to Account 18, "Telephone and Telegraph Lines," or to Account 30, "Passenger and Combination Cars."

A. The first cost of the telephone sets should be charged to road and equipment account 518, "Telephone and Telegraph Lines," and the cost of maintenance to operating expense account 18, "Telephone and Telegraph Lines."

Q. To what account should be charged repairs to gasoline motor cars used by sectionmen, bridge gangs and linemen in getting over their territory. It is my belief that Account 9, "Miscellaneous Track and Roadway Expenses," should be charged with the expense of repairs to sectionmen's speeders; account 15 or 24, the expense of bridge and building gang speeders; and 17, 18 or such other accounts to the linemen's expenses.

A. The initial cost of gasoline motor cars for use by employees should be included in account 512, "Roadway Machinery and Tools." The cost of repairs to these cars should be included in accounts appropriate to their use. In this connection see case 51, "Accounting Bulletin 14." Cases 4 and 182 to which you refer are applicable only to gasoline motor cars used in revenue service.

Q. Suppose an existing road with a total investment in roadway and equipment of $500,000, whose property has recently been appraised at $900,000, was bought at a reorganization for $200,000, how should the property of the new company be set up on the books? Would it be proper to take the appraised sound values and scale them down on a per cent rate to all units? In the opinion of the committee, account 527, "Cost of Road Purchased," would apply in accordance with instructions contained on page 91, paragraph 3, "Basis of Charges," in the Classification of Accounts.

A. The opinion of the committee is correct. The actual money cost of the property should be reflected in account 401, "Road and Equipment."

Q. This company operates through a subway crossing under another railroad and frequently has to meet flood conditions at this point. Should the charge for labor be made to operating account 8 and for meals and material to operating account 9, or for both labor and material including meals to account 16, which appears to cover the drainage of undergrade crossings? We are also installing a new pump, pump house, and sump at this location. Should this cost be charged to capital account 615, and the labor and material for the pump house to account 524?

A. The cost of labor used in taking care of flood conditions at this point should be charged to account 8, "Track and Roadway Labor." The cost of material used and meals furnished to the laborers engaged on this work to account 9, "Miscellaneous Track and Roadway Expenses." The cost of installing the new pump, pump house and sump, should be charged to account 524, "Stations, Miscellaneous Buildings and Structures."

Association Posters and Booklets

RECAPITULATION of the posters and booklets issued by the advertising section of the American Electric Railway Association has just been made and forwarded to publicity men of railway and manufacturer members, giving the prices, which range from nothing to a few cents for each poster or booklet.

There is a complete series of safety posters. Six are on general subjects. Then there are six posters in the "Safe Highway" series and five in the "Aunty Jay Walker" series. The first set was made for the purpose of educating employees in safe ways and can be used with good effect about carhouses, employee rest rooms, etc.

A booklet, "Safe," by Managing Director Lucius S. Storrs, which has just been issued, tells how electric railways carry passengers with the smallest number of fatal accidents per passenger of any transportation system in the world.

Eleven posters and three booklets form a series of publicity material on traffic congestion. The booklets include "New York's Traffic Congestion Problem," by Gerhard M. Dahl; "The New York City Transportation Problem," by Lucius S. Storrs, and "The High Cost of Congested Streets," by C. O. Sherrill. The last, which is a practical discussion of the nation's traffic congestion, not only points out the different phases of the problem but suggests definite solutions of it.

There is a series of eight merchandising transportation posters. Two special one-sheet size posters made for use on the sides of freight cars, on stations, etc., advertise interurban freight service. There is also a Christmas poster.

Besides these series of posters and booklets, there are numerous booklets of general interest. These are principally reprints of addresses made before association meetings and general publicity matter on the association and the industry.

It is stated that because of the size and weight it is not possible to send out complete sets of samples, but that particular samples will be sent out to those interested on request to association headquarters.

Street Signal Study Indorsed

WORK of the American Engineering Council in the matter of street signs, signals and markings was indorsed by the executive committee of the American Electric Railway Association at the meeting held on Nov. 11. The A.E.C. has been requested to make a national survey of the situation with the objective of determining the best practice in regard to these matters. The text of the resolutions adopted, which were submitted by Thomas Fitzgerald, vice-president Pittsburgh Railways, follows:

Whereas, the National Conference on Street and Highway Safety, under the chairmanship of Secretary Hoover, brought out the necessity for uniformity in traffic signs, signals and markings, and improved protection by use of suitable car loading platforms and safety zones.

Whereas, American Engineering Council has been requested to make a national survey of the present situation with the objective of determining the best practices as to signs, signals and markings, loading platforms and safety zones, as a means of facilitating traffic and increasing safety on the streets of the cities of the United States.

Whereas, the work of the American

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Association of State Highway Officials in adopting standard signs, signals and markings, which standards are being installed on all federal aid roads, the necessity for developing standards for city streets is enhanced,

Whereas, studies have been and are being carried on in the principal cities of the United States approximating 140 in number, and a carefully selected committee has been appointed to represent all interests in this problem, including a representative of electric railways, and

Whereas, this committee needs the support of all parties interested in the problem because of its co-operation with other sub-committees of the National Conference on Street and Highway Safety, and

Whereas, it is proposed to develop a complete report on this subject and issue it for the use of all interested parties, therefore, be it

Resolved, That the American Electric Railway Association indorses this study and recommends that its constituent members help the work as they may deem fitting and proper.

More Association Committees Appointed

FURTHER announcements have been made by the association of committee appointments. Foremost among them is the American Association committee on publications, the personnel of which is now complete. In addition there are four Engineering Association special committees.

Announcement is also made that through error the name of W. R. Hulbert, New York, was included in the personnel of way and structures special committee No. 2. This should have been W. G. Hulbert, Easton, Pa., who has been a member of this committee for the past two years.

American Association

PUBLICATIONS

J. H. HANNA, president Capital Traction Company, Washington, D. C., chairman.
H. V. BOZELL, New York, N. Y., vice-chairman on *Aera.*
F. W. DOOLITTLE, New York, N. Y., vice-chairman on statistics.
J. L. ALEXANDER, Houston, Tex.
G. B. ANDERSON, Los Angeles, Cal.
T. W. CASEY, New York, N. Y.
CHARLES GORDON, New York, N. Y.
T. R. LANGAN, New York, N. Y.
H. H. NORRIS, Boston, Mass.
A. S. RICHEY, Worcester, Mass.
W. H. SAWYER, New York, N. Y.
R. S. TOMPKINS, Baltimore, Md.
E. P. WALLER, Schenectady, N. Y.

Engineering Association

POWER DIVISION—SPECIAL COMMITTEE No. 3—POWER CONTRACTS

M. W. COOKE, superintendent power and incline Pittsburgh Railways, Pittsburgh, Pa., chairman.
J. WALTER ALLEN, Boston, Mass.
R. W. BAILEY, Kansas City, Mo.
T. H. CLEGG, Philadelphia, Pa.
H. A. KIDDER, New York, N. Y.
R. H. RICE, Chicago, Ill.
R. L. WEBER, Boston, Mass.
G. F. MCCLELLAN, New York, N. Y.

POWER DIVISION—SPECIAL COMMITTEE No. 6—TROLLEY WIRE WEAR.

H. S. MURPHY, staff engineer Philadelphia Rapid Transit Company, Philadelphia, Pa., chairman.
J. WALTER ALLEN, Boston, Mass.
S. H. ANDERSON, Los Angeles, Cal.
W. H. BASSETT, Waterbury, Conn.
L. W. BIRCH, Mansfield, Ohio.
C. L. HANCOCK, New York, N. Y.
A. J. KLATTE, Chicago, Ill.
J. F. NEILD, Toronto, Ont., Canada.
JOHN ROSS, Pittsburgh, Pa.
ANGUS SCOTT, Cleveland, Ohio.
G. F. WENNAGEL, Baltimore, Md.

PURCHASES AND STORES DIVISION—SPECIAL COMMITTEE No. 4—PRICE RECORDS AND PRICING MATERIALS

A. A. ORDWAY, Boston Elevated Railway, Boston, Mass., chairman.
A. E. HATTON, Pittsburgh, Pa.
E. A. MURPHY, Indianapolis, Ind.
C. THORBURN, Los Angeles, Cal.

ROLLING STOCK DIVISION — SPECIAL COMMITTEE No. 5—ROLLER BEARINGS

W. C. BOLT, superintendent rolling stock and shops Eastern Massachusetts Street Railway, Chelsea, Mass., chairman.
H. A. ALLEN, New York, N. Y.
C. BETHEL, East Pittsburgh, Pa.
V. N. DELAMATER, Newark, N. J.
E. M. LUNDA, Grand Rapids, Mich.
K. W. MCPHERSON. Pittsburgh, Pa.
J. S. MCWHIRTER, New York, N. Y.
O. F. PACKER, Lawton, Mich.
W. C. SANDERS, Canton, Ohio.
G. L. SCHERMERHORN, Schenectady, N. Y.
W. C. WHEELER, Chicago, Ill.

WAY AND STRUCTURES DIVISION—SPECIAL COMMITTEE No. 5—WOOD PRESERVATION

C. A. SMITH, superintendent of roadway Georgia Power Company, Atlanta, Ga., chairman.
M. J. CURTIN, Charlestown, Mass.
T. H. DAVID, Indianapolis, Ind.
W. H. FULWEILER, Philadelphia, Pa.
C. F. GAILOR, New York, N. Y.
E. F. HARTMAN, Kenilworth, N. J.
L. P. SCANLAN, Newark, N. J.
F. H. SWAYZE, New York, N. Y.
A. P. WAY, Philadelphia, Pa.
R. H. WHITE, JR., Atlanta, Ga.

WAY AND STRUCTURES DIVISION — SPECIAL COMMITTEE No. 14—LIGHT SECTION RAIL

C. A. ALDEN, chief engineer frog and switch division Bethlehem Steel Company, Inc., Steelton, Pa., chairman.
B. R. BROWN, Dallas, Tex.
E. B. ENTWISLE, Johnstown, Pa.
H. M. FLANDERS, Springfield, Mass.
C. G. KEEN, New York, N. Y.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 28-30*—American Institute of Electrical Engineers, regional convention, Drake Hotel, Chicago, Ill.**

***Dec. 1-2*—Pennsylvania Street Railway Association, annual meeting, Scranton, Pa.**

***Dec. 2*—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York, N. Y.**

***Dec. 2*—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, New York, N. Y.**

***Dec. 7*—Power Transmission Association, annual meeting, Hotel Commodore, New York, N. Y.**

***Jan. 16-17*—Midwest Electric Railway Association, Hot Springs, Ark.**

***Jan. 18-19*—Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.**

National Relations and Depreciation

THE committee on national relations and the sub-committee on depreciation of the American Electric Railway Association met at Washington, D. C., on Nov. 8 under the chairmanship of J. H. Hanna, president Capital Traction Company of that city. The meeting was called for the purpose of discussing what action was to be taken by the American Electric Railway Association in connection with the hearings of the Interstate Commerce Commission relative to depreciation. The commission had set down the following day, Nov. 8, as that on which the steam railroad rehearing in Docket No. 15100, and the telephone rehearing in Docket No. 14700 should be begun, and also the hearing on Ex Parte 91, which concerns the new classification of accounts.

The chairman of the sub-committee on depreciation, Dr. Thomas Conway, Jr., outlined what his committee had done in the matter of collecting and tabulating material which would show the effect of the application to electric railways of an order similar to that contained in Docket No. 15100. He pointed out that a very critical situation existed for electric railways, due to the fact that any depreciation accounting system or system of accounts required by the Interstate Commerce Commission would probably be promptly adopted by the state commissions and thus made applicable to electric railways, whether or not they reported to the Interstate Commerce Commission.

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Judge Ralph R. Bradley of Chicago then read to the committee the statement which he proposed to make before the commission to the effect that the Electric Railway Association proposed to appear before the commission as a voluntary body, without prejudicing the right of any individual carriers to conduct their own case, but in order to demonstrate to the commission that the case of the electric railways is so entirely different from that of the steam railroads as to justify entirely different treatment. On that account he asked that the commission grant the opportunity for this industry to present its testimony at the conclusion of the hearings in Docket No. 15100 concerning steam roads, but *prior* to the promulgation of any order on the part of the commission in relation to steam roads.

The new system of accounting depreciation, if applied to electric carriers —and the commission has already issued one order calling upon our industry to show cause why Docket No. 15100 practically in its entirety should not be applied to electric railways— would make necessary an entirely new division of those accounts which contain depreciable items. It would obligate the carrier to determine as best it could the prospective service lives of the various items which constitute its property and to depreciate the said property on the basis of the service lives so determined. The commission's order calls for the application of depreciation accounts to almost all of the items of steam and electric railroads, including ties, rails, etc.

The commission recommends the group system as opposed to the unit system and also the straight-line method as opposed to the sinking-fund method.

Probably the part of the commission's order to which greatest exception can be and is taken is that to determine past accrued depreciation and to credit this to the depreciation reserve and concurrently charged to the asset side of the balance sheet. The effect of such an order would be to wipe out the surplus on a vast number of railroads and materially to disturb their credit. If the same provision were to be applied to the electric railways, it would without doubt injure their credit to such an extent as to render continuance of operations impossible.

The discussion in the committee revealed the fact that its various members are fully alive to the situation and are determined to make as vigorous a fight as possible in order that such system of accounting may not be imposed upon the industry.

The hearings are being watched in Washington at the present time by a member of the association staff, and it is hoped that ample notice will be given to the industry before it is called upon to give its testimony. The committee on national relations approved the report presented by Dr. Conway and authorized his committee to proceed to represent the association in any matters before the Interstate Commerce Commission.

News of Other Associations

New York City's Suburban Transit Problem*

Reservoirs in the outlying district fed by diverging transit lines and reached by north and south tubes in Manhattan would decentralize traffic and relieve the present congested condition

By Leverett S. Miller
President New York, Westchester & Boston Railway, New York, N. Y.

SOLVING the suburban transit problem of the metropolitan area of New York City is closely related to and dependent upon the solving of the urban transit problem within the city. It is my opinion that no adequate suburban plan can be developed efficiently, economically and conveniently to handle this metropolitan district traffic to and from the greater city of New York until the city has developed a plan, not by piecemeal but as a whole, for the handling of its own city traffic with which the suburban facilities may be co-ordinated.

Visualize the development of New York's great water supply and distribution system. As the city grew to the north, the main reservoirs of supply were moved beyond the density of population and the distribution to the consumer accomplished by aqueducts and systems of mains running north and south through Manhattan, the supply coming from watersheds to the north.

Here, to my mind, is a very good simile of an adequate and practical plan for suburban transit—the commuters being gathered through the outlying metropolitan district by a network of diverging transit lines, brought to distributing reservoirs located about the perimeter of Manhattan and then distributed through Manhattan by the various north and south transit lines of the city, built and to be built as a part of the city transit system.

Various plans have been proposed for the distribution of suburban traffic through Manhattan, the essential features of which have been the extension of the suburban carrier lines into and through Manhattan. It is my belief that these would only tend to centralize, rather than decentralize, the flow of traffic upon the streets. The claim that such an arrangement would lessen the inconvenience of transfer is exaggerated.

Would it not be more practicable to distribute the suburban travels through reservoirs, or terminals, at the extreme ends and possibly at the center side lines of Manhattan and thence through tubes extending east and west and lying below the main north and south rapid transit lines, built and to be built. This arrangement, with convenient transfer facilities, would permit the incoming suburban passenger to select a north or south rapid transit line which would take him nearest to his destination within the city. The system would also decentralize the traffic on the streets.

The changing of centers of business within the greater city of New York is also a factor to be considered in working out a plan for the distribution of suburban travel. The constant growth to the north and the shift of business centers east and west make questionable any plan of distribution in Manhattan through a single tube, or even through two tubes.

The problem of handling the suburban travel includes not only transporting the commuter from his home town to the city, but also from his home to the station where he boards the train. It is my thought that any adequate suburban transit plan should include a system of motor coach transportation in the home towns co-ordinating with the rail service, thereby furnishing a cheaper method of transportation between the home and the station than the privately operated car and lessening the congestion on the highway and in the parking spaces at the stations. By this means the development of property at right angles to the rail lines would become possible.

Abstract of a paper presented before the New York Section, American Institute of Electrical Engineers, Nov. 4, 1927.

Winter Meeting of New York Electric Railway Association

THE executive committee of the New York Electric Railway Association has selected Tuesday, Jan. 31, 1928, as the date of the winter meeting of that association. It will be held at the Hotel Commodore, New York City.

Met. Section Meets Dec. 2

FRIDAY evening, Dec. 2, 1927, the Metropolitan Section, A.E.R.A., will hold a joint meeting with the New York Section of the American Welding Society. After a Dutch treat dinner at Friedlander's Restaurant, International Night will be observed at the Engineering Societies Building. The feature of the evening will be lantern slides and movies of street railways in vacation lands. Rail joint welding will be discussed by F. B. Walker and E. M. T. Ryder, followed by a general discussion.

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News of the Industry

Five-Cent Rate Assailed

Rehearing on Oakland fare order to be held on Nov. 26. Company says order is confiscatory

ASSAILING the proposed 5-cent zone rate as confiscatory, the Key System Transit Company, Oakland, Cal., has appealed from the order reducing fares in the East Bay district and asked for a rehearing. The formal petition was filed on Nov. 19 with the California Railroad Commission. Officials of the company declare that if the rehearing is not granted they will appeal to the courts. In the petition the company declares that the 5-cent basic fare schedule will cause an annual operating deficit of not less than $693,531 and will force the company into receivership.

The commission is charged with negligence in failing to discover the transportation needs in the East Bay, in failing to discover the reproduction cost new less depreciation of the properties, in failing to find the fair value of the properties, in failing to find what would be a fair and reasonable return upon the properties, in failing to find the amount of net revenue needed to constitute a fair return and in failing to find the amount of additional net revenue which would be produced by the rates desired by the commission.

The petition cites the schedule of 1925 advancing traction line fares from 6 to 7 cents and ferry fares from 18 to 21 cents. This schedule, it is pointed out, was designed to increase the company's net operating income $846,000 yearly, but actually resulted in an increase of only $277,870. An increase in its net revenues of $1,000,000 yearly is needed to bring a fair return on the company's investment, the petition declares. The commission has agreed to hear the company's petition on Nov. 26 sitting *en banc*.

Preston Higgins, city attorney of Oakland, declares that Oakland will brook no delay in the case and that if the company is granted a rehearing the city will demand an extension of the 5-cent zone to include a portion of East Oakland. The Railroad Commission, in fixing the first zone, has discriminated against residents east of Lake Merritt, Mr. Higgins said.

Delay Likely in Considering New Toledo Grant

The election of William T. Jackson, former city service director and a strong advocate of city planning, as Mayor of Toledo without any political party backing him and no pre-election promises, appears to have changed the aspect of the franchise situation in that city.

Company officials who have been at work on an amended Milner ordinance to carry out the plans of the board of control and company officials agreed upon several months ago and who have completed a rough draft of the new ordinance question the advisability of bringing the measure before the public until the new law director has been named and the policy of the Mayor-elect determined.

The new Mayor is an independent who has inherited much of the old-time independent political strength in Toledo, but the City Council is strongly regular in political affiliation with practically the same character as has controlled in the last four years.

Both Mayor and Council would first have to agree on the terms of the ordinance before it could be brought before the people with any prospect that it would be approved. Many observers believe that almost any organized opposition to a new ordinance would mean its defeat. Under the circumstances it would appear that the entire matter may have to wait two months until the new administration takes office.

Union Agreement Discussed

Receivers of Des Moines City Railway have control over contracts. Nothing definite on one-man car issue. Service and rates to remain unchanged

SPECULATION as to the future of the two-man car agreement between the union and the Des Moines City Railway, Des Moines, Iowa, completely overshadowed all other phases of the receivership of the local railway during the week ended Nov. 19 when Federal District Judge Martin J. Wade issued a supplemental order apparently giving the receivers full power to terminate or suspend the contract.

The supplemental order followed the appointment of C. L. Herring and F. C. Chambers as receivers on Nov. 11. It authorizes them "to elect, to adopt or continue in force, or to refuse to adopt or continue in force any agreement, lease or other contract for operation which may be included in the property of which they are appointed receivers, whether made by the Des Moines City Railway or by any predecessor thereof."

The order goes on to say that "such election may be made from time to time and shall be made in writing, subscribed by said receivers and filed in the office of the clerk of the court subject to the approval of the court thereof, copy to be served upon the other party in interest, and no conduct or use of rights or payments made by said receivers, as rent, wages, or otherwise, or any other acts and omissions of said receivers . . . unaccompanied by the filing of such written instrument shall be deemed to conclude said receivers in respect to such election or be deemed to constitute an election to adopt or continue in force any such contract, lease or agreement."

The order is generally interpreted here as leaving the door wide open for the institution of one-man car service in Des Moines under the receivership. And although the court refuses to interpret his order and the receivers are noncommittal on the matter, they have assured the public that there is no present intention to curtail service, to increase fares or abolish the $1.25 weekly pass which allows unlimited riding for a seven-day period. It was pointed out that this leaves the one-man car as the only economy move left to the receivers of the railway, which had accumulated an operating deficit of $129,000 for the first nine months of 1927.

F. C. Chambers, president of the railway, who was put in full charge of all operations in connection with the property, with C. L. Herring, Des Moines business man, acting in an advisory capacity, estimates that one-man car operation would mean a saving of from $250,000 to $300,000 in trainmen's wages annually. Both figures are considered conservative, as the company pays slightly more than $700,000 yearly to motormen and conductors. However, the expense of extra trainmen for the loop district during the morning and evening rush hours is anticipated in both estimates.

The report of the court's supplemental order and its probable meaning brought forth a hot retort from J. Ben Wiley, secretary of the car men's union, who was instrumental in framing the twenty-five-year agreement which the Iowa Supreme Court has ruled binding upon the Des Moines City Railway until 1940. Mr. Wiley declared that in no city of the country had one-man cars resulted in a net lowering of fares which prevailed under two-man operation. He charged that the receivership was only a "camouflaged attempt" to get rid of the agreement and quoted the preamble of the agreement to establish that it was made between the union and the city railway and its "successors, heirs or assigns." Mr. Wiley served notice that the union will go to court to fight any attempt of a possible purchaser of the railway to evade the two-man car clause of the contract.

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Another Big Purchase Payment Ahead of Seattle

The Seattle Municipal Railway, Seattle, Wash., is again facing a financial crisis, for during the next few months sufficient money must be put aside from the revenues to meet another big payment due on the bonded debt on March 1. In consequence city officials plan to take immediate steps to make the most of a ruling by Judge Frank S. Dietrich of the United States District Court of Appeals, dismissing two suits involving the railway. These suits, one by the Puget Sound Power & Light Company and the other by John G. Von Herberg, both seeking to establish a priority lien on the department's revenues, have blocked negotiations and improvements.

The litigation has held up negotiations between Mayor Bertha K. Landes and the City Council, and A. W. Leonard, president of the power company, for an extension of time for the railway to pay on its railway purchase debt. Mayor Landes states that Mr. Leonard has signified his willingness to confer with members of the Council at any time. The latter body plans to renew its suggestion that the annual bond payment be cut from $880,000 to $500,000.

The City Council is also considering the plans for readvertising for bids for the building of 80 new cars for Seattle. A previous contract for building the cars was never signed because of a controversy over the matter of the priority of the obligations the city proposed the car builder should accept.

The Council also plans the passage of a $500,000 bond issue for construction of a railway trestle across the West Duwamish Waterway alongside the West Spokane Street traffic bridge. Construction of this trestle was contemplated in the $1,875,000 railway bond issue authorized for purchase of the cars and for minor track extensions. If a market is found for the bonds the trestle work will proceed at once and the cost of that construction and the new cars will be met by a single bond issue.

Get-Together Meetings in Philadelphia

Something entirely new in Philadelphia Rapid Transit Company activities took place on the night of Oct. 25 at the Luzerne auditorium, when the first get-together meeting was held. These meetings were begun with the idea of furnishing entertainment and enjoyment for the P.R.T. family. It was a rollicking party, topped off with snappy music and singing, and a short, well-pointed talk by President Senter. This speech of welcome was a typical genial Senter statement, in which he spoke of the P.R.T. co-operative spirit. He reminded the men of their pledge at the picnic meetings on the subject of wills, and urged them to take immediate care of this matter. The committeemen were also introduced by Mr. Nece at the conclusion of his talk.

This meeting was the first of a series planned to come at intervals of a week or ten days. The nights and locations will be changed each week, thus making it convenient for employees living in all parts of the city to attend at least one meeting near home. The program will follow the same lines as the one at Luzerne, with music, dancing and entertainment, but the entertainment features and speakers will vary.

Court Upholds Boston Transit Plan

In a 10,000-word opinion filed on Nov. 22 with the clerks of the State Senate and House, the full bench of the Supreme Judicial Court of Massachusetts clears the way for the enactment of a definite program by the Legislature of 1928. Answering 24 specific queries propounded by the House and eleven by the Senate, the Supreme Court makes these important findings:

That the Harriman bill of 1927, which contemplated the creation of a metropolitan transit system, with important rapid transit additions in and out of the city of Boston, is constitutional in almost every detail.

That the Commonwealth may lend its credit to this metropolitan transit system in order that improvements may be financed at about 4 per cent rather than at 6 per cent as under the existing public control.

That the Legislature has the right to liquidate the affairs of the elevated company to bring about the retirement of the 7 and 8 per cent preferred stock.

That the Legislature, in order that the cost of these improvements should not be borne entirely by the car rider, may assess betterments on the land area which will receive benefit and advantage beyond the general advantage to the community.

That new rapid-transit improvements, built with public money, may be leased to the operating company for a rental less than the sum necessary to meet interest and retirement charges and the deficit made up through betterments or the levying of taxation on communities benefited.

The ruling is regarded as opening the way to legislation to develop a metropolitan transit system in which the Boston Elevated Railway will participate.

Something New in Regulation

The application of the first four aerial transportation companies for State charters and for the right to operate airplanes in Pennsylvania were scheduled to be heard before the Public Service Commission on Nov. 3. The applications for incorporation were first filed with the State Department, which sent them to the commission for hearing before acting. The companies propose to carry not only passengers but freight, baggage and mail. The four applicant companies are the Gettysburg Flying Service, Gettysburg; the Pennsylvania Aerial Transportation and Express Company, Wilkes-Barre; the Reading Airways, Reading, and the Noble Aircraft Company, Pottsville.

Loss to Utilities Small from Washington Tornado

Washington utility companies, after an estimate of the damage done by the recent storm, found their losses were insignificant considering the velocity of the wind, which reached 125 miles an hour. Some 200 houses were destroyed or damaged and the Navy Yard and Naval Air Station, which were also in the path of the tornado, suffered slight injury. A few hundred feet of power lines were blown down, a number of conduits were flooded and several carhouses partially unroofed.

The street railway service suffered more by the accompanying rain than by the wind, due to the fact that the conduit system used in Washington becomes flooded when the sewers are overloaded and the immediate lines affected are thus put out of commission. Service on the lines of the Capital Traction Company was halted for only eleven minutes, due to flooded conduits, according to R. H. Dalgleish, chief engineer. This was practically the only damage suffered by the company except for the destruction of a large skylight at the Navy Yard carhouse. Mr. Dalgleish estimated the loss suffered by his company at $900.

The Washington Railway & Electric Company experienced most of its trouble as a result of tin roofs being blown on power lines, according to J. H. Stephens, superintendent of railways. There was a delay of 45 minutes on the Benning Road line due to this cause. A car was proceeding along this line as the storm struck, but possible injury to the passengers was prevented by the prompt action of the conductor in calling to them to lie down and pull their coats over them, thus preventing injury from flying glass as the windows were blown in. On the Anacostia line service was blocked by a large tree that had been blown across the tracks. The company also suffered several "water grounds" in its conduit sections and experienced trouble with the signals on its Rockville division, due to lightning interference. A portion of the roof of the East Capitol Street carhouse was torn off.

The Potomac Electric Power Company was fortunate in that the storm struck the section of the city where its lines are underground, according to R. B. Patterson, superintendent of distribution. Three overhead feeders were blown down and service lines to the wrecked houses were destroyed. The storm missed the Benning power house by a mile.

Fares Cut to Stimulate Riding

The Potomac Edison Company, operating local street car and bus lines at Cumberland, Md., has announced a reduction in fare from 7 to 6⅔ cents. The cut is to take effect at once. Thomas W. Peters, local manager of the company, said the reduction was made to stimulate riding.

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A Fool There Is

Providence people watch Mr. Autoist lose time, temper and trade, and then, lo, he reforms and rides the street car

"DRAW a picture and then he'll see it" has often clarified an abstruse problem. Of late, illustration of an argument has found its forte in the producing of a motion picture. A contention that it is more convenient, economical and in many instances time-saving to use the street car to and from business, compared with the automobile, has been explained in public speeches by the United Electric Railways, Providence, R. I., for several years. A decision was reached to prove the point by placing before the public a motion picture.

The picture, "East Side, West Side—All Around the Town," was made. All of the scenes are laid in Providence and all members of the cast are employees of the company. It depicts Messrs. Trolleyite and Autoist leaving their homes for their offices in the business center at 8:05 a.m. As a neighbor Mr. Autoist invites Mr. Trolleyite to ride with him, but the latter refuses, making it known that he prefers to use the trolley.

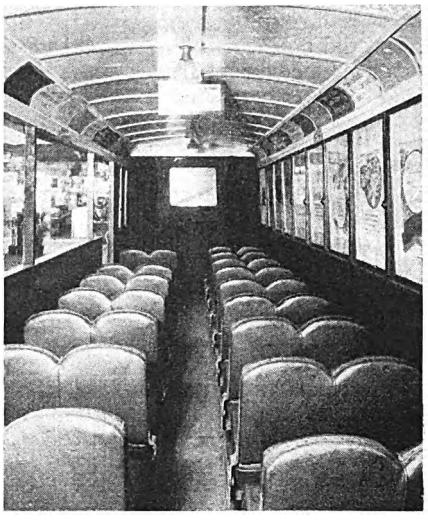
Mr. Trolleyite rides in comfort, reads his newspaper and reaches his office at 8:30 a.m.; 25 minutes is consumed for the journey. He is in a pleasant frame of mind, is courteous and polite to everybody and the day begins smoothly.

Mr. Autoist does not fare so well. He opens the garage door, gets into his automobile, backs it out, jumps out of the automobile, closes the garage door, re-enters the automobile and finally starts. Then troubles follow. A near collision with another automobile; waits at important cross streets for traffic to pass; impatient waits at busy corners in the business center; the vexing search for a parking space. Mr. Autoist finally breathes a sigh of relief when he stops at the curb to park, but becomes exasperated upon discovering a "No Parking" sign. He at last finds a parking space a considerable distance from his office location. He walks and arrives at his office at 8:50 a.m., twenty minutes later than Mr. Trolleyite, and both left their adjoining homes at the same time. He is cross and irritable. He discovers that he has lost a very important business deal that meant a good profit to him. He talks to his secretary about his late arrival, caused by traffic delays. His secretary advises him on the dependability of the trolleys in going to and from business. Mr. Autoist resolves to use the electric railway. The next morning he is seen boarding the trolley with Mr. Trolleyite and all is well.

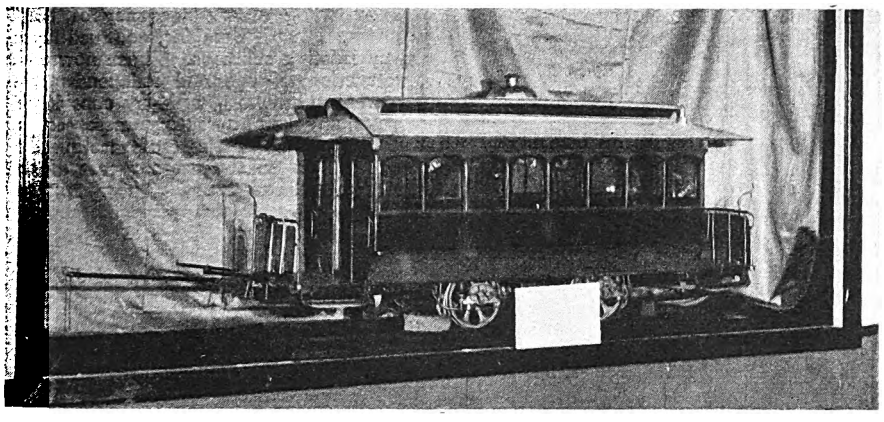
The picture consumes thirteen minutes in its presentation. It was first shown to the public at the Electrical Exposition held at the Rhode Island Auditorium in Providence, Oct. 8 to 15, inclusive. The exposition was attended by approximately 50,000 people and 12,982 persons saw the picture. The fact that more people did not see the picture was due to the fact that they could not get near it owing to the vast crowds that surrounded the booth in an endeavor to gain admittance. Only in the afternoons was freedom of passage to be found in the vicinity of the booth.

What proved to be a leading attraction was the exhibit of the United Electric Railways in the form of a street car 40 ft. long. Modern leather seats were installed with a capacity of 42 persons. One side of the car was closed in through the use of windows containing photostats illustrating twelve ways in which street car transportation benefits the community. The car model served as a motion picture booth. The model was made as realistic as was possible. Thirty cards with snappy, appropriate slogans pertaining to the railway business occupied the space devoted to car card advertising in a real street car. It was a fine opportunity to register some vital facts.

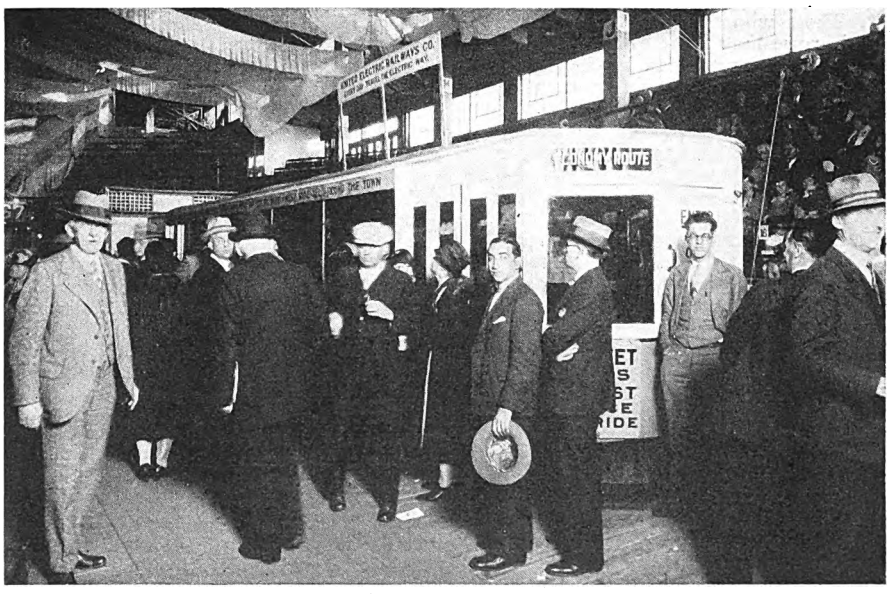
In the making of the picture and in the use of all publicity material in and outside of the car model the company took particular care to avoid making any ill references or casting any unsavory reflections on the industry's greatest competitor—the automobile. All efforts were devoted to merchandising the service and selling rides on the basis of economy and convenience of service and the time-saving under certain conditions.



The movie fan was made comfortable



A study in contrasts dating back to horse car days



Crashing the gate to see the Providence picture

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The attendant for the company, a neat-appearing, tactful starter in uniform, did not hear a single antagonistic or adverse comment from the thousands who viewed the picture. Many praiseworthy comments were heard, some of them being, "It is the truth," "Clever," "Very Good," "O.K." The exhibit was so well liked that strong and attractive inducements have been made to the company to install it at other expositions, exhibitions, shows and the like.

Nine-Cent Cash Fare in Rochester

An increase in cash fares from 8 to 9 cents on the Rochester lines of the New York State Railways, effective on Dec. 1, has been announced by City Railway Commissioner Charles R. Barnes. On the same day a new subway railroad, which is to be operated by the railway under the service-at-cost contract, will open. Commissioner Barnes said, however, that this event did not have any bearing on the fare increase. He attributed the fare advance to a burden of $631,383 from paving cost during the year. Fares in Rochester are based on a balancing fund which specifies that when there is a deficit of $100,000 the cash fare shall be raised 1 cent. On Oct. 1 the deficit was about $415,000 and approval of the State Public Service Commission is not necessary to increase fares in Rochester. Under the new schedule six tickets are to be sold for 50 cents with a 5-cent cash fare for children between ages of six and twelve.

Counsel Explains His Stand

Mr. Untermyer states the case for recapture and unification as he sees it. Favors city and property benefited standing construction costs

SAMUEL UNTERMYER, special counsel to the New York Transit Commission, addressed the Flatbush Taxpayers' and Civic Association on Nov. 21 on the present transit situation and his speech was an exposition of the case for the continuance of the present 5-cent subway fare and of his own plan for its continuance with equal justice to the car-rider, the city and the present transit companies. Among other things he said:

It is passing strange that although this is the most acute problem of the day for the city there is today less real understanding of the problem and more persistent, wide-spread misunderstanding than of any other question with which we had to deal.

Take, for instance, such questions as (1) the adequacy of the 5-cent fare, (2) of recapture and (3) of the effect of recapture on the public convenience, as dealt with both by its advocates and opponents. The advocates of a 5-cent fare may be divided into these three classes:

1. Those who favor it just because and only because they want to ride as cheaply as possible and regardless of the justice or economic soundness or consequences or the effect on the service of an inadequate fare and who know and care nothing more about it. It may be that they are in the majority, but I do not believe this to be true. The people are not quite so stupid as to believe that the cost of the service must not be paid somehow and somewhere.

2. There are those who, like myself, advocate and insist upon the adequacy of the 5-cent fare, so far as concerns the existing subways, who have become convinced from an intimate study of facts and figures, aided by experts, that if the city will take back its existing subway properties it can, by the expenditure of a moderate sum of money, furnish a vastly improved service and can, by the expenditure of less than one-fifth the cost of building new subways of the same capacity, increase the capacity of the present subways by at least 25 per cent and make plenty of money on the city's investment on a 5-cent fare—after paying the companies a substantial profit on the investments of the latter in the subways.

3. There is a considerable body of just, well-meaning and thoughtful people who favor an increased fare under the mistaken belief that an increased fare will in some mysterious, unexplained way improve the service. None of them has, however, shown how an increased fare will furnish an additional car or seat or otherwise improve the service.

When the city gets back these properties (properties in which it has invested $269,000,000, which with accumulated interest totals more than $330,000,000), a 5-cent fare will enable it not only to pay the interest and sinking funds on what the companies are entitled to get in return for their investment together with a bonus or profit to them of 15 per cent, but will also pay the interest and sinking fund on the city's present "frozen credits." It will be more than adequate for every purpose, including interest on the cost of improving the service on the existing subways. Detailed figures in support of these statements remain unchallenged.

This ceaseless repetition of a meaningless word has created an impression that there is something morally wrong or unjust about the exercise by the city of its right to terminate this lease on the terms prescribed by the lease. There never was a more wicked, willful falsehood—and all because of the use of the word "recapture" as a short and convenient term by which to define the contract right of the city to terminate the lease and take back its property on repaying the investment and a substantial profit for that right.

Although it would be to the manifest interest of the city and strictly within its legal and moral rights, it is not and never was intended that the city should recapture its recapturable subways and leave the balance of the rapid transit system—being the elevated roads—in the hands of the companies if the latter desired to, or were willing to sell the non-recapturable rapid transit properties on reasonable terms. The insidious attempts to create a contrary impression never had the slightest foundation or excuse. It is contradicted by every word and line of the report and recommendation of special counsel for the Transit Commission, by reference to which it will be found that the Interborough is offered $245,000,000 in city bonds, to include all its properties, subway and elevated, and that only in the event that it refused the offer, was "recapture" recommended.

No one has ever suggested that this was not a generous offer. If it is refused, what is there left for the city except to take back the properties to which it is entitled?

I do not think it will be betraying confidence to express the hope and belief that in the plan that will be put forth by the Transit Commission, a definite offer will be made to purchase the B.-M.T.'s elevated lines at a fair price, although for the year 1926 they did not earn within $812,000, and for the year 1927 not within $688,000 of their fixed charges.

If the B.-M.T. persists in its present attitude, what is there for the city to do, in order to unify its properties in connection with the subways now under construction, except to exercise its contract right to take back the B.-M.T. subway properties, all of which are city owned and all of which the city is entitled to recover?

The acquisition of the city-owned recapturable properties will give the car rider a longer haul than at present on the same lines for a 5-cent fare. In no event would he be inconvenienced or have to pay a double fare. It is about time to explode that bugaboo, which is causing so much unnecessary concern and creating so much false sentiment against the carrying out of the plans for unification.

In speaking of the adequacy of the 5-cent fare I have, thus far, confined myself to the existing subways. Those now under construction, if operated independently of the present subways, will pay considerably more than their operating expenses, but they will come far short of meeting their fixed charges on the present cost of construction and equipment. They can, however, in either of two ways, be made to pay on a 5-cent fare.

How to Get New Subways at 5 Cents

The first is by the Delaney plan, under which 62 per cent of the construction cost is added to the budget in yearly installments, so that only 38 per cent of the cost will be represented by city bonds, on which interest and sinking fund must be paid.

The other way, and what we are now undertaking to do, is to join and unify the new subways with the present subways, as purchased or recaptured by the city. The latter is now appropriating, paying and including in the annual budget $12,740,000 to meet the yearly fixed charges on the outstanding bonds that were issued for the construction of the present subways—from which the companies are corralling all the earnings to the total exclusion of the city.

Is it just that the car rider shall be burdened with the entire fixed charges on the construction cost of these subways into new territory, which cannot pay at the outset? Or is it fairer that the construction cost shall be paid in part by the property developed and in part by the city, which is also benefited in the way of increased assessment values? My idea is that the fare payable by the car rider should represent the entire cost of operation and one-half of the fixed charges on the cost of construction, and that the remaining one-half of the construction costs should be borne between the benefited property and the city.

Before closing, let me repeat the assurance that through unification you will have an improved and not impaired service. And let me warn you against standing in your own light by taking counsel of the fear that anything will be attempted that will dismember, cripple or impair the service. Do not permit yourselves to be misled. If we cannot do something largely constructive we do not deserve to succeed. The companies are playing for big stakes. One cannot blame them for fighting hard to hold on to your property, if they can. But so are you, for your stake in this great adventure is the ultimate welfare of your city.

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Dispatch Freight Service Termed Successful

After a month's operation the new dispatch freight service which was started Oct. 1 by electric railways in Ohio and Indiana has proved itself to be a successful addition to the companies' transportation activities, according to officials of the traffic department of the Union Traction Company. The service is offered by eighteen electric railways operating in the two states and extends to Columbus, Cincinnati, Dayton, Lima, Toledo and Springfield, O.; South Bend, Peru, Fort Wayne, Lafayette, Terre Haute, Richmond, Greensburg, and Connersville, Ind.; Louisville, Ky., and all intermediate points. The service is available over the following electric lines: The Chicago, South Bend & Northern Indiana Railway, Cincinnati, Hamilton & Dayton Railroad, Dayton & Troy Electric Railway, Dayton & Western Traction Company, Fort Wayne-Lima Railroad, Indiana, Columbus & Eastern Traction Company, Indiana Service Corporation, Indianapolis & Cincinnati Traction Company, Interstate Public Service Company, Lima-Toledo Railroad, Northern Indiana Power Company, Southern Michigan Railway, Southern Ohio Public Service Company, Terre Haute, Indianapolis & Eastern Traction Company, Toledo, Bowling Green & Southern Traction Company, Union Traction Company of Indiana, Western Ohio Railway and the Winona Railroad.

Fast transportation of merchandise affords the opportunity of buying on a smaller scale with a quicker turnover at greater profit, it is said.

Pleas and Pledges for Safety Sake

Nearly 200,000 persons have pledged themselves to use courtesy and caution on the highways during the coming year, the American Road Builders Association has announced in reporting the progress of its national highway safety campaign. The association is offering $1,000 in prizes for the best ideas that may be used in promoting safety on the streets and highways. It states that more than 22,000 persons have been killed on the streets and highways of the United States during the first ten months of 1927. Included among the objectives of the movement are the education of motorists and pedestrians in the ways of safety.

Minneapolis Suburb Seeks Fare Reduction

An interpretation of the Brooks-Coleman law vesting control of rate making in the Minnesota Railroad and Warehouse Commission has risen through application by Robbinsdale, a suburb of Minneapolis, for a reduction of the car fare from 11 cents. The suburb has voted against annexation by Minneapolis. The Attorney-General of the state has notified the village that the commission has no authority to adjust rates between contiguous municipalities. The line is part of the Minneapolis Street Railway. The rate in the city is 8 cents cash.

$2,000,000 Headquarters Opened in New Orleans

Invitations were sent out recently welcoming the public of New Orleans to the opening of the new $2,000,000 home of the New Orleans Public Service, Inc., on Nov. 7. It was proposed to have young ladies in the employ of the company present each guest with a pink carnation and serve each of them with a cup of real French-dripped coffee. Heretofore the headquarters of six or seven departments have been scattered in buildings removed from the main office, but from now on all departments will be housed in the new building, at Baronne and Union Streets. This structure represents the most modern development of office building construction. In planning it the convenience of customers has been considered as well as that of the workers. As a result the building is a model example in efficiency and comfort. Certainly it is one of the best equipped structures in the South devoted exclusively to housing a corporation.

The mechanical equipment of the building deserves special attention. The elevators are of the signal control type which is the latest development in elevator design and control; the telephone room has a complete automatic switchboard for the handling of calls in the building and calls coming into and going out from the building. In addition to this, there is a private inside telephone system connecting the executives with departments where quick and private communication is desirable. There are also telautograph and pneumatic tube systems.

The first floor is lighted entirely by indirect lighting reflectors concealed in plaster brackets attached to the columns. The upper floors are lighted entirely by indirect lighting fixtures suspended from the ceiling as it has been found after considerable experiment that the full indirect system of lighting gives the most satisfactory and comfortable light for office work.

Piedmont Hearing Set for Dec. 9

The Interstate Commerce Commission has assigned for oral argument on Dec. 9 the application of the Piedmont & Northern Railway in Finance Docket No. 6208 for a certificate authorizing the construction of two extensions of its electric line in North and South Carolina, which is being opposed by most of the steam railroads in the territory. The commission recently made public a proposed report by Examiner H. C. Davis recommending that the application be denied. The argument is to be heard by Division 4 of the commission, Commissioners Eastman, Meyer and Woodlock. The program of the Piedmont & Northern in this connection calls for the expenditure of more than $20,000,000.

Children Operate Houston Trolleys

To play "street car" will be a novel pastime for the children of Houston, Tex. Although the motormen will not be worried about safety and the conductors anxious about the exact fare, regular, full-grown trolleys with gongs, bell cords and all intact will operate in the playgrounds of the city. The Houston Electric Company is about to discard some old cars as new ones are placed in service and after talking to the director of the recreation bureau plans to present the old equipment to the city for children's playgrounds. Besides the fun to be had while playing "street car" the cars will also serve as sort of shelter houses for playgrounds that now have none.

New Orleans may well be proud of new home of its local utility

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Fare Readjustment Proposed in Galveston

Increased car fares and reduction in wholesale and retail power rates are proposed by the Galveston Electric Company to the City Commissioners. The reduction in power rates offered will amount to approximately 25 per cent and affect some 650 customers. The company does not contemplate further reductions in lighting rates at this time as reductions were made in the first part of 1927. According to the proposed street car rates regular patrons will pay 25 cents for a weekly ticket and 5 cents for each ride. Occasional riders will pay 30 cents for four tickets and the infrequent riders a 10-cent cash fare. The present fare is 6 cents.

Fare Hearing in St. Paul Deferred

Hearing of the application by the St. Paul City Railway for an increase in the rate of fare before the Minnesota Railroad and Warehouse Commission has been postponed until after Jan. 1. The first date set was Oct. 24 and the second on Nov. 1. The city desired more time from the third date set, Nov. 14. It is expected to be the contention of the company that the valuation of $16,503,557 set by the commission shows a return of only 4.64 per cent, instead of 7.5 per cent, the figure set by the commission.

Larger Welfare Plan in Virginia

A new benefit association has been formed covering the entire Virginia Electric & Power Company system and its affairs will be conducted as heretofore by a board of managers, the members of which are chosen by popular vote and hold office for a period of one year or until their successors are chosen. The old relief association formerly operated as two separate divisions for the Richmond and Petersburg and the Norfolk and Portsmouth districts of the company. The new association is a reorganization as of Sept. 1, 1927. It is conducted by and for employees to provide aid for members when incapacitated for work; to relieve distress and to promote fellowship and co-operation among members and their families. Sick and death benefits, hospital and medical attention and group insurance are provided in the larger welfare plan.

Knoxville Company Confident of Fair Treatment

Passage on first reading of an ordinance giving a franchise to the Knoxville Rapid Transit Company, Knoxville, Tenn., to operate buses on the streets of Knoxville, by the City Council, will make no changes in the plans of the Knoxville Power & Light Company to add twelve additional street cars to its service and readjust its rates for electric lights.

Announcement that the company would not cancel its order for twelve new cars given recently and would not withdraw its application for certain reductions in electric light rates pending before the State Public Utility Commission has been made by Col. C. H. Harvey, president, who is confident the Council would give fair consideration to the effect of transit competition.

Substitutions and Fare Increases Sought on Wisconsin Lines

The Marinette, Wis., Light & Traction Company, a subsidiary of H. M. Byllesby & Company, has petitioned the Wisconsin Railroad Commission for authority to curtail street car service in the city. If carried out the plan would include the abandonment of the interurban service to the city of Menominee, Mich., just across the river. Street car service between the two cities has been suspended all summer due to the fact that the two bridges across the Menominee River, which marks the Wisconsin-Michigan line, have been closed to travel and will need to be rebuilt. The matter of how much the railway company should contribute to the cost of rebuilding these bridges is pending before the commission. The company offered to substitute bus service in and between the two cities. This plan may be revived as a compromise.

The company has also asked for the right to increase fares on the proposed remaining lines in Marinette. This would mean a cash fare of 10 cents instead of the present 7-cent cash fare and three tokens for 25 cents instead of ten for 50 cents as at present. Instead of the present rule of fixing children's fares in accordance with their alleged ages, the company proposes to carry children under 40 in. in height free of charge if accompanied by a person paying fare. Children between 40 in. and 52 in. in height are to pay a 5-cent cash fare. Children over 52 in. in height are to pay the adult fare.

No-Parking Ban in Chicago Deferred Until Jan. 1

Postponement of a six weeks experiment of abolishing all parking in the downtown Loop district of Chicago during business hours of the day has been announced by Alderman Thomas Bowler, chairman of the City Council's committee on street traffic. The no-parking plan, which was adopted last month by the street traffic committee after lengthy consideration of the recommendations of Miller McClintock of Harvard University, was to have been put into effect on Nov. 15, but is now deferred for another six weeks or more by the decision of the committee. Fear that such drastic action might injure the business of downtown merchants during the holiday buying season is responsible for the committee's action.

Weekly Pass System in St. Petersburg May Be Extended

R. E. Ludwig, director of public utilities at St. Petersburg, Fla., is said to have indicated that if the sale of passes good for use on the St. Petersburg Municipal Railway is a success from the standpoints of increased patronage and satisfaction to the public, he would consider issuing a combination pass later that would be good for use on both railway lines and buses. The weekly passes are sold for $1. The proposed combination trolley-bus passes, if finally adopted, would be sold at slightly higher cost to counterbalance the difference in regular fares, which is 10 cents on the buses as against 7 cents on the electric cars.

Five-Cent Fare Cars Do Well in Seattle

The first day's receipts on the 5-cent fare line operated by the Seattle Municipal Railway, Seattle, Wash., in the downtown district were $57, the second day $74 and the third day $75. It is expected that revenues will increase with the Christmas shopping, and also will increase materially in rainy weather. The cost of operating these cars is very slight, as they are manned by trainmen running the trippers, who are guaranteed a minimum wage, but who do not put in enough time to earn this wage, and therefore are being paid for time which they are not working. Thus the time of the trainmen operating these cars costs the company nothing additional. These cars operate only from 9:30 in the morning until 4:30 in the afternoon.

The cars in use in the 5-cent service are painted a maroon and operate on First, Second and Third Avenues, from the railroad stations at the sound end of the business district to the northern end of the business district. Seattle's business district is pretty well spread out in a north and south direction, and it is thought that this 5-cent fare will pick up a number of riders who would walk rather than pay the regular 8⅓-cent fare. No transfers are issued on the 5-cent fare.

Kansas City Advertisement in Pamphlet Form

Samples of newspaper advertising used by the Kansas City Public Service Company, Kansas City, Mo., from June 1 to Oct. 1, 1927, have been put into booklet form. Herein is part of the regular advertising program of the company which appears regularly four times a week in the Kansas City *Star* and the Kansas City *Journal-Post*. The advertising campaign is being carried out with the idea of placing before the public, by a consistent and regular program, the mutuality of interest between the community and the transportation agency and to sell the idea of a greater use of the transportation facilities.

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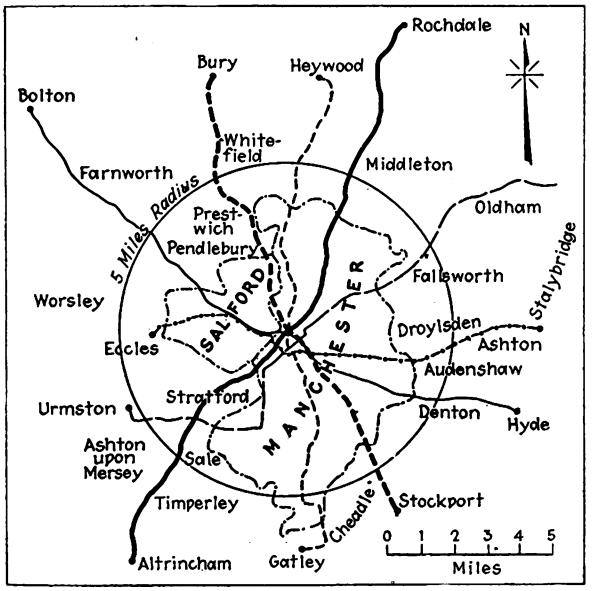
Foreign News

Big Express Motor-Bus Scheme at Manchester

Nine municipalities and two companies get together for first great co-ordination of tram and bus services in England

UNDER British law an English municipality ("corporation") cannot operate buses without special Parliamentary acts and, even then, restrictions will obtain as to the distances to which routes may extend beyond the city boundaries. On the other hand, it has proved extremely difficult to prevent private bus operators from entering the municipality and running such fares and services as they see fit. Usually some compromise is effected whereby the bus operator agrees to charge a higher fare along tramway routes to discourage local pick-ups, or else the tramways reduce their maximum (zone-rate) fares to a figure which buses cannot meet.



Six separate through routes at Manchester supplement trams and reach new areas

While fully determined to control all the public service transport within Manchester, the Manchester Watch Committee, through Henry Mattinson, general manager and chief engineer of the Manchester Corporation Tramways, has been working on a plan that would be fair to the city and to responsible outside communities and companies alike. This plan has now matured to the point where it is possible to announce the territory to be covered and the nature of the services. Regular express runs capable of indefinite extension will be made between Bolton and Hyde, Bury and Stockport, Heywood and Gatley, Rochdale and Altrincham, Oldham and Urmston and Stalybridge and Eccles. Each route will pass through some central part of Manchester and they will be interchangeable.

The purpose of these routes is twofold: One is to reach places beyond the tram terminals, the other is to give along the tram routes a specialized service for which the bus is better fitted than the rail-bound car under the road conditions obtaining. The nine municipalities of Manchester, Salford, Bury, Rochdale, Oldham, Ashton-under-Lyne, Heywood, Stockport and Bolton, as well as two private companies, the Stalybridge & Dukinfield Joint Board and the South Lancashire Tramways & Omnibus Company, have already come to an agreement for this joint undertaking.

Buses are to stop chiefly at the tramway fare stages, which are about ¾ mile apart. Several such services are already operated in Manchester, but Mr. Mattinson realized that their full possibilities depended upon the ability to continue as through routes into outlying territories. It should not be necessary for long-haul riders to have a change of buses en route.

The map shows that arrangements have been made for six separate through routes. While passing through Manchester, they avoid the exact center in order to by-pass the most congested district. Two special stops will be provided downtown, in addition to those at tram stages, so bus patrons may transfer from one route to another.

By the first week of November, 1927, through running rights had been obtained from all municipalities concerned except for the Statford stretch of the Rochdale-Altrincham route; but it was expected that this difficulty would soon be overcome. In several cases journeys now calling for a transfer and long waits for connections will be made without change. The initial fares will be approximately double the tramway rates in the Manchester district until experience suggests alterations.

Small British Tramway Suspends Service

In September the Redruth & Camborne Tramways, Redruth, England, ceased operation and buses are now the sole means of transportation. This tramway, which had been in operation for many years, was the only electric line in the county of Cornwall and was only 4 miles long. Abandonment was caused by bus competition. The track and rolling stock were offered as a gift to the Redruth Urban District Council, but the offer was declined. Tramway company officials expressed the belief that the time is past when the smaller tramways can be of material benefit to the public.

H. P. Stokes, the manager of the Plymouth Corporation Tramways, in commenting on this view pointed out that this was a short line in an unpopulous district and that it was a speculative venture that had never proved a success. In well-populated areas, he said, the tramcar remains the most economical vehicle for dealing with heavy traffic.

Service Increased for Theater Crowds

For the benefit of people going home from theaters, the London County Council has increased its tramcar services after 11 p.m. from five west-end terminals to provide seating accommodations for 31,500 passengers. Between 11 p.m. and midnight 255 cars, seating 18,600 passengers, leave these terminals. All-night service at longer intervals begins on the Council's tramway shortly before 1 a.m.

Co-ordinated Bus-Tram System in Glasgow

Purchase of 25 buses for the tramways department, Glasgow, Scotland, was authorized recently by the Glasgow Town Council. The new buses are to be used as auxiliaries to the tramways to extend municipal transportation services to new suburban districts. Tramway extensions to these suburbs is regarded as too costly. Previously the Glasgow Tramways has operated only a few experimental buses on a quiet route.

Improved Seats for London Street Cars

Orders for 355 upholstered spring seats for the upper decks of street cars have just been placed by the highways committee of the London County Council. It is expected that they will all be completed by next March. One car equipped with the new seats is to be put in operation on the London traction system in the near future.

Record Tramway Traffic in Liverpool

During a "civic week" held in Liverpool, England, the last of September, tramway traffic passed all previous records. The number of passengers carried was 5,600,000. The largest number ever previously reached in a week was 5,519,000 last July, when Liverpool was visited by royalty.

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Recent Bus Developments

"How, Where and Why" While En Route

An extensive and systematic drive is being made by the Illinois Traction System to popularize the McKinley Bridge at St. Louis for transcontinental and local tourists, urging the advantages of this gateway to the West and Southwest. Along the principal paved highways in Missouri and Illinois leading into St. Louis and within a radius of 60 miles of the metropolis of the Mississippi Valley are displayed well-painted highway signs directing attention to the McKinley Bridge.

A second edition of the booklet "Auto Trails Map of St. Louis" has also been issued this year, which tells in detail the saving in time and money made possible through the use of the McKinley Bridge. The tourist is also furnished a carefully prepared guide to St. Louis and auto trails map of the city and vicinity. At first this booklet was distributed through hotels, automobile clubs, direct mail and other miscellaneous sources, but more recently the railway has secured the cooperation of the principal gasoline-filling stations in St. Louis and the adjoining territory and the booklet is thus placed in the hands of the tourist while he is en route—the very best time to reach him. Each filling station is supplied with an attractive porcelain-finish sign reading: "Free map of St. Louis-McKinley Bridge Information."

Short Bus Extension in Minnesota

The Minneapolis Street Railway has been directed by the Minnesota Railroad and Warehouse Commission to run buses into Richfield, Minn., recently added to the city, covering about 1.1 miles. The new bus line will connect with the Bryant Avenue railway line.

Substitute Service in Mobile

Bus operation will be substituted by the Mobile Light & Railroad Company, Mobile, Ala., in the area served by the section of its Charleston-Beauregard line west of South Cedar Street, if an agreement reached by officials of the company and the city commission is approved by the Alabama Public Service Commission. It has been announced that the railway will proceed to withdraw its pending petition for abandonment of track and file a new petition asking for authority to abandon track on that division of the line and to establish a bus service as a substitute. Mayor Hartwell said the agreement provides for bus service to and from the Southern League field during the baseball season. Cash fares for the bus line will be 8 cents, the rate applying to the railway.

Inasmuch as the agreement to establish the bus line as a substitute service has only just been reached, the railway has not decided the number of buses to be operated or the schedule details. It was understood, however, that it will proceed at once to withdraw the present petition before the Public Service Commission and replace it with one providing for bus transportation.

Veteran Makes His Last Railway Run

John Noel, veteran trainman of the Wisconsin Public Service Corporation, ran the first car over the Duck Creek line when it was opened 25 years ago and he brought the last car in off of the line on Nov. 1, when buses replaced railway service on this 10-mile run. There were 1,400 riders on the line on the opening day 25 years ago and fewer than 300 on the closing day.

Operator of first and last runs on Duck Creek Line

Ordinance Restricting Miami Buses Reenacted

By more than four to one, citizens of Miami, Fla., voted against readmitting jitneys in competition with the railway. Not a single precinct in the city showed a majority in favor of the jitney. The present ordinance forbids the operation in the downtown section of Miami of buses that carry fewer than fifteen passengers.

The attorney for the jitney operators characterized the result of the election as a "temporary setback," saying he expected a Supreme Court decision in the next few weeks on the constitutionality of the anti-jitney law.

By Their Uniforms Ye Shall Know Them

All operators of buses of the New York State Railways, Syracuse lines, are clad in regulation uniforms of gray whipcord, with chauffeur's cap, black puttees, a khaki shirt and black four-in-hand tie. This snappy uniform, savoring of the military, will serve to distinguish the bus operators from railway motormen and conductors. Hitherto the bus and trolley men wore similar uniforms.

Shoppers Line in Minneapolis Proves Successful

The first year's operation of the Nicolet-Hennepin bus line from the heart of Minneapolis, Minn., to 36th Street by the Minneapolis Street Railway was a success. These vehicles used gas-electric motors of the no-gear shift type. In all, 1,173,571 passengers were carried from Oct. 14, 1926, to Oct. 31, 1927, returning at a 10-cent fare a gross of $117,357. This is a shoppers' line and does much intermediate haul business.

Two Fageol Twin Coaches have recently been installed on the 38th Street line, which operates at the street car rate with double transfer privilege. The type has six side seats, ten cross seats, all seating two passengers, and a rear seat for four. There are ten dome lights. Rear exit is pneumatically controlled.

Buses Patronized in Hillsboro

Three Graham Brothers buses have recently been put in service by the Illinois Power & Light Company at Hillsboro, Ill., taking the place of the recently retired street cars. Free transportation was offered the first day the buses went into service.

New Terminal in Camden Opened

The new bus terminal in Courthouse Square, Camden, N. J., was opened on Oct. 29. Its use permits South Jersey passengers to transfer to Public Service-P.R.T. buses for Philadelphia. Opening of the terminal was described as a move on the part of the Camden City Commissioners to relieve traffic conditions in South Jersey. On the day the terminal was opened the Public Service put two new buses in operation, one linking Burlington and Camden and the other running to Williamstown. Under the new transfer plan the passengers would be able to remain in Camden or to transfer to Penn-Jersey buses to Philadelphia.

NEW ROUTE APPROVED.—The Connecticut Company, New Haven, Conn., has been authorized by the Public Utilities Commission to operate a bus route in the eastern part of the city from the junction of Ferry and Lombard Streets.

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Financial *and* Corporate

Federal Court Is Asked to Retain Chicago Railways Receivers

A petition asking that Frederick H. Rawson, president of the Union Trust Company, and Henry A. Blair, president of the Chicago Surface Lines, be allowed to continue as receivers of the Chicago Railways without the appointment of a third receiver, to fill the place of the late John J. Mitchell, was taken under advisement on Nov. 11 by Federal Judge James H. Wilkerson on the motion of attorneys representing interests in the foreclosure proceedings. The motion asking for the continuance in office of the two other receivers was made on behalf of the receivers and was concurred in by attorneys for the bondholders' protective committee.

Increase in Brooklyn-Manhattan Net Income

An increase of $600,257 in the consolidated net income was realized by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for the fiscal year ended June 30, 1927. In the fourth annual report, just issued, it is stated that the gross income as shown was after providing for all maintenance charges, taxes and reserves for depreciation.

During the last two years the expenditures for maintenance of way and structure and of equipment, including reserves for depreciation, have totaled $22,429,270, which is 24.50 per cent of the total operating revenues of $91,551,560 for the two years.

On the outstanding preferred stock, four quarterly dividends were paid, aggregating $1,496,808, and on the outstanding common stock four quarterly dividends of $1 each were paid, aggregating $3,079,644.

The accompanying table showing passengers carried indicates that the increase in nine years in passengers on the rapid transit lines has been 148.03 per cent, and the increase on the system 78.2 per cent. It will also be noted that the surface lines carried nearly 270,000,000 passengers in 1927, which is about 50 per cent of the total surface traffic in Brooklyn.

On the subject of rapid transit the report states the city has now nearly completed the Fourteenth Street-Eastern line, the construction of shops and storage tracks near Coney Island and the lengthening of certain station platforms to accommodate eight-car trains. In anticipation of requirements for additional equipment the rapid transit operating subsidiary, New York Rapid Transit Corporation, purchased 213 cars, comprising 71 units of triplex articulated cars, which were equipped in the Coney Island shops and are now largely in use. The city has not yet started work on the construction of the Nassau-Broad line. This line, with the added facilities mentioned above, would materially increase the capacity and efficiency of the rapid transit lines under Contract No. 4.

The condensed comparative summary for the fiscal year ended June 30, 1927, and for the fourteen-year period from the commencement of operation under Contract No. 4, namely, Aug. 4, 1913, to June 30, 1927, shows the order in which such deductions are made from revenues and the application of revenues thereto, together with the cumulative deficiencies. It will be observed that the earnings for 1927 showed an excess over the year's deductions, applicable to the cumulative deficiency. The report states that with a continuation of favorable operating conditions and particularly with the additional facilities that the city is obligated to provide, it is hoped that the net revenue will continue to increase so that the cumulative deficiency of full deductions may be gradually made good.

COMPARATIVE INCOME STATEMENT OF THE BROOKLYN-MANHATTAN TRANSIT CORPORATION

	1927	1926
Total operating revenue	$46,710,592	$44,840,967
Total operating expenses, including depreciation	30,388,173	29,220,839
Net operating revenue	$16,322,418	$15,620,127
Taxes paid and accrued on operating properties, including contingent reserves for federal income taxes	3,250,896	3,260,384
Operating income	$13,071,522	$12,359,742
Net non-operating income	1,071,783	1,180,492
Gross income	$14,143,305	$13,540,235
Income deductions—Interest and rentals	7,789,025	7,777,877
Balance	$6,354,280	$5,762,358
Less—amount accruing to minority interests	5,834	14,171
Net income	$6,348,445	$5,748,187

PASSENGERS CARRIED

Fiscal Year	Surface	Rapid Transit	Totals
1918	255,569,584	265,400,020	520,969,604
1919	251,893,227	313,933,642	565,826,869
1920	278,832,742	380,190,890	659,023,632
1921	223,006,425	406,695,310	629,701,735
1922	250,412,364	446,384,508	696,796,872
1923	262,992,795	482,584,090	745,576,885
1924	266,421,409	539,069,076	805,490,485
1925	271,800,914	593,368,990	865,169,904
1926	269,233,866	623,099,695	892,333,561
1927	269,928,710	658,271,663	928,200,373

CONDENSED COMPARATIVE SUMMARY OF BROOKLYN-MANHATTAN TRANSIT CORPORATION OPERATION

	Year Ended June 30, 1927	Period Aug. 4, 1913, to June 30, 1927
Revenue	$34,155,938	$281,004,142
Operating deductions and corporation's first preferential	26,557,032	250,935,856
Balance available for return on new money invested under contract	7,598,906	30,068,286
Corporation's second preferential representing interest and sinking fund on corporation's contribution to construction and equipment under contract	5,470,623	45,585,174
Balance above corporation's second preferential	2,128,282	.....
Deficiency, representing amount by which revenue failed to equal interest and sinking fund on corporation's contribution to construction and equipment under contract	.....	*15,516,888

*Indicates decrease.

Change in Name at Wilmington

Stockholders of the Wilmington & Philadelphia Traction Company, Wilmington, Del., took action on Nov. 15 and changed the name of the company to the Delaware Electric Power Company. As the business is conducted largely in Delaware, with no operations in Philadelphia, and as the old name gives no indication of the company's large and growing electric light and power department, which serves approximately 70 per cent of the population of the state, it was deemed advisable to select a new name which would more clearly indicate the character and location of the company's combined business. Its general office, as heretofore, is located at 834 Market Street, Wilmington. T. W. Wilson is president of the company.

Delay Expected in Washington Merger Plan

Hearings on the District of Columbia traction merger plan will probably be delayed for several weeks. Harley P. Wilson, capitalist, who has been actively engaged working out a merger plan, informed a representative of the ELECTRIC RAILWAY JOURNAL, because he has decided on a series of conferences with himself and the presidents of the two companies in order to iron out some of the difficulties that have arisen. Meanwhile the firm of Charles Hansel, utility consulting specialists, is working out a plan for the consolidated operation of the street railway properties on behalf of the Federation of Citizens Associations. This latter plan, according to the statement of Col. Eugene Abadie of the firm, deals more with the technical phases of consolidated operation rather than with the financial side.

Another angle has been introduced by the proposal of William McKinley Clayton of the Federation of Citizens Associations to operate a "co-operative bus service," the necessary capital for which enterprise is to be raised by subscription among members of the various citizens' associations. Mr. Clayton believes that the street railway companies have no provision in their charters to allow their operation of buses and feels that this co-operative bus line would force the companies to effect a merger to the advantage of the citizens. Leon Arnold, who operates several bus lines between

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Washington and Virginian points and who was the former proprietor of the Washington Rapid Transit Company, is also in favor of this co-operative bus service proposal.

Mr. Wilson, in answer to a question as to what effect the merger would have on the purchase of new equipment, said his plan contemplated the properties as they were and what might be done with them afterward was a matter for the trustees to determine. He brought out that Washington's position as a reservation of the federal government caused some unusual problems in legislation affecting its utilities, and particularly in the matter of this merger an extra element was introduced because the necessary legislation had to be enacted by Congress. "No city has any business having competing transportation systems," Mr. Wilson said. "This merger business in Washington has been talked of for the last twenty years and now the time for accomplishment has come." However, he did not want to create the impression that he was seeking to force a merger.

John H. Hanna, president of the Capital Traction Company, stated that he had been for years in favor of some sort of service-at-cost plan.

ERNEST ISELIN A THIRD AVENUE DIRECTOR.—At the annual meeting of the stockholders of the Third Avenue Railway, New York, Ernest Iselin was elected a director, succeeding his father, Adrian Iselin, resigned. Other directors were re-elected.

Financial Readjustment in Helena

Utility properties in Montana city segregated under management of J. G. White & Company

AS OF Nov. 30 conversion rights will expire in connection with the financial readjustment of the utility properties at Helena, Mont. After the acquisition of the properties there by the two new corporations organized to hold them and the acquisition by J. G. White & Company, Inc., of the stock of the Helena Gas & Electric Company, J. G. White & Company, Inc., offered to depositors with the stockholders' committee of the old Helena Light & Railway Company the right to purchase from J. G. White & Company, Inc., each six shares of common stock deposited, at the same price per unit. It is this offer that expires on Nov. 30.

The properties formerly owned by the Helena Light & Railway Company were purchased at foreclosure sale by a representative of the bondholders' committee for and in behalf of that committee. Pursuant to a contract of purchase entered into between the bondholders' committee and J. G. White & Company, Inc., the electric and gas properties were segregated from the railway properties and the former properties were transferred to the Helena Gas & Electric Company, a new Delaware corporation, and the latter properties to the Helena Electric Railway, also a new Delaware corporation. Both of these companies are in operation.

First mortgage 6 per cent bonds due 1947, secured by mortgage to the Hanover National Bank, New York, trustee, dated as of Jan. 1, 1927, mortgaging the properties of the Helena Gas & Electric Company, including a pledge of all the outstanding stock of the Helena Electric Railway, consisting of 1,000 shares without nominal or par value	$750,000
$7 dividend cumulative preferred stock without par value, shares	2,805
Common stock without par value, shares	6,000

stock on the following basis: To depositors of preferred stock a unit consisting of one share of preferred stock and two shares of common stock of the Helena Gas & Electric Company for each two shares of preferred stock deposited, upon payment of $87.50 and accrued dividend for each unit. To depositors of common stock a unit consisting of one share of preferred stock and two shares of common stock of the Helena Gas & Electric Company for

All of the stock of the Helena Electric Railway is held by the Helena Gas & Electric Company and all of the outstanding stock of the Helena Gas & Electric Company was issued to J. G. White & Company, Inc. J. G. White & Company., Inc., paid the bondholders' committee for the properties by delivering new first mortgage 6 per cent bonds of the Helena Gas & Electric Company at par equal to 60 per cent of the principal amount of the old bonds held by the committee, and by paying cash equal in the aggregate to the remaining 40 per cent of the principal amount of the old bonds, plus accrued interest and a number of other charges and expenses. The outstanding capitalization of the Helena Gas & Electric Company is shown in the accompanying statement.

The final disposition of the Helena Electric Railway apparently remains in doubt. It is stated that the management may discontinue railway service in the near future and sell or liquidate the Helena Electric Railway.

Compiled for Publication in This Paper by

Conspectus of Indexes for November, 1927

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Nov. 1927 **7.56**	Oct. 1927 **7.54**	Nov. 1926 **7.42**	Nov. 1927 **7.56**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Nov. 1927 **141.8**	Oct. 1927 **142.1**	Nov. 1926 **156.6**	Sept. 1920 **247.5**	Sept. 1927 **141.6**
Electric Railway Wages* 1913 = 100	Nov. 1927 **228.3**	Oct. 1927 **228.2**	Nov. 1926 **226.3**	Sept. 1920 **232**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Nov. 1927 **198.9**	Oct. 1927 **199.2**	Nov. 1926 **203.7**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Nov. 1927 **202.0**	Oct. 1927 **204.4**	Nov. 1926 **210.8**	June 1920 **273.8**	March 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Oct. 1927 **146.5**	Sept. 1927 **145.7**	Oct. 1926 **149.7**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	Nov. 1 1927 **13.39**	Oct. 1 1927 **13.26**	Nov. 1 1926 **12.74**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Oct. 1927 **156.1**	Sept. 1927 **154.0**	Oct. 1926 **160.0**	July 1920 **219.2**	March 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Oct. 1927 **163.7**	Sept. 1927 **162.8**	Oct. 1926 **167.2**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Oct. 31 1927 **3.341**	Sept. 30 1927 **3.148**	Oct. 31 1926 **3.684**	July 31 1920 **11.118**	May 31 1927 **3.051**
Bank Clearings Outside N. Y. City (Billions)	Oct. 1927 **19.97**	Sept. 1927 **18.62**	Oct. 1926 **19.83**	Oct. 1925 **20.47**	Feb. 1921 **10.43**
Business Failures Number	Oct. 1927 1474	Sept. 1927 1417	Oct. 1926 1420	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**33.67**	**52.65**	**39.82**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Short Abandonments in New York Sought

The Empire State Railroad Corporation petitioned the Public Service Commission recently for approval of a declaration of abandonment of sections of the Clark Street line in the city of Auburn, N. Y. It also sought a declaration of abandonment of a part of the line in Fulton, Oswego County, for a distance of 0.55 mile. These lines, the company alleged, were no longer necessary for the convenience of the public.

Discontinuance in Walnut Ridge

The Walnut Ridge, Ark., City Council has adopted a resolution permitting the Arkansas-Missouri Power Company

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to discontinue operations of the electric railway in Walnut Ridge.

The railway has been operating only in Walnut Ridge since the municipal authorities of Hoxie served notice on the company in August, ordering it to discontinue operations in Hoxie. After six weeks the company took up the tracks in Hoxie. The controversy between Hoxie and the company came up over the extension of the tracks in that city and summary action was taken when the Hoxie authorities barricaded the tracks on the expiration of time given the company to extend the tracks and service.

Data on Stock and Borrowed Money in California

For the year ended June 30, 1927, the California Railroad Commission authorized $1,500,000 in electric railway issues. This compares with $4,362,461 in 1926 and $3,515,496 for the year ended June 30, 1925.

In commenting on this the commission stated that in the last three years there appeared to be a tendency among the utilities to finance their construction to a greater extent through stock issues. This seemed to be caused, in the early part of the period, by the inability of some companies to have bonds certified, due to decreased earnings resulting from water shortage, and in the latter part by the policy, on the part of some, to even the ratio between the outstanding stock and bonds.

Since the effective date of the public utilities act on March 23, 1912, up to June 30, 1927, the commission has authorized the issue, for additions to and betterments of properties, of securities in the total amount of $1,380,923,997, of which $596,563,245, or about 43 per cent, has been represented by stock and $683,360,752, or about 57 per cent, by borrowed money.

Insulls After Western United

A controlling interest in the Western United Gas & Electric Corporation, which operates electric, gas and local and interurban transportation services in suburban territory adjacent to Chicago, is reported to have been acquired on Nov. 19 by Samuel Insull and associates of Chicago. The Western United properties, representing an investment of approximately $32,000,000 in utility services in about 70 communities, were controlled by Col. Ira J. Copley, who has resigned as president.

About two years ago a large share of the stock passed into the hands of A. E. Fitkin & Company, but was recently disposed of to E. H. Rollins & Sons Company, Chicago investment bankers, from whom the Insull interests are said to have just purchased control. The Western United Corporation operates the local railway lines in the cities of Aurora and Elgin, Ill., and through the Aurora, Elgin & Fox River Electric Company the interurban lines connecting these two points.

Personal Items

Omaha Awaits J. N. Shannahan

Public utility operator and former A.E.R.A. president becomes president of the Omaha & Council Bluffs Street Railway

THERE are always rejoicings in his arrivals and regrets in his departures—the former induced by the story of his accomplishments and conduct and the latter because acquaintance with his character satisfies a physical and mental need. While Newport News and its environs bemoan the fact that John N. Shannahan will no longer be counted among their citizens, Omaha avidly awaits his coming on Dec. 1, for upon his shoulders will fall a large part of the responsibility for lifting up a company weighed down with financial burdens and franchise difficulties. Similar difficulties have been surmounted by him in the past, notably at Newport News, where he was president and principal owner of the Newport News & Hampton Railway, Gas & Electric Company until early in 1926, when the former president of the American Electric Railway Association concluded a deal in which control of that property passed to the Fitkin interests. Since then Newport News has been watching Mr. Shannahan's efforts in the development of large real estate holdings of the Old Dominion Land Company. It was generally felt, however, that the 55-year-old executive was endowed with too much vitality and genius to divorce himself from some public service enterprise. His recent election as president and general executive of the Omaha & Council Bluffs Street Railway substantiates this view.

J. N. Shannahan

The details of Mr. Shannahan's steam railroad experiences, electric railway accomplishments and American Electric Railway Association activities are familiar to readers of the ELECTRIC RAILWAY JOURNAL and to the utility field in general. Let it suffice to say that his first knowledge of railroading was gained during his summer student vacations by working as a locomotive fireman on the Delaware & Hudson Railroad. After he was graduated he served in various capacities with the New York Central & Hudson River Railroad. It was in this territory, namely, Troy, N. Y., that Mr. Shannahan, born in August, 1872, received his preparatory education at the Troy Academy, a degree of civil engineering from the Rensselaer Polytechnic Institute in April, 1894, and laid the foundation for a public utility career which was no more conspicuous for its attainments in community progress than for the influence it wielded as the moving spirit of fairness and generosity, integrity and loyalty.

His services in the operating department of J. G. White & Company, as vice-president and general manager of the Washington, Baltimore & Annapolis Electric Railway and with the Fonda, Johnstown & Gloversville Railroad all helped to increase his fund of knowledge, to develop his powers of observation and judgment and to whet his appetite for the tastes of the men with whom he came in contact, whether they were responsible to him or he to them.

The real market for his talents opened up in 1912, when he took over the management of the Newport News & Hampton Railway, Gas & Electric Company and successfully conquered certain endemic hazards.

When the sale of the Hampton property was announced early in 1926 it was said that Mr. Shannahan would continue to remain head of Shannahan-Cherry, Inc., public utility operators. Somehow the disappointment over the transfer of this property felt by local communities was mitigated by the fact that Mr. Shannahan was still to stay in the railway industry. The commendatory comments of the press at that time gave evidence of his success as a public relations man, and in unmistakable terms indicated how deeply he had intrenched himself in the affections of the Virginians.

Fred Hamilton, Omaha banker, has retired as president of the Omaha company, but will remain chairman of the board, while R. A. Leussler continues as vice-president and general manager under the new president.

Commissioner Hall to Withdraw from I. C. C.

Commissioners Meyer and Hall of the Interstate Commerce Commission conferred separately with President Coolidge at the White House on Nov. 10 at the request of the President. Commis-

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sioner Hall said afterward that he had advised the President some time ago of his desire to retire from the commission but that he did not expect to leave until his own docket was cleaned up because the commission is burdened with an unusually large amount of work, and that the date had not been determined.

JOHN A. MATTHEWS, assistant in the engineering department of the Altoona & Logan Valley Electric Railway, Altoona, Pa., was recently named engineer in charge of maintenance and construction. Mr. Matthews, a graduate of Penn State, entered the engineering department of the Altoona & Logan Valley Electric Railway in 1919, being assistant to former Engineer Frank D. Hain and to Engineer Brubaker. The new incumbent of this post succeeds G. S. W. Brubaker, who went to Altoona in 1926 to take charge of rebuilding operations under direction of the General Engineering & Management Corporation, New York, operator of the line. The company expended a total of $533,435 in new track construction, rebuilding several lines and sections of other lines. He resigned to enter a business partnership.

DILLARD W. LAYNE has become general agent of the Pacific Electric Railway with office at Long Beach, Cal. Mr. Layne has been with the railway since 1899. For the past six years he has been traveling freight agent for the Pacific Electric Railway, but most of his time with the company has been spent in the northern division. In his new position he will have entire charge of the traffic end of the business. Mr. Layne succeeds Willis R. Osborn, who did that work for the past seven years. He goes to Huntington Beach as agent.

WILLIAM STOKES has replaced John C. Mellett as head of the Indiana Public Utility Association and the Indiana Committee on Public Utility Information. The office of these bodies is located at 1547 Consolidated Building, Indianapolis, Ind.

IRA H. ROWELL, a resident of Berkeley, has been appointed an examiner of the California Railroad Commission to succeed Reginald L. Vaughan, who has been appointed assistant attorney of the commission. Mr. Rowell has been practicing law in San Francisco since 1923, when he was given the degree of doctor of laws by the University of California. He was formerly a resident of Fresno, and for ten years was associated with the Fresno *Republican*.

GEORGE H. CONKLIN, director of public relations of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., was elected secretary and treasurer of the North and South Carolina Utilities Information Committee at the recent annual meeting of that organization held in Charlotte, N. C. In this capacity he succeeds Raymond Hunt, vice-president of the Tidewater Light & Power Company, Wilmington.

R. F. Carbutt Honored

Doherty operating executive elected to head Metropolitan Section of the A.E.R.A.

ROBERT FOSTER CARBUTT, on the operating staff of the public utility division of Henry L. Doherty & Company, New York, since 1909, has been elected president of the Metropolitan Section of the American Electric Railway Association. Mr. Carbutt's range of activities with the Doherty organization is very wide since he is in charge of the supervision of electric railway and bus operation of subsidiary properties controlled by that company and acts as examining engineer on new projects and in an advisory capacity in the administration of the personnel of the subsidiary utility properties.

Mr. Carbutt was born in Philadelphia on Oct. 12, 1878. He was graduated with the degree of B. S. in electrical engineering from the University of Pennsylvania in 1901. From 1901 to 1903 he was engineer of the Keystone

R. F. Carbutt

Company, Philadelphia. In 1903 and 1904 he was manager of the St. Petersburg Railway & Electric Company, St. Petersburg, Fla. In 1904 and 1905 he was engineer on construction work on the Rochester, Syracuse & Eastern Railroad for J. B. White & Company. For the same company he served on the operating force of the Eastern Pennsylvania Railway at Tamaqua, Pa. This was during 1905 and 1906. From 1907 to 1909 Mr. Carbutt was manager and chief engineer of the Southern Public Service Company, Washington, D. C. Since then, as previously noted, he has been connected with Henry L. Doherty & Company.

In the past few years, particularly since 1924, Mr. Carbutt has been active in affairs of the American Electric Railway Association. In 1924 he was regional vice-chairman of the committees on city operation, company and associate membership. In 1925 he was vice-chairman of the committee on management and operation, and an alternate of the American committee on inductive co-ordination. In 1926 he was chairman of the committee on management and operation and in 1927 was vice-chairman of the committee on co-operation with state and sectional associations.

OBITUARY

Charles S. Mellen

Charles S. Mellen, formerly president of the New York, New Haven & Hartford Railroad and the Boston & Maine Railroad, died at Concord, N. H., on Nov. 17. Mr. Mellen had been retired from active railroad work for a number of years.

With the Morgan power behind him, Mr. Mellen launched sweeping plans for the New Haven, asserting that monopoly was best for New England transportation. So vigorously did he carry on that he won for himself the appellation "Shirtsleeves" Mellen. In the next ten years the New Haven absorbed electric railways in both Connecticut and Massachusetts and outside land and water competition to the extent of more than $200,000,000. The program of the management provoked a public storm. Courts, legislators and the Interstate Commerce Commission arose to challenge Mr. Mellen and his associates in their course. Mr. Morgan died at this critical time and Mr. Mellen passed into retirement in 1913.

In the program of expansion upon which the New Haven Railroad entered under Mr. Mellen that company did only what other similar carriers had done or were doing, but public disapprobation seemed to center about him. It would appear that the more mature judgment of E. J. Pearson, now president of the New Haven, is much more nearly correct than was the hasty judgment passed upon his acts during the turmoil that attended the investigation of the New Haven under Mr. Mellen. This does not mean that there was not room for honest differences of opinion over the appraisal of his acts, but the judgment passed by Mr. Pearson seems to be fair that as "the circle of time passes, the excellence of Mr. Mellen's work on and plans for not only the New Haven Railroad but New England are understood more clearly and better appreciated. His foresight was in the right direction." Although he did not always get credit for having it, Mr. Mellen was endowed with a keen appreciation of the ridiculous, and those who knew him well realized that during the period of his retirement he was able to look back over the events of the past with a charitable eye.

Born at Lowell, Mass., Aug. 16, 1851, Mr. Mellen at eighteen chose a $25 a month clerkship with the Northern New Hampshire Railroad, in preference to college.

JOSEPH R. ROACH, assistant interurban superintendent of the Portland Electric Power Company, Portland, Ore., died recently. He had been with the company for 26 years.

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Manufactures and the Markets

Minneapolis' 25 New Units to Go Into Service Dec. 1

Twenty-five new street cars of the most modern type in street railway equipment it is reported will be put in service in Minneapolis and St. Paul, Minn., Dec. 1 by the Twin City Rapid Transit Company. Mention of these cars was made in the JOURNAL March 12 and Sept. 24.

The cars, which are now under construction at the company's plant at University and Snelling Avenues, will cost $300,000. They will be the first of a number which, it is understood, will be used to replace the present cars and each of them will seat 50 persons, 28 of them on cross-wise seats and the balance on the side seats. The cars will be light in weight and attention has been given to reduction of noise. They can be operated either as one-man or two-man type cars. The bodies are lower than the cars now in use; they have a long, rakish appearance, due to the rounding of both the front and rear ends, and have stream lines. The frames are constructed of steel and duraluminum and the sides of wood. The reason wood instead of steel was employed, according to W. J. Smith, master mechanic of the street railway company, is because of its lighter weight, minimum of vibration and insulation qualities for keeping out both heat and cold. The seats are built on more of a slant than those now commonly in use and it is claimed are more comfortable and provide greater legroom for the passengers. The rear of the seat is protected by an aluminum piece to prevent soiling of the passengers' clothing by the feet of those seated in the back. The cars are heated by electric heaters and are so designed as to provide increased light for reading and reduce the glare and shadow to a minimum.

"The company has not yet determined just what lines the cars will be operated over, but it is quite certain that they will be divided between Minneapolis and St. Paul," Mr. Smith said. "In designing these cars we have striven to make a practical, safe car which would include beauty of design and such refinements as would attract passengers and make them feel just as much at home in our cars as they would in their own automobiles."

200 Perey Turnstiles Ordered for B.-M. T.

An order for 200 Coinpassors, non-electrical, coin-controlled turnstiles, has been placed with the Perey Manufacturing Company, New York, N. Y., by the Brooklyn-Manhattan Transit Corporation. The machines were described on page 831 of the Oct. 29 issue of the JOURNAL. They are also being used by the Philadelphia Rapid Transit Company, Public Service Railway of New Jersey, the city of New York at its ferry terminals and in the Grand Central Terminal, New York City, and the South Station, Boston.

Big 1928 Improvement Program for Railway Agreed On

An improvement program for 1928 involving the relaying of 142,000 lineal feet of railway track at a cost aggregating $1,300,000 has been agreed upon by the Cincinnati Street Railway, Cincinnati, Ohio, and the City Council committee on highways. The tracks will be rebuilt in conjunction with the improvement of 29 streets by the city. Walter A. Draper, president of the railway, said that the sum involved represents three times as much reconstruction work within a year as the company is compelled to do under the provisions of its new franchise. In order to carry out the program it is understood the Council will have to pass an ordinance now pending before it to permit the street railway company to borrow the money necessary to pay for the improvements. The amount would be repaid from the company's revenue.

V. E. & P. Double Tracking Bay Shore Line

The first actual construction work that is to play a part in the Ocean View, Va., development, destined to cost $2,000,000, is under way with forces of the Virginia Electric & Power Company engaged in double-tracking the Bay Shore line of the Norfolk division, with a view to a complete rearrangement of its Ocean View service, it is reported, as the basis for that resort's development. Mention of the project and the appropriation was made in the JOURNAL, Sept. 24.

It is understood that double-tracking the Bay Shore line has been a bone of contention between the people of Ocean View and the traction company for more than a decade and that at one time it was virtually written into an agreement with the city, and on many occasions has been the basis for bitter controversy. The present owners of the company placed this project on their regular expansion program and have just reached it on the schedule.

The City Council has approved a plan to exchange with the company a portion of the right-of-way of Granby Street from the Cottage toll road intersection at Lenox through to Ocean View proper, to enable the company to straighten its tracks at Lenox and to run down the middle of the boulevard. It gives up its present right-of-way on the west side of the concrete boulevard and makes it possible now for the street to be built with a double roadway from Lenox to the water. Otto Wells of Norfolk recently, it is reported, purchased practically all of the traction company property at the resort. Engineers of the city, traction company and of the Wells organization just now are at work on the final lines of the layout of trackage, street car stations and related facilities at Ocean View. Working in conjunction with this plan is City Manager Truxton of Norfolk.

Thomas P. Walker, vice-president of the Virginia Electric & Power Company, in charge of Portsmouth and Norfolk operations, with W. Jennings Crocker, local counsel for the company, conferred recently with City Manager Hanrahan of Portsmouth, Va., relative to the company's plans to remove abandoned tracks and replace pavement so destroyed. The company has completed similar work on Elm Avenue and several other streets and plans to start early next year on Court Street, between High and London Streets. The company is making rapid progress with its work on County Street, where the concrete pavement is being repaired and put in excellent condition.

Two-Million Dollar Car Order Placed by B.-M.T.

The Brooklyn-Manhattan Transit Corporation has placed an order for 50 triplex car units—equal to 150 single cars—amounting to $2,000,000, with the Pressed Steel Car Company, according to reports this week.

The total cost of the cars will be brought up to $4,000,000 after the motors, running gears and other equipment are purchased and installed. These cars are essentially the same as the 71 triplex units already in use by the company. The new order for 50 units when completed will bring the total number of this type equipment on the B.-M.T. up to 121. This is the second large order placed by it within the last two years.

Dallas Railway Completes Difficult Job

The Dallas Railway & Terminal Company, Dallas, Tex., has completed the work of rebuilding its tracks on Main Street and on Exposition Avenue, one of the major items in what is known as Everman Plan No. 4. A total of 4,880 ft. of double track line was rebuilt and concrete paving laid between the rails, at a cost of $89,790. During construction period cars using the Main Street line were routed down Commerce Street, which parallels Main Street and is only one block removed. Richard Meriwether, vice-president and general manager of the railway, said:

The rebuilding of the double tracks on Main Street and the laying of concrete paving between the rails presented many difficulties. Main Street carries very heavy traffic. Quick work and very little inter-

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ference with business along this street was necessary. The work was completed in 32 working days. Construction crews were organized into two shifts, which worked from 6 a.m. to 12:30 a.m. Three hundred men were employed on the two shifts. Our crews were instructed to keep the sides of the streets along the new construction work clear of débris, so that it was always possible to get into and out of the business houses along the street. At street intersections we used 50 per cent more cement than on other portions of the paving so the cross streets could be opened to traffic in shorter time.

The Main Street job required ten railroad cars of new 6-in. 100-lb. T-rail, ten carloads of new ties, one carload of tie plates, nearly 250 carloads of concrete, gravel and sand, which did not include the ballast salvaged from the torn-out old work. Ten street railway work trains were constantly employed.

Non-Ferrous Metals Have Good Week

Business is well up to the average in volume of sales and firmer prices were reported for all of the major non-ferrous metals in the week ended Nov. 23. Copper is up ¼ cent to 13.75 cents delivered; zinc advanced to 5.85 cents, an improvement of fifteen points; tin made a net gain of more than ½ cent, and lead is quotably a little higher in St. Louis.

An excellent business was done in domestic copper on Nov. 17, 18 and 19, with 13.625 cents in Connecticut and 13.75 cents for the Middle West destinations the prevailing prices. By Nov. 21 all of the sellers had advanced their price to the basis of 13.75 cents, Valley. The exporter's price was advanced to 14.05 cents, c.i.f., on Nov. 21.

A premium of from five to ten points for future zinc over the prices for spot and prompt metal has existed most of the week. High grade is quoted, nominally, at 7.75 cents for spot lots in New York.

Demand for lead has been excellent all week. In the East the American Smelting & Refining Company has made no change in its contract price of 6.25 cents, New York. In the Middle West, sellers found the demand sufficient to justify them in advancing prices above the 6-cent level.

The stronger tone in tin in London has brought both dealers and consumers into the domestic market. Spot and forward have sold at approximately the same prices most of the week, and 99 per cent grade has been but little below the price of Straits.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Nov. 22, 1927
Copper, electrolytic, cents per lb.	13.50
Copper wire, cents per lb.	15.25-15.50
Lead, cents per lb.	6.25
Zinc, cents per lb.	5.90
Tin, Straits, cents per lb.	58.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.075
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.55
Central, Ill., screenings, Chicago, net tons.	1.125
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.50
Weatherproof wire base, N.Y., cents per lb.	16.00
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.5
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.5450

Prices Considered of Interest to Industry Reprinted

From a table of commodity prices in a recent issue of the *Guaranty Survey*, published monthly by the Guaranty Trust Company of New York, prices considered of special interest to the industry on commodities, some of which are not given in our weekly tables, have been selected and are presented on this page (see table below). Pre-war prices, 1920, 1926 and 1927 are given.

ROLLING STOCK

TWIN CITY MOTOR BUS COMPANY, subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., has received two new street car type motor buses which it was recently announced would be put in operation shortly.

SHORE LINE MOTOR COACH COMPANY, Chicago, has recently accepted delivery of a Model 54 White six-cylinder bus for use between Detroit and South Bend in co-ordination with the electric line of the Chicago, South Shore & South Bend Railway between Chicago and South Bend. This bus is the "Golden Arrow," which was included in the White Company's exhibit at the American Electric Railway Association convention in Cleveland.

TRADE NOTES

W. L. HICHENS has been appointed chairman of the English Electric Company, in succession to P. J. Pybus, who has resigned in order to undertake other work. Mr. Pybus will remain a director of the company.

WADE ENGINEERING COMPANY, Los Angeles, Cal., which handles products of the Lincoln Electric Company, Cleveland, Ohio, announces that its Northern office has been moved from 69 Webster Street, Oakland, to 533-539 Market Street, San Francisco.

AMERICAN HAMMERED PISTON RING COMPANY has recently placed on the market an auto engine valve tester, called the Arico, which the manufacturer says is both inexpensive and very practical. It comprises a steel collar or socket in which is affixed a strong rubber bulb in the shape of a half ball. The testing operation, it is said, consists of placing the tester over the valve opening and that the pressure of a thumb or finger tells the story.

ADVERTISING LITERATURE

MET-L-WOOD CORPORATION, Chicago, has mailed an illustrated booklet featuring the construction and use of Met-L-Wood panels.

THE J. G. BRILL COMPANY, Philadelphia, Pa., has recently issued leaflet No. 318 and bulletin No. 319, descriptive of a new automatic slack adjuster (mechanical), and the Brill 1928 model electric car and Brill No. 277-ex type truck, respectively.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued looseleaf bulletins GEA-164-B and GEA-817, describing type R.P. metal-melting pots and equipment for metal melting pots, and battery-charging equipment.

Trend of Commodity Prices Affecting the Electric Railway Industry*

	1913 Average	1920 Average	1926 Average	October, 1926	September, 1927	October 1927
COTTON—Middling, New Orleans, per pound	0.127	0.330	0.168	0.128	0.210	0.211
WOOL—Ohio, fine delaine, unwashed, Boston, per pound	0.239	0.752	0.468	0.460	0.455	0.460
SILK—Japan, Kansai best No. 1 to extra, New York, per pound	3.64	8.64	6.14	6.09	5.10	4.90
COAL—Pocahontas, mine run, Norfolk, per long ton	3.00	6.28	5.42	7.37	4.32	4.17
PETROLEUM—Kansas-Oklahoma, 33-34.9° gravity, at wells, per barrel	0.93	3.40	1.89	2.05	1.23	1.23
PIG IRON— *Iron Age* composite price, per gross ton	14.68	42.76	20.26	19.69	18.00	17.84
STEEL—*Iron Age* composite price, per pound	0.0166	0.0367	0.0244	0.0245	0.0237	0.0231
COPPER—Electrolytic, New York, per pound	0.155	0.175	0.139	0.141	0.132	0.133
SULPHURIC ACID—66 deg., in tanks, New York, per pound	0.0100	0.0109	0.0076	0.0078	0.0078	0.0078
PAPER—Wrapping, manila, No. 1 jute, New York, per pound	0.049	0.147	0.110	0.091	0.092	0.092
RUBBER—Crude, ribbed smoked sheets, New York, per pound	0.820	0.363	0.486	0.427	0.342	0.341

Current quotations are as of the 15th of the month, or the nearest available date.
* Compiled from the *Guaranty Survey*.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, December 3, 1927 *Number 23*

Evidence Continues to Accumulate

DURING the past two years increasing attention has been given to the condition of electric railway equipment. Railway managements throughout the country are generally alert to the need for retiring obsolete cars and to the advantages to be obtained from cars that are more in keeping with present-day conditions and transportation standards.

When it comes to the matter of transposing this interest into action, however, a somewhat different situation is encountered. The operating management finds difficulty in presenting the case for new cars in terms convincing to the men who put up the money. Some of the most important advantages of new cars are intangible. These include such items as their effect on the public's general attitude toward the company, the attitude of trainmen toward their jobs and the effect which improved equipment may have on the volume of riding.

Much information and data have become available to prove that these advantages have actually accrued in many cities that have gone ahead with car improvement programs. Two articles in this issue, recording the experiences of the Virginia Electric & Power Company and the Houston Electric Company, give eloquent testimony in favor of improved equipment.

Though it is a difficult selling job to convince a conservative group of directors that new cars on their property would more than pay their way, the volume of evidence which has been accumulated in favor of the case for better electric railway equipment is imposing. The alert railway manager who collects and digests this evidence can use it effectively in the effort to get better equipment on his own property.

Demand for Beauty and Style Are Irresistible

FOR nineteen years Henry Ford built and sold a standard product. Embodied were many of the virtues upon which the engineers like to dwell. Its cost of operation was relatively low. Its maintenance cost was likewise below that of more pretentious cars. The Ford established a good reputation as a car that would take you there and bring you back. Its entire appeal in comparison with competitive automobiles was on the basis of reliability and economy.

When it was brought out there was little reason to worry much about the appearance of the Ford car. It was essentially democratic in its unpretentiousness. But nineteen years is a long time measured in terms of the changes in taste that have taken place since the turn of the century.

Public transportation has undergone many changes, some more fundamental than any yet experienced by the automobile. From horse car, to cable, to trolley was indeed a metamorphosis. Accompanying this development there came about, also, changes in people's travel habits and ways of living. It is no exaggeration to say that the growth of modern cities as we know them today was dependent on having available fast, dependable and economical public transportation.

The wheel of time never stops in its turning. The very causes of change are themselves affected by the forces which they loosen. So it is with the automobile, creator of the demand for greater speed and luxury.

Just as the automobile itself worked a revolutionary change in the travel habits of this and other countries, so has it in turn been affected by the march of time. Even Ford, the original and last disciple of economy and utilitarianism as the guiding principles in automobile manufacture, succumbs at last to the demand for beauty and style in travel.

Utility and economy are still the determining factors in the success of a public transportation system. But the growing demand for style and speed seems to be irresistible, and affects every means of travel—public as well as private.

Small Systems Can Be Made to Pay

PROGRESSIVE management, in the final analysis, must be recognized as the necessary impetus to make a property, large or small, show a satisfactory earnings statement. With it the problem is relatively easy; without it little or nothing can be accomplished. Mere bigness in itself is a help in making both ends meet, but even on the largest properties mistaken policies frequently have led to disaster. On the small property there is little, if any, leeway. The management must be ever on the alert to grasp every means of improving conditions and must leave no stone unturned to uncover sources of revenue and means of reducing expense.

The record of the Durham Public Service Company, as published in the issue of this paper for Nov. 26, is of particular interest to managements in small cities confronted with difficult problems. Here is a city of only 45,000 inhabitants, with a railway system that had been allowed to run down until there was not even enough revenue to cover operating expenses, let alone provide for deferred maintenance. Some car routes were rendering a needed service, while others showed heavy traffic losses with little hope of regaining the business.

Faced with this serious situation the management made a number of radical changes. Some of the car routes were abandoned entirely and the cost of track maintenance saved. Buses were substituted and so routed that they gave a service that pleased the patrons. New territory which had developed was served by the buses, and special routing in the rush hours permitted greater efficiency in handling many of the workers, besides keeping them off the regular cars. Modern cars were introduced on the rail lines that were retained. These made a marked improvement.

Best of all, these changes brought increased revenue. From a low point of $147,074 gross revenue in 1925, the

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revenue has gone up to more than $200,000 for the current year, an increase of 36 per cent. The changes were so well planned that the operating expenses in the same time have increased only from $152,919 to $177,840, or 17 per cent. Accordingly the net result has changed from an operating deficit of $5,845 in 1925 to a balance of $22,410 for this year.

Results of this sort are an effective refutation of the statement so often made that an electric railway system—or in fact any public transportation—cannot succeed in a small city. It shows that quality of service and a willingness to give the public what it wants and needs are the real bases of success, and that the handicaps incident to small size can, at least in some instances, be overcome.

An Interesting Parallel Drawn by Mr. Mencken

H L. MENCKEN, editor of the *American Mercury*, has done utilities, but particularly the electric railways, a real service in an article "The Banks and Their Customers," contributed by him to the Baltimore *Sun*. It may at first seem a far cry from this subject to that of the utilities, but Mr. Mencken makes the transition with all the writing grace so characteristic of the man.

After saying that no man wants to put his money into a bank that is not making money he slips over into a consideration of the matter of the right of the United Railways & Electric Company to an adequate fare. He admits he is discreetly silent about the original financing of the company, but he asks why the desire predominates in some quarters to try to remedy a situation he considers bad by making the stock worth even less than it is today and by carrying the funded debt along with it. The questions he wants answered are how the company is going to improve its service without money, and how is it going to get any money without selling either stock or more bonds. According to Mr. Mencken, the villainy of corporations, and especially public service corporations, is greatly exaggerated. He thinks the Public Service Commission as a regulatory device sufficiently well endowed to sit on any predatory corporation impulses.

Similar things have been said before, but not just the way Mr. Mencken has done it. As he sees it the United Railways needs help out of the mud, not another shove into it. The point he makes is incontrovertible that if the United were better off it could afford to make all of the improvements its critics bawl for—and many more. It could get money for them at low rates. Its securities would be selling at higher prices. Investors would be eager to support it. Now they steer clear of it and it is pegging along on one leg, and "the marvel is that it is able to operate its cars at all."

The company does, of course, need help badly. There is no doubt of that, although there is a little bit of exaggeration in the Mencken manner, particularly in his colorful portrayal of the railway's plight. But all that he says is essentially true. One cannot, as the late Elbert Hubbard said, feed calves a mixture of chalk and water and expect them to thrive. Yet far too often the public utility calf has been expected to thrive on just such substitute for a substantial fodder in the form of an adequate fare. The difficult job is to make the men understand this who try to do business on a working capital of $70. And, as Mr. Mencken says, they are the fellows who make a great deal of noise.

Knoxville Should Watch Its Step

EMINENTLY fair is the opposition of the Knoxville Power & Light Company, Knoxville, Tenn., to the threatened program of competition by bus by the Knoxville Rapid Transit Company. The railway has stated its case clearly and forcefully, but with no hint of retaliation. It is going ahead with its program of improvements just as if nothing had happened and proposes to proceed with its plan to cut its rates for light and power.

Some persons might be inclined to ask what the one has to do with the other. Theoretically, nothing; but practically, everything. If the city were playing as fair with the company as the company is with the city, the city would not even entertain the bus proposal, much less advance it beyond first reading in the council, as was recently done. This is not a defense of the company; it is just common sense. There is no service that the proposed bus operator can perform which the railway at Knoxville cannot perform equally as well, if not actually better. It is co-ordination, not competition, that is needed.

If the city of Knoxville is not prepared to play fair with its railway, then what assurance has the newcomer that the city will play fair with him? It may seem like anticipating events to assume that the city has it in mind to do anything but play fair with its railway, but cities have been foolish in the past. The railways have passed through the cycle of the horse car, the cable car and the trolley, each in turn. They must progress where they are to survive.

Substitution and competition do not spell progress. They spell ruination. Knoxville can have what it wants, but it is not on the right road when it does not first exhaust the means which it has at hand in securing what it wants from a responsible agent. And the responsible agent in this case is the Knoxville Power & Light Company. The city knows what it has got in that institution. It does not know what it may get. But even if the company which is seeking a foothold in that city were able to live up to every promise which it has made the city would still be the loser. That is an incontrovertible fact.

Piedmont Case Involves Question of Jurisdiction of I.C.C.

MANY reasons exist for interest on the part of both steam railroads and electric railways in the oral arguments to be presented before the Interstate Commerce Commission at Washington on Dec. 9 on the application of the Piedmont & Northern Railway for a certificate authorizing the construction of two extensions of its electric lines in North and South Carolina. The program of that road calls for the expenditure of more than $20,000,000. It is an important case on that account alone. But more than that, very grave questions about the authority of the commission appear to be at stake. At least three steam railroads are opposed to the granting of the application, and the examiner for the commission who heard the case originally has recommended that the application be denied.

It is a long story, the history of this case, but some of the facts regarded as essential to an intelligent understanding of the matter are worth recapitulating. The Piedmont & Northern, an electric road tied in with the Duke power interests, has a network of tracks which serve virtually the entire rich Piedmont area of South

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Carolina. The road seeks to penetrate the valuable textile and tobacco region of North Carolina. The case arose when the Interstate Commerce Commission asked the company if it intended to seek the authority of that body to make the extensions. The road then filed its application. Some time later it sought to have the application dismissed, arguing that the commission was without jurisdiction. It held that it was not operated as a part or parts of a general railroad system and was therefore, by paragraph 22 of section 1 of the interstate commerce act, expressly excluded from the operations of paragraphs 18 and 21 of section 1, under which the commission grants certificates of convenience and necessity. Other points that it made, also points made by the opposition, were reviewed in ELECTRIC RAILWAY JOURNAL for Sept. 3, page 407.

Views similar to those of the electric railway appear to be held by the National Association of Railroad and Utilities Commissioners. That body contends the act of Congress creating the Interstate Commerce Commission eliminated spur tracks, electric interurbans and industrial sidings from the jurisdiction of the commission. The commission itself previously has been on record in rate cases that where the service on electric lines in interstate commerce was essentially local in character the problem of regulation was a local one. The question of "state rights" is even said to be involved.

Eminent counsel, headed by Charles Evans Hughes, will appear for the electric line. Regardless of the Interstate Commerce Commission decision, the case appears to be headed ultimately for the United States Supreme Court. Should the commission hold that it lacks jurisdiction, it seems likely that the steam lines will appeal. On the other hand, if the application is refused, as the commission's examiner has recommended, the Piedmont & Northern will undoubtedly appeal to the highest courts, after the case goes through the lower courts. The likelihood of similar situations arising in the future seems remote, but it does appear probable that the question of jurisdiction now raised will be settled once and for all.

Better Advertising Copy Is Better Selling

UNANIMOUS indorsement of the Better Copy Contest inaugurated by the Public Utilities Advertising Association is a foregone conclusion. For who is there with mind so sluggish that doesn't see the danger in advertising copy that either boasts vainglorioously, makes subtle comparisons or deteriorates into mere words? Advertising in the public utility field has been developing fast. It is to encourage continued development and to award recognition to outstanding advertisements that the Better Copy Contest, referred to elsewhere in this issue, is under way.

It is inconceivable in these enlightened days for any railway to presume to "carry on" without a well-planned advertising campaign—modest financially though it may of necessity be in some cases. Most companies realize that it pays to advertise when the messages contain ideas executed consistently and persistently. Still "mere" copy, no matter how often repeated, will not win the man in the street or the private automobile owner.

It is not intended that this should be a treatise on the elements of advertising copy, but the opening of this contest presupposes recognition that the fundamentals of advertising to sell rides or any other utility service are inherently the same as those for selling soap—that "rides" is a product the need of which the potential buyer must feel. But in addition to poising his copy from the merchandise angle, the utility advertising man must appreciate the psychology of the rider.

It is generally accepted as an advertising principle that suggesting one brand of goods for another won't win customers. Quality, service and even "super-service" must be sold. Advertising experts warn against selling the copy rather than the product, against demanding instead of inducing and against exaggeration and boasting. And herein is the epitome of good advertising appeal. At a recent round-table discussion advertising men expressed the view that 85 per cent of general copy today is bad, 10 per cent is good and 5 per cent excellent. It is to place utility advertising copy and especially railway advertisements definitely and unequivocally in the excellent class that electric railway men should get back of this movement to stimulate better advertising through this contest.

Avoid "Iron and Concrete" Mistakes

WHILE at a great distance from our own country, one of the best rapid transit systems in the world exists in Sydney, New South Wales, Australia. Being on the opposite side of the globe, it is difficult to conceive of rapid transit in such a far-off land, yet this Australian system, described in the Nov. 26 issue of this paper, is a model after which any city might profitably pattern.

Too often have designers of rapid transit systems lacked foresight. A few subways have been planned and built which were able to accommodate the population for several years, but often they have proved inadequate within a short period. Any subway line of New York City will serve as an example of this.

Constructed of steel and concrete as they are, it is difficult or impossible to alter stations and tracks to relieve congestion. The Sydney City Railway, aware of the fact, profited by the experiences and the mistakes of others and arranged the stations, tracks and crossings to permit the use of an increasing number of trains for years and years. Furthermore, extensions were planned at the outset to join the lines being built and the entire system was laid out accordingly.

Modern in every respect and embodying many new construction features, it portrays the result of long study and thought.

"Flyover" junctions to prevent crossing of tracks at grade are used extensively by the Sydney systems. In one station alone fourteen crossovers are used.

Stations, too, were planned for efficient operation and have been provided with sufficient tracks and island platforms to accommodate all trains without duplication of car routes. The Central Station, for example, has eight tracks and four platforms to handle the suburban and local lines of both directions. By way of comparison, the Times Square station on the west side line of the Interborough Rapid Transit Company and the Grand Central Terminal station on the east side line of the same system, handling more passengers than any other subway stations in New York City, each has but four tracks and only two island platforms. The Sydney stations are also characterized by large platforms and ramps for entrance and exit. They have been designed to handle a large number of passengers in excess of the present normal flow.

Designers of new rapid transit systems can well profit, as did the designers of the Sydney, Australia, system, by avoiding the mistakes committed by others in the past—mistakes sealed in iron and concrete, not to be corrected.

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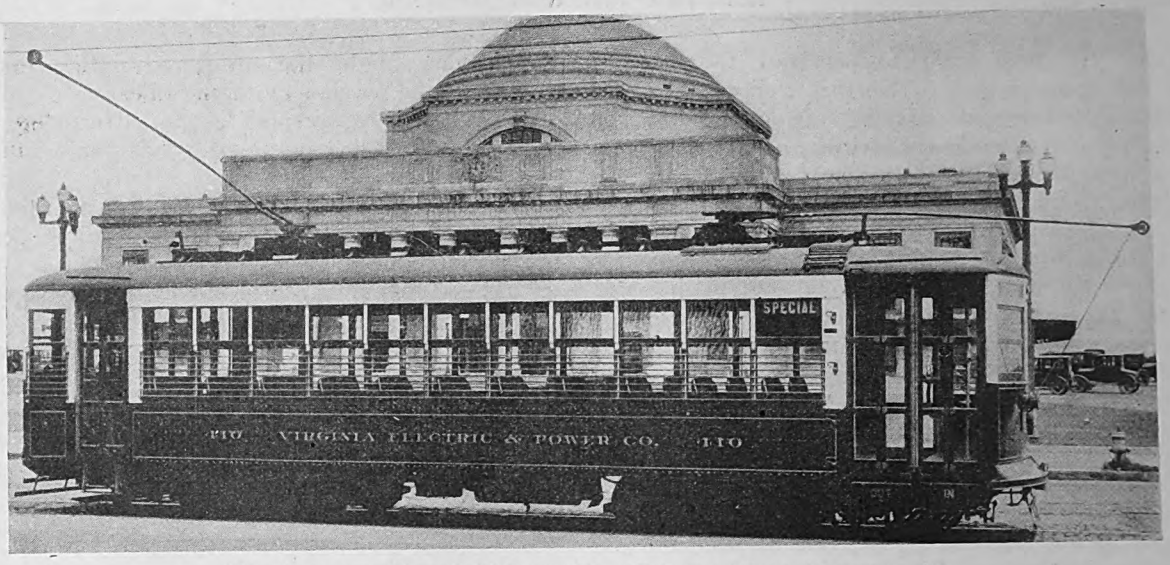

The latest type of car in Richmond is a distinct credit to the community

Improved Service Pays

in Eastern Virginia

In little more than a year the Virginia Electric & Power Company, under Stone & Webster management, has completely reversed public opinion in Richmond, Norfolk, Portsmouth and Petersburg

CORPORATE descendant of the first commercially successful street railway in the world, the Virginia Electric & Power Company has in a measure inherited the responsibility which attaches to a pioneer and to his progeny as well. Ever since that day in 1888 when admiring and awestruck citizens of Richmond saw Sprague's crude street car run past the historic Ballard and Exchange Hotel and on up Franklin and Bank Streets, they have expected and demanded much of their local transportation companies. Add to this a keen rivalry, not unmixed with jealousy, on the part of citizens of several communities served by a common utility company, sharply drawn social lines in an atmosphere of Southern aristocracy and growing industrial activity, the race problem, rugged, irregular topography presenting steep grades and necessitating circuitous routes, and there is formed a rough outline of the basic conditions with which it has been necessary to contend in the historic Virginia cities of Richmond, Norfolk, Portsmouth and Petersburg. These properties were for many years beset with public misunderstanding, bitterness and financial difficulties. Yet since July 1, 1925, when they were acquired by the present owners and organized into the

"Esprit de corps" is the direct object of the relations between management and employees of the Virginia Electric & Power Company. Here is a representative group of trainmen arrayed in their lightweight gray summer uniforms and white duck caps.

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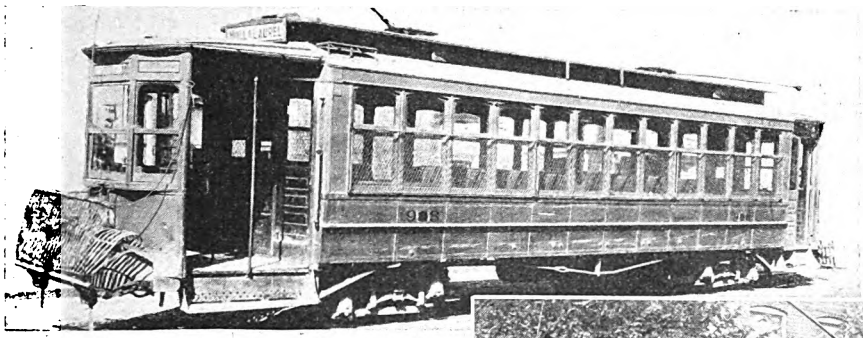
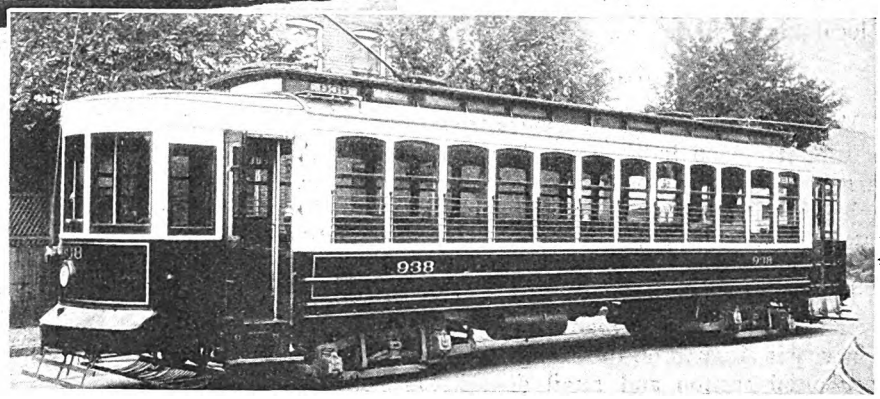
Virginia Electric & Power Company, there has been an almost complete reversal of public attitude toward the transportation company in each of these cities. Bitterness and bickering have given way to growing good will and understanding between the company and its patrons. As a direct result there is a marked improvement in the financial outlook for the property, and every indication that those who had faith in the possibilities of these transportation lines stand to profit substantially from their investment.

In determining the underlying reasons for this complete change in the situation, one needs to look little further than the present management's formula of "being doers of the word and not promisers," which has been so successfully applied by the same interests on several other Southern properties.

Going back for a moment to get a closer insight into the conditions which existed when Stone & Webster took hold of these properties in the Old Dominion, one must return to the general public attitude toward transportation in Richmond and its neighboring cities. During early promotional days there had been ill-advised over-construction of lines by competing companies, until the railway mileage was far out of proportion to the density of population. Inevitably, consolidations and receiverships followed; yet the public would not permit the discontinuance of any of the lines. Under the régime of the Virginia Railway & Power Company, the predecessor of the present company, the properties in Norfolk and Portsmouth had been acquired, and with them a rivalry between the citizens of Tidewater and Piedmont, Va., old as the state itself. Petersburg, 22 miles south of Richmond, had been part of the group long before the Tidewater utilities were added. The holdings also included the Richmond & Petersburg Electric Railway, an interurban line.





An example of results accomplished in the effort to make street cars in Richmond more attractive. An exit treadle is provided at the rear of the rehabilitated car

The situation of the property on July 1, 1925, was described as follows by an executive familiar with its history and details:

> Many operations had been performed on it and it had suffered many relapses, the consequence of which was that the public had grown weary of hoping that the patient would recover. The company had a valuation made of its physical properties, and succeeded in having the State Corporation Commission fix and recognize a fair value on each of its several railway divisions and on its entire light and power system. It also had been successful in having the matter of fares on its railway divisions taken out of the hands of the local city councils and placed under the jurisdiction of the State Commission, this latter move having been carried through the courts and finally confirmed by the Supreme Court of Virginia.

But as a corrollary to this litigation, ill feeling sprang up between the various city councils which resulted in deadlocking these bodies in the matter of franchise negotiations so that matters dragged in each of the several cities over a long period—since 1909 in Richmond. Meanwhile, the company also had been conducting a campaign against jitney and competing bus operation, which incurred the antagonism of many who found these vehicles convenient and rapid forms of transportation. To offset losses created by jitney and private bus line competition, a number of railway lines were abandoned, principally in Norfolk and Portsmouth, where the losses were greatest, and increased fares were urged and obtained through the State Commission, thus further vexing an already irritated public. To add fuel to the flames, a strike was called in 1922 on all the railway lines. This was won by the company. But again there was a bad aftermath. Unfriendly labor elements employed their influence in the various councils to the end that action on applications for franchises, rerouting, jitney elimination and other legislative matters was postponed and delayed. Public ill will accompanied the general confusion and the press added its note of censure. There was general dissatisfaction in the tidewater cities with a service that was being controlled and directed altogether from one city, Richmond.

In the midst of this travail was born the Virginia Electric & Power Company, under the executive management of Stone & Webster. The new management set about demonstrating once more—as it has already demonstrated in many other cities—that public support and co-operation, so essential to success, can be won through straightforward dealing and efficient operation despite past prejudices and misunderstandings. In the short period of little more than a year there has been worked a marked transformation in transportation conditions in these Old Dominion communities.

Soon after the new management took hold an executive vice-president was located in Norfolk to handle affairs in that city and in Portsmouth. A claim department was set up in the seaside city, thereby removing one of the old bones of contention, i.e., that Norfolk and Portsmouth claims were settled in Richmond. Further harmony was

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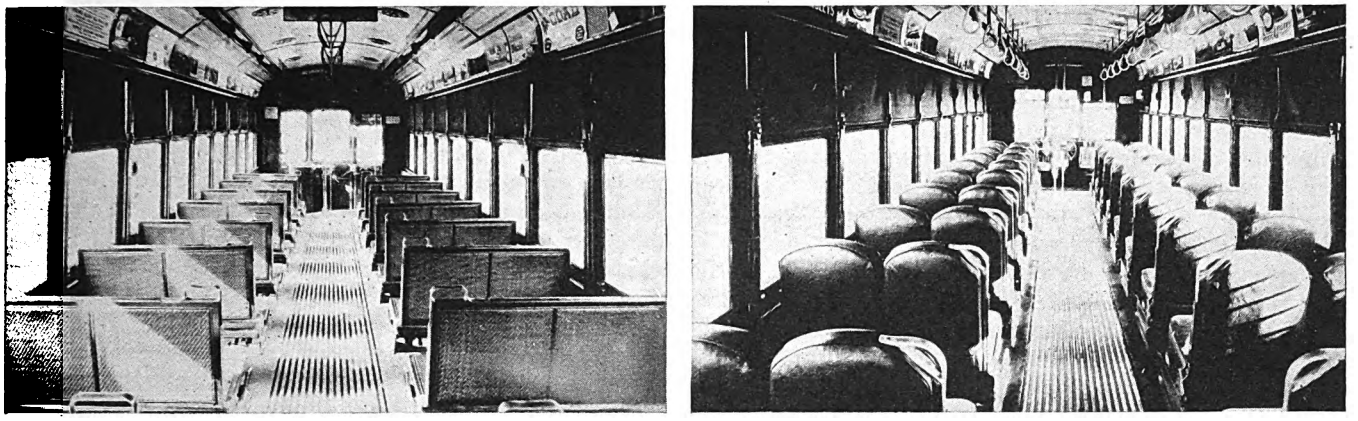


Here is an example of how the program of modernization was applied to the interior of Norfolk's "1100" type cars. Hard cane and wood seats gave way to leather-cushioned comfort

tras in the evening rush period, respectively 86 per cent and 93 per cent increase over the former service. On the five other routes which reach out into every nook and corner of the city and which encountered stiff gradients there are 28 buses in the base service. Ten additional buses are operated in the morning and eleven in the evening peak hours. An accompanying map shows how completely this service covers the city while at the same time eliminating much former duplication of routes and waste mileage. Rearrangement and rerouting of rail lines resulted in the abandonment of 5 miles of track and the construction of 10 miles of extensions.

Briefly stated, the franchise proposal included a unified system with 35 additional miles of bus routes giving a total of 106 unified miles of route for a maximum fare of 8 cents; a 7-cent car fare with 1-cent transfer car to bus, and an 8-cent bus fare. On May 25, 1926, the Richmond City Council granted a 30-year franchise, overriding the Mayor's veto and making the document official as of Aug. 19, 1926. Thus there was obtained in less than a year an agreement that had been sought since 1909.

A measure of the effect of the improvements made upon the patronage in Richmond is given by the following figures:

RICHMOND RIDING AND REVENUE FOR FIVE YEARS

	Revenue		Gross Riding
1922	$2,087,366		47,093,144
1923	2,493,541		56,074,296
1924	2,488,003		55,282,316
1925	*2,638,278		*53,081,943
1926	3,075,536	Car... 49,460,119 Bus... 6,678,352	56,138,471

* Sept. 15, 1925, the Richmond Rapid Transit Corporation buses were acquired.

When examining these figures, one must bear in mind a number of factors: Touring car jitney competition, in 1922, was reduced almost 400 per cent by an ordinance of June 8, 1922, which confined such operations to the western "fan" residential area not conveniently covered by street cars; a 6-cent fare until Sept. 1, 1926, a 7-cent fare thereafter; bus fare at 8 cents and 1 cent for trolley to bus transfer. The figures for the first five months of 1927 show a continued improvement:

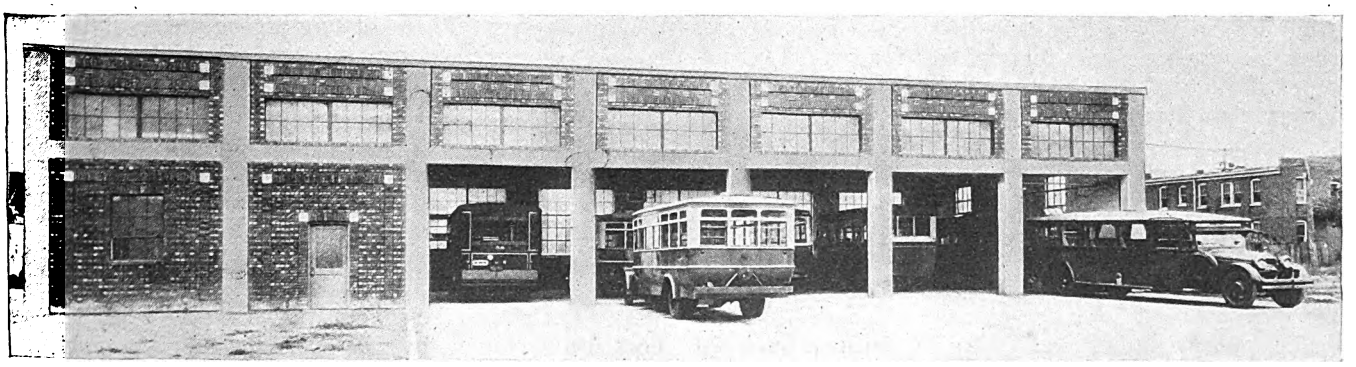
RICHMOND GROSS RIDING BY MONTHS

	1927	1926
January	4,710,658	4,142,405
February	4,255,614	3,860,945
March	4,696,864	4,354,750
April	4,647,669	4,265,179
May	4,641,048	4,379,827
Total	22,951,853	21,003,106

Comparing these passenger totals with those of the revenue totals for the same five months period, i.e., $1,299,070 (1927) and $1,310,151 (1926), reveals an increase in riding and a slight drop in revenue, attributed to the more liberal transfer system and to the fact that improved bus facilities drew more riders in the residential districts. Bus riding in 1926 was 12 per cent of the total as against 18 per cent in the same five months of 1927.

Reversing Public Opinion in Norfolk

The situation in Norfolk was in some respects similar to that in Richmond. The predecessor company had been operating the property of the Norfolk Railway & Light Company, whose 99-year lease dates from June, 1906. Jitney competition was running wild all over the city—at one time there were 250 passenger cars and buses, with



The company's buses are housed in modern brick and concrete garages of this type

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separate service for the colored population, the buses in this case manned by negro operators. This competition represented 25 per cent of the total traffic. Under date of July 18, 1921, an ordinance was drawn by A. Merritt Taylor, City Manager, which, though it contemplated the elimination of jitneys, included requirements for future track extension and maintenance expenditures which were considered by the company to be dangerous. In 1924, failing to obtain curtailment of bus competition, rail service was curtailed. This led the city to look with favor upon extension of the competing bus service. The situation became further involved by the company's plea for a further cut in service and its effort to get paving relief. Behind all this was the public's antipathy toward a Richmond-dictated operation.

This was about the situation when the new management took hold. The first step was the adoption of a policy of frank discussion of the wastefulness of competition and an effort to determine just what kind of a transportation system would be in the city's best interest. An ordinance was soon passed providing for unified operation of cars and buses. Some of the independent routes were purchased at values determined by the city.

On Oct. 26, 1926, an ordinance was passed which authorized the abandonment of 36.82 car route-miles. A rerouting and building program was undertaken which involved an expenditure of $750,000. As in the case of Richmond, particular attention was paid to the improvement of cars. Sixteen cars of the double-end, two-man type were converted for one-man operation with an exit treadle. Twin leather seats with air cushions replaced rattan-wooden seats. A 26-in. aisle was provided. Stanchions and grab handles of aluminum were installed, as were air-operated fare boxes and window wipers. The control was changed to the chair-level type K-75. Automatic slack adjusters and variable load brakes, concealed brake control and door-control piping and door engines set in cabinets over the doors are some of the other refinements on these cars. The rehabilitation cost per car was approximately $6,000. In addition to this rehabilitation, the company purchased ten new 43-ft. treadle-exit cars which were delivered in the late spring, and which included 35-hp. motors and genuine leather-upholstered twin-design spring seats, space 30-in. centers. The specifications also called for concealment of all control apparatus and valve piping. Electric heaters were installed in the valve boxes to prevent cold weather troubles.

Bus service was likewise modernized in Norfolk. There are now in use there twenty-five 29-passenger buses with treadle rear doors, plush or leather seats and metal shoe air brakes; five 25-passenger vehicles with similar equipment, and twenty-six 21-seat units.

Parades, in which civic leaders joined enthusiastically, marked the installation of new buses in Richmond and Petersburg

Experiments with the seating arrangement of the Birney cars in service on the property were made. This was dictated by dissatisfaction resulting from the mixing of white and colored passengers. Finally it was found that transverse seats on one side of the cars and a long bench on the other side were acceptable to the public. The operators on former negro buses were changed to white employees. The white patrons are now using these buses, particularly since they were equipped with rear treadle doors.

In the track construction, dirt and cinder ballast has been succeeded by crushed stone and slag. Bronze bonds, creosoted wood ties and twin steel ties, thermit welding and 122-lb. A.E.R.A. rail are being used.

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A comparison of operating results in Norfolk for the past five years is given by the following figures:

NORFOLK REVENUE OVER FIVE YEARS

	Revenue from Transportation	Net After Operating Expenses	Vehicle-Miles
1922	$1,643,581	$483,713	5,465,310
1923	1,697,178	592,272	5,549,964
1924	1,581,650	529,348	5,429,982
1925	1,512,722	505,722	5,292,585
1926	*1,970,480	350,015	8,746,616

* Revenue from acquired buses $462,466.
Large drop in net due to deficit on these buses.

Notes: 1. 7 to 6 cents fare changed February, 1922.
2. June 10, 1923—6¼-cent token, 7 cents cash, and 2½ cents school.
3. Bus earnings not a factor until 1926, when there were 3,425,096 bus-miles, representing 40 per cent of total mileage and carrying 21 per cent of passengers.

On Jan. 1, 1927, fares for adults were changed from 6¼ to 7 cents for one trolley zone, also from 5 cents on the negro and 7 cents on the white buses to 8⅓ cents (or three tokens for 25 cents). A $1.50 transferable weekly pass without restrictions was adopted. The effect of these changes is shown in the following tabulation:

NORFOLK PASSENGER REVENUE COMPARISON, JANUARY TO MAY, 1926-1927

	1927	1926	Increase 1927, Per Cent
January	$172,735	$145,952	18
February	160,967	147,995	9
March	181,010	160,392	13
April	188,935	164,103	15
May	191,636	169,745	13
	$895,283	$788,187	14

Note: Operating revenue: 75 per cent railway, 25 per cent bus.

GROSS RIDES IN NORFOLK, JANUARY TO MAY, 1926-27

	1927	1926*	Increase, Per Cent
January	3,095,356	2,637,737	17
February	2,869,338	2,699,668	6
March	3,149,323	2,955,386	6
April	3,291,905	2,999,034	10
May	3,069,494	2,751,223	12
	15,475,416	14,043,048	10

Notes: *1. In 1926 figures multiple zone rides were counted two or three times, against one count under new plan. This condition made extra rides 9.5 per cent of total in 1926.
2. Five months, 1926—Buses 39 per cent of mileage, 22 per cent rides. 1927—33 per cent bus-miles, 25 per cent rides.
3. Average gross passengers per bus-mile 2.2 to 3.6.
4. January, 1927, figures high due to fact that all jitneys had not been taken over in January, 1926.

Portsmouth Problem Difficult

In many respects the Portsmouth problem was the most difficult faced by the new management. The three outstanding factors were: Long controversy over paving on main thoroughfare; abandonment of three routes in 1924 authorized by State Commission because of tremendous bus competition, which was increased after the strike in 1922 by the participation of ex-carmen in bus operation; strong labor community and insistence by city that the old company comply with paving provisions of its franchise.

The new management offered $130,000 for the paving program and track construction. It purchased the independent bus operations, paying on the basis of physical valuation. In addition, many of the old operators were retained. In a little more than a year an ordinance was passed by the city council which provides for monopoly of transportation in the city, co-ordination of cars and buses, changes in rates of fare, and reduction of the paving obligation to the point where the company only furnishes the concrete foundation under its track area.

An abandoned single-track line in a high-grade residential section of Portsmouth has been replaced with a busy double-track line

Five new cars for one-man operation with exit treadles, genuine leather seats, K-75 chair-level control, air-operated fare boxes and safety car equipment were purchased. Portsmouth later was apportioned five of the 21-passenger buses purchased by the company. This new equipment had a strong effect in the complete reversal of public opinion toward the company.

As in the case of Richmond and Norfolk, a comparison of revenue for 1926 and 1927 shows the direct effect of the improvements that were made.

PORTSMOUTH OPERATING REVENUE

	1927	1926
January	$40,645	$18,657
February	35,838	17,009
March	39,283	17,830
April	40,053	18,779
May	41,098	18,149
	$196,917	$90,424

Note: No buses were operated until August, 1926.

REVENUE AND GROSS RIDES IN PORTSMOUTH

	Revenue	Gross Rides
1922	$200,735	3,794,393
1923	260,617	4,974,173
1924	219,285	4,241,174
1925	205,722	3,988,939
1926	310,920	4,585,027

Note: 1922, strike. 1923–1925, growing bus competition.

On entering the scene at Petersburg, a conservative old Southern city, with fine homes and with one highly

The new electric building and interurban terminal in Petersburg is a distinct civic improvement

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restricted suburban residential section, the management found the Walnut Hill exclusive suburb residents objecting to the operation of a trackless trolley system. There was likewise a demand for a bus service to Colonial Heights.

Again the procedure was to act first and talk afterward. A bus service was established to Walnut Hill and Colonial Heights. Track extensions were made on Halifax Street and improvements made to the equipment of the safety cars.

The citizens responded on Nov. 16, 1926, through an ordinance effective Jan. 1, 1927, which extended the franchise 30 years, confined the paving obligation to restoration, and abolished bus competition on Halifax Street. The city approved an application to the Corporation Commission for an increase in fare from 6 cents to 6¼-7 cents with a 3½-cent school fare. This ruling abolished a second fare on a line serving Matoca, a suburb.

Meanwhile, the company addressed itself to improving the interurban service of the Richmond & Petersburg Electric Railway. A competitive bus line was purchased and co-ordinated with the rail service. At present, four round trips of the limited trains are replaced by five express buses on a 60-minute schedule for the 22 miles. The remaining limited trains are now on a 67-70-minute schedule. Fares are: Bus, 75 cents straight; railway, one way with transfer, Petersburg-Richmond, 60 cents; Richmond-Petersburg, 67 cents, 5 cents less if tickets are bought at terminals. A 50-ride book is sold for $16.50.

The following figures show the operating results in Petersburg during the five years from 1922 to 1926:

	Revenue	Gross Rides
1922	$193,086	4,248,783
1923	203,352	4,596,993
1924	183,963	4,011,854
1925	168,547	3,471,806
1926	154,800	2,898,942

With unified service and buses on the streets for the first time June 1, 1927, results for the first five months of 1927 in comparison with 1926 were as follows:

PETERSBURG REVENUE BY MONTHS, 1927 AND 1926

	1927	Bus Proportion	1926
January	$14,996	$4,145	$13,069
February	13,571	3,537	12,503
March	14,926	3,791	13,311
April	14,854	3,618	13,190
May	14,570	3,646	13,184
	$72,917		$65,257

The consolidated figures for the entire property show the combined effect of the changes that were made in these four cities. The comparison is between the first five months of 1927 and the corresponding months of 1925, just before the property changed hands.

TRANSPORTATION

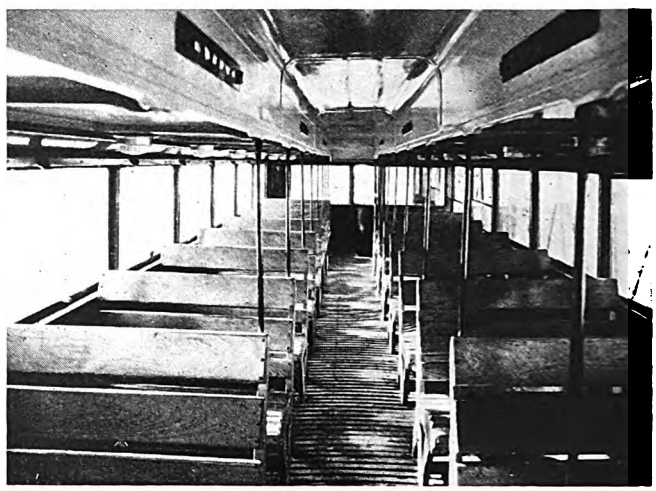
	Gross Earnings		Net Earnings	
	1927	1925	1927	1925
January	$517,459	$369,700	$149,656	$108,873
February	471,099	355,601	148,320	111,797
March	521,414	385,880	167,543	122,167
April	529,751	385,221	189,796	123,926
May	530,321	395,201	188,882	137,655
	$2,570,044	$1,891,603	$844,197	$604,419

These figures indicate an increase in gross of 36 per cent and in net of 40 per cent.

Closed Top for Double-Deck Bus

CLOSED-IN tops for the upper decks of its double-deck buses has been developed by Mitten Management, Inc. This provides complete protection from the weather. For experimental purposes one of the new tops has been placed on a Penn-Jersey Route 3 bus. If the top meets with the approval of bus riders and proves effective in operation it will be made standard equipment over the Penn-Jersey system wherever double-deck buses are used.

Penn-Jersey lines were chosen for this experiment for three reasons. The long open run over the bridge subjects passengers to unusual severity of wind and weather.



Upper deck of bus with closed-in top

Bridge service is in the nature of a "terminal-to-terminal" ride and does not require frequent loading and unloading as do the city lines. The bridge buses do not pass under any low viaducts along their routes.

If the Penn-Jersey experiment proves successful it will be followed by the appearance of fully inclosed buses on Route C, operating on Broad Street, Philadelphia, and on the entire city double-deck bus system whenever and wherever conditions will permit.

The new top has been developed in response to the suggestions of the regular riders of double-deck buses, who find upper-deck riding less attractive in winter weather than during the summer. Accordingly the opinion of passengers riding on buses equipped with closed-in tops will be sought with information blanks.

Public Service of New Jersey Has Extensive Telephone System

SEVENTY-FIVE thousand telephone calls daily made through 33 exchanges in various parts of the state of New Jersey with 2,500 extension stations represent the magnitude of the telephone business of the Public Service Corporation. In addition to the general exchanges, which are connected with 275 central telephone office trunks, Public Service has a number of special-type exchanges, such as dial exchanges at the Kearny and Essex stations, load dispatching exchanges of the electric generation department in the Newark Terminal building and in Burlington and telephone order-receiving systems in the commercial offices in Newark, Jersey City, West New York, Paterson, Passaic, Trenton and Camden.

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London Is Establishing a Policy on

TRANSIT EXPANSION

Report of advisory committee urges establishment of common fund and common management for all properties in London district. Public control considered also necessary

LONDON, like New York, is seeking a way to encourage the improvement and extension of its local transit facilities. While the subject is an old one in London, little was done officially until the passage of the London traffic act in 1924. This authorized the Minister of Transport to appoint a traffic advisory committee to consider the subject. Up to this time the existing systems have been allowed to develop as best they might, a large part of the street railway system being operated by the County of London, and the greater part of the bus and underground railway system, with some of the street railways in the suburbs, being operated by private initiative under a common management.

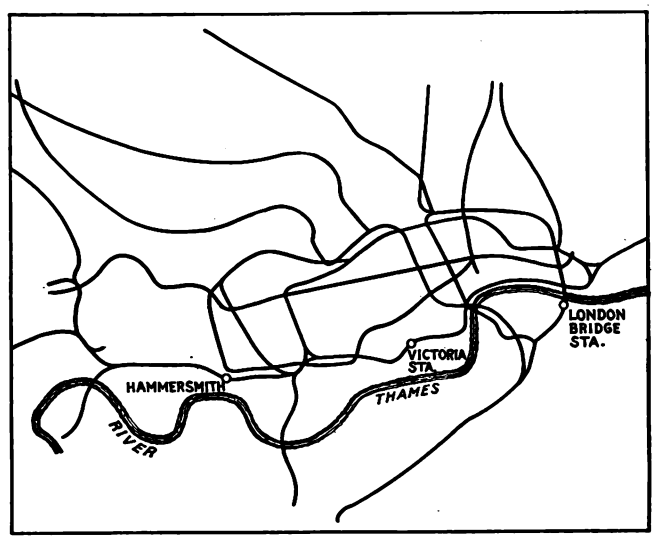
The act authorized the appointment of an advisory committee to report to the Minister of Transport on possible transportation improvements in the London Traffic Area. The ordinary membership is made up of eight representatives from the various boroughs and other districts served, two from the police and one each appointed by the Secretary of State and the Minister of Transport. Besides these regular members there are seven others, four representatives from the owners of the transportation lines and three from among their employees, to serve when matters of transportation were considered.

In its early inquiries into transport facilities in London, made some time ago, the committee found that additional means of transport, particularly underground railways, were greatly needed, especially in the north, northeast, east and southeast of London; that the present competitive methods were wasteful, uneconomic and unnecessary, and that all forms of public passenger transport under unified management, subject to public control, appeared to offer the only satisfactory and lasting solution to the problem of passenger transport in London. There still remained, however, the way of bringing about such a result. This is outlined in a report of the committee made public on Oct. 25, 1927. Its proposal, the committee explains, is by no means final. It is put forward as a basis of negotiation with all the authorities concerned, and after they agree it must then be approved by Parliament. In its opinion, if its proposal is accepted, the transportation undertakings concerned can be made self-supporting without any increase in the general level of fares now prevailing.

The basis of the proposal is the establishment of a so-called common fund and a common management for the various undertakings. The common fund is essentially a London plan, which has worked well for a number of years with the omnibus and tube railways in that city. It has brought to them most of the advantages of consolidation without a great many of its disadvantages. Under the common fund plan the bus and underground railway companies in the "Underground Group" pay their own operating expenses, interest and certain returns on their stocks, but then pool the remainder of their income into a fund, which is distributed between the constituent companies according to a definite plan. The result is that those lines which are most profitable help carry those which are not.

It is this principle of the common fund, not consolidation, that the committee recommends for the future in London. The ownership of the existing undertakings would remain with the present owners, whether they are municipalities or private companies, though possible exceptions to this principle or some variation of it may be necessary for the small bus operators because of the small interests which they severally represent.

While recommending the common fund system broadly, the committee recognizes that where a system in the past has been unable to meet its fixed charges, the extent to which those charges should rank in the revenue liabilities would have to be the subject of negotiation. Special treatment would also have to be given to the municipal properties, as the investment in them is represented by municipal loans rather than the usual form of capital issues.



Map of London's underground railways, with suburban connections

In connection with the constitution of the common fund, the committee also points out that as some margin of current revenue must be secured to establish a credit for raising additional capital for extension and development, it may be necessary to have legal authority to extend the period for the repayment of loans raised by the municipality, and that no party to the agreement should increase its revenue liability except under proper authority or increase its depreciation reserve or under-

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Bus routes within the London district operated by the London General Omnibus Company

take any other agreement which would prejudice the constitution of the common fund except with the consent of the others or, in case of dispute, of arbitration. Provision should also be made for temporary financing as well as for some convenient uniform basis for calculating the reserve for depreciation and renewals of the several properties.

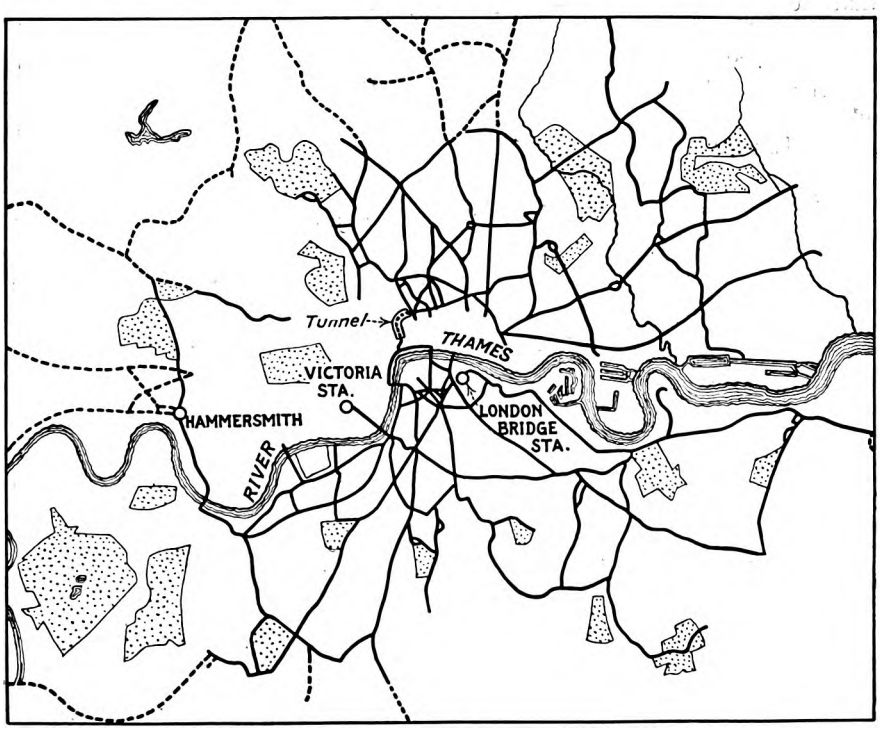
The committee points out that the various parties to the plan are of different degrees of financial strength and security. It would therefore be unfair to distribute the common fund, at any rate at first, in direct ratio to the capital of the different undertakings. A better plan, in its opinion, would be to select some past year as a "standard year," and distribute the common fund pro rata to the contributions which the different undertakings would have made to the fund in that year, though this rate of division might be modified later as the capital of the individual major divisions is built up. The balance remaining, after the payment of a reasonable return on the capital employed, should be used for any one of the following purposes: (a) To provide credit to attract new capital; (b) to carry out improvements to the existing undertakings; (c) to reduce fares and other charges; (d) to provide a general reserve against possible future bad years; (e) to finance temporarily new capital expenditures; (f) such other purposes that may be approved by the Minister of Transport.

The report points out that not only will a number of economies result from a common management as well as a common fund, but that a common fund really postulates a common management. Such a management, besides operating the property, would see that all of the undertakings are maintained in efficient order, and that adequate traveling facilities are provided for the public and that the combined undertakings are managed so that the earnings will be sufficient to meet all proper charges and to provide a reasonable return on the capital. The question of fares would also be negotiated by the management with the authorities.

While public control is necessary and assumed for the plan proposed, the report declares it should be simple and under one head, say under that of the Minister of Transport, rather than through various local authorities. Such a single authority also is in a better position to determine what additional traveling facilities are needed from time to time and should have authority to refuse permission for those that would conflict with the general plan.

The report also points out the need for a fair degree of permanency for any plan adopted and suggests a minimum period of 42 years. Otherwise, the report says, it will be difficult to raise the necessary capital to expand the system.

The report is signed by Sir Henry P. Maybury, chairman of the committee, and by fifteen of the other eighteen members. The three remaining members add individual comments. One of the three considers the plan "unsuitable, impracticable, and unfair" to the independent bus companies, and one who represented the main line railways and Metropolitan Railway did not sign because he wished to leave them free to dissent from the report if they wished. The third was prevented by illness from attending the meetings, but expressed himself as in general agreement with the plan.



The solid lines show the routes of the London County Council Tramways. The dotted lines in the suburbs show through connecting routes

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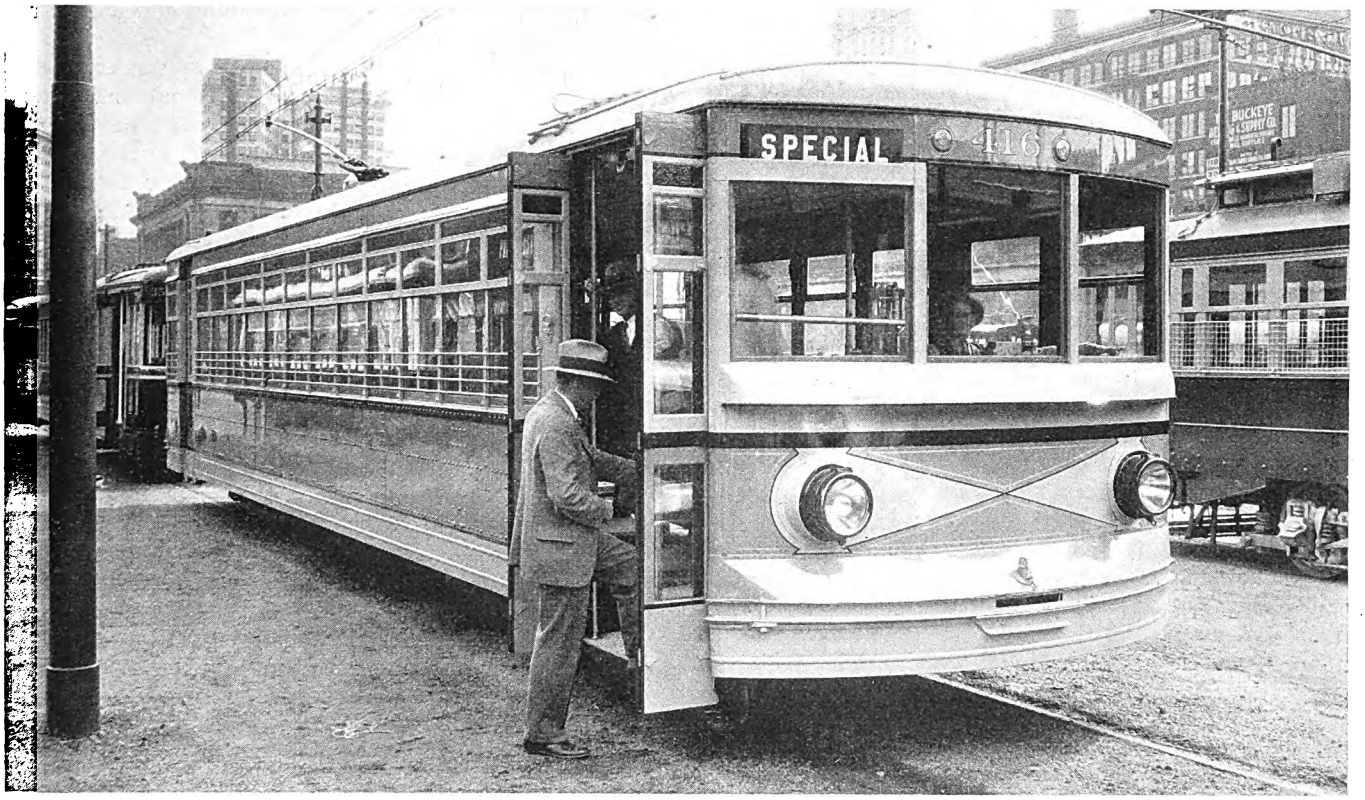
Houston Electric Company

Makes Good Its Promise

Delivery of twenty new cars including many features designed to make them attractive and comfortable represents fulfillment by company of agreement made at time fare was increased



Three-quarter view of the new Houston car taken at the Cleveland convention, where it attracted much attention from railway men interested in improving the appearance of electric railway equipment. The method of carrying out the streamline painting and the use of double headlights are clearly shown. The colors are: blue below the belt rail, a red stripe along the rail and around the dash, with cream between the letterboard and the belt rail.

RECEIPT by the Houston Electric Company of the twenty de luxe single-end city cars recently built for this rapidly growing Texas seaport by the St. Louis Car Company marks the fulfillment of promises made to the Houston public a short time ago by the railway management. In fact, when the new cars were recently paraded before the eyes of an admiring citizenry the average man on the street had direct visual evidence that the local railway had not only lived up promptly to its agreement to make heavy investments in new equipment, but had succeeded in developing for Houston a public transportation vehicle in keeping with the energetic and progressive spirit of the city.

Thus the constantly growing co-operation between the public and its transportation company is beginning to show the full measure of its possibilities both for the development of the city and the improvement of local transportation service. Recent fare readjustments authorized by public officials, as recorded in the June 18, 1927, issue of ELECTRIC RAILWAY JOURNAL, were dictated not by an ill-advised, parsimonious, rabble-tickling attitude of splitting pennies, but on the business-like basis of permitting the company to charge a reasonable rate, provided the city could be assured of first-class, up-to-date transportation service that would represent full value for the fare charged. These conditions the company was entirely willing to accept. The cars just delivered, a sample of which was on exhibition during the recent convention in Cleveland, represent a sincere effort by the company to "go the limit" in providing for Houston the finest type of street car which it was possible to obtain.

The resulting cars represent the combined efforts of the Houston management, which is under Stone & Webster, Inc., executive direction; C. O. Birney, superintendent of car construction Stone & Webster, and the St. Louis Car Company to develop a car to fit 1928

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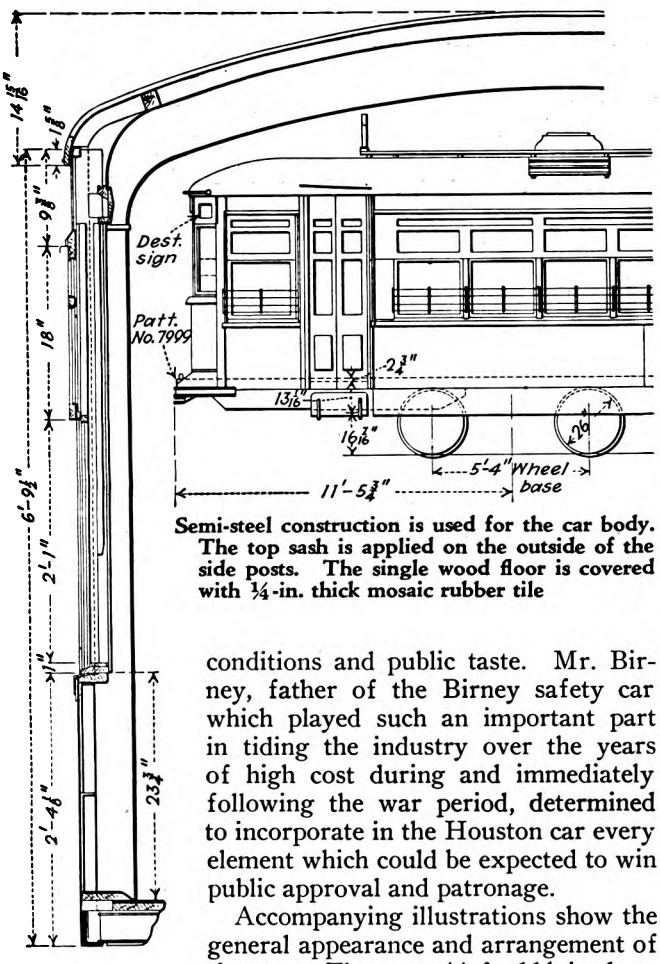


Semi-steel construction is used for the car body. The top sash is applied on the outside of the side posts. The single wood floor is covered with ¼-in. thick mosaic rubber tile

conditions and public taste. Mr. Birney, father of the Birney safety car which played such an important part in tiding the industry over the years of high cost during and immediately following the war period, determined to incorporate in the Houston car every element which could be expected to win public approval and patronage.

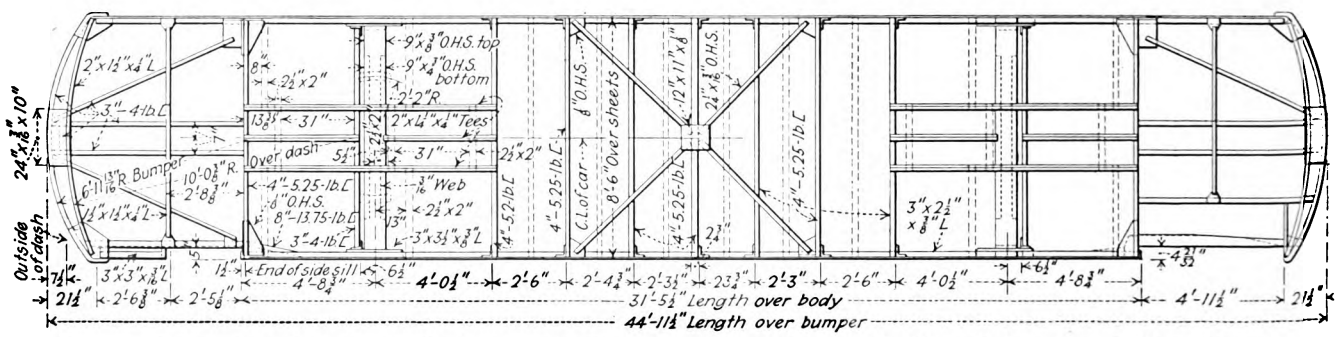
Accompanying illustrations show the general appearance and arrangement of the cars. They are 44 ft. 11½ in. long over all, 8 ft. 8½ in. extreme width, and 10 ft. high from rail to trolley base. The design is for one-man, single-end operation and seats 57 passengers. A treadle at the rear end automatically controls the exit door at that point. The cars weigh complete 36,000 lb. with four Westinghouse 510-A motors and St. Louis EIB-64 trucks. This weight is divided 18,400 lb. for the car body, 9,000 lb. for trucks and 8,600 lb. for equipment.

In determining the general lines and proportions of the body, every effort was made to give these cars a graceful, streamline appearance in keeping with the influence of the automotive vehicle on public taste. This effect is accented in the painting scheme through the use of horizontal bands of color running in unbroken lines around the entire car and across both the front and rear doors. A skirt around the bottom of the car helps to carry out this scheme by eliminating breaks in body lines which usually occur at doors, steps and bumpers. A comparatively flat arch roof helps in obtaining the effect desired. Double headlights at the front end show the automotive influence and insure greater safety at night.

Cross seats are used throughout; even the customary short longitudinal seats near the ends of the body are eliminated. Due to the fact that the car is designed for single-end operation, comfortably upholstered seats could be built around the rear vestibule, thus giving a total seating capacity of 57 in a car that is less than 45 ft. long over all. This is accomplished with no sacrifice in comfort, however, for the side post spacing is 30 in. to give wide windows and ample seating room. The seats themselves are of the twin type and are stationary. They are heavily upholstered in Hyaline, aniline dyed and hand buffed. Convenient handholds, mounted on the outside curve of each seat back, provide comfortable supports for standing passengers without detracting from the interior appearance.

One-quarter-inch thick mosaic rubber tile covers the car floor. Haskelite headlining is used not only in the body proper but in the vestibules as well, thus carrying out a finished appearance in the interior to the extreme ends of each vestibule. Center bowl type Safety Car Heating & Lighting Company fixtures provide diffused interior illumination. At the rear vestibule windows heavy draped curtains of blue material lend an air of comfort and luxury to both the interior and exterior appearance of the car. The interior finish is mahogany with nickel-plated fittings. The controller tops, handles and valves at the front end of the car are all nickel-plated to improve the interior appearance.

To facilitate inspection of apparatus under the car, the skirts along the side of the body are hinged in sections to the side sill, so that they may be easily raised. The body top sash, which is applied in a continuous frame on the outside of the side posts, is glazed with individual window sections of clear glass below a narrow rail set down about one-fourth of the distance from the top to the bottom rail, and extending across two window sections, cutting off each alternate upper sash stile to form a long narrow glass opening across each pair of side windows. The lines of this extra upper sash framing are carried across the doors with narrow rails, so as to form continuous glass lines from one end of the car to the other. These top openings are glazed with red glass which is intended to accentuate the streamline appearance of the body. Although the vestibule belt rails are not in line with the belt rail of the body, but are set higher, the side glass lines are carried across the doors, and a broad stripe of paint along the body belt rail is carried across the doors and around the dash. This again gives a streamline effect, and tends to offset the break in structural lines between the body and the end of the vestibule. Around the vestibule belt rail at



The underframe of the Houston car is of conventional design using steel angle side sills and channel cross-sills and bumpers. The underframe at the front end is arranged for inside entrance steps

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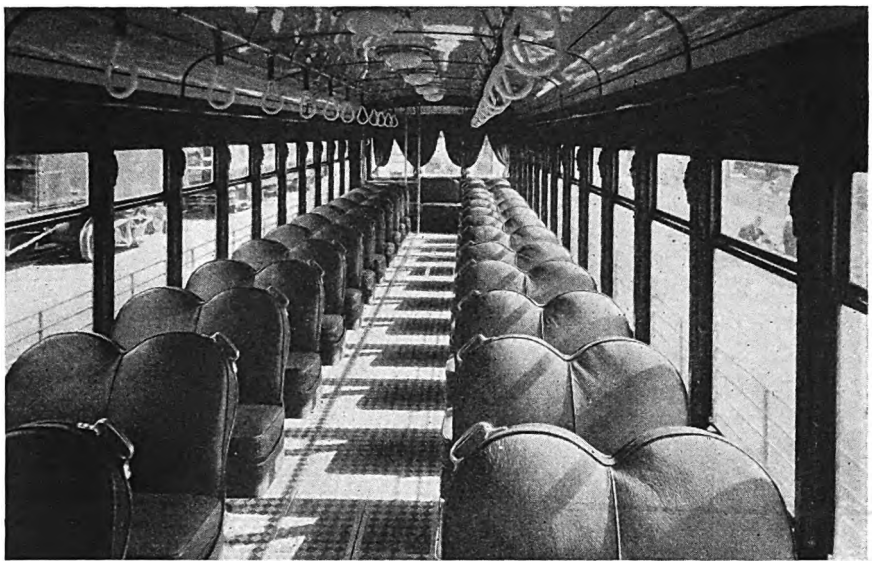
each end of the car there is built a curved metal hood, inclosing a circuit of concealed incandescent lamps which illuminate the dash at night.

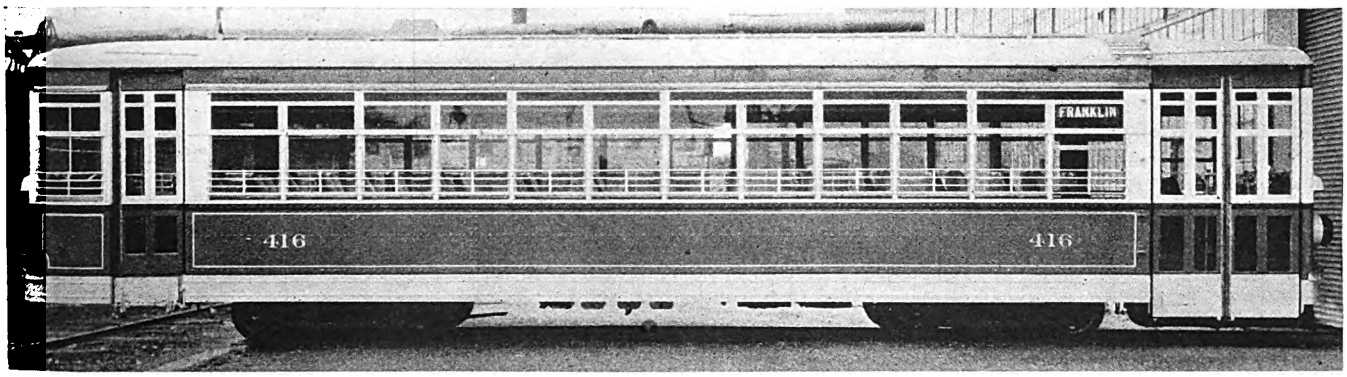
Returning now to the structure and framing of the car, the design follows conventional modern semi-steel construction practice, using wood-covered steel "T" side posts of the type first introduced widely with the Birney safety car. An accompanying cross-section drawing shows the principal body dimensions and the arrangement of posts, sash and roof framing construction. The underframe design is also shown in an accompanying drawing. The body side sills are 3-in. x 2½-in. x ⅜-in. angles. The principal cross-sills are 4-in. 5¼-lb. channels, including the end sills. Bumpers are 3-in. 4-lb. channels with the flanges turned out.



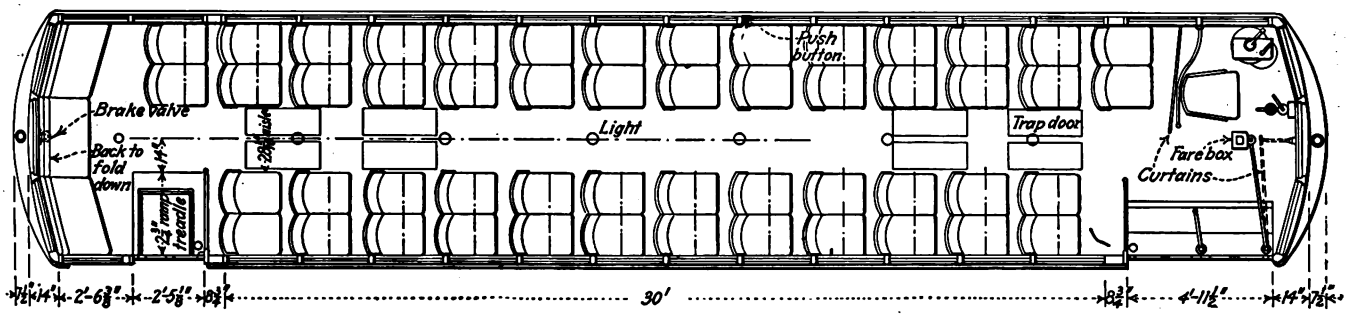
Twin, leather-upholstered seats, a wide aisle, center bowl illumination and draped blue curtains at the rear end present an inviting interior to passengers, as an inducement to leave their automobiles at home

The body floor is 32¼ in. above the rail, with the car mounted on 26-in. rolled-steel wheels. No ramp is used in the floor. At the front end the steps are of the inside type, inclosed by double folding doors. At this point there are three steps from the rail to the body floor. This brings the bottom step very low, to facilitate easy entrance. From rail to body floor the front steps are 12⅜ in., 9 15/16 in., and 9 15/16 in. respectively. The over-all front door opening between body and vestibule corner post is 4 ft. 11½ in. These front doors are controlled by the car operator from the Safety Car Devices brake equipment.

At the rear end there is a single folding exit door automatically controlled by a National Pneumatic Company treadle. Here a single folding step is used, making the heights from car floor to rail 13 1/16 in. and 16 7/16 in. respectively. Following the practice now generally used for automatic treadle exit door applications on one-man cars, the rear door may be controlled directly by the car operator after the brakes are set, or may be opened from the exterior of the car with a key applied to the street fare collector's valve, which is part of the equipment. Since this car is destined for operation in a Southern city, the automatic exit door provides the solution for the vexing race problem on one-man operated cars. Both white and colored passengers enter at the front end. Whites seat themselves from the front end toward the rear, while blacks seat from the rear toward



This full side view shows how streamlines have been carried continuously across the doors and gives a good impression of the effect produced by the skirt around the bottom of the body. A strip of narrow red glass is installed in double window sections in the upper part of the upper sash, and is also carried across both front and rear doors



The Houston car is arranged for single-end operation, and is fitted entirely with cross-seats. All seats, including those around the rear end, are luxuriously upholstered in hand-buffed leather in the effort to provide comfort and attractiveness to passengers

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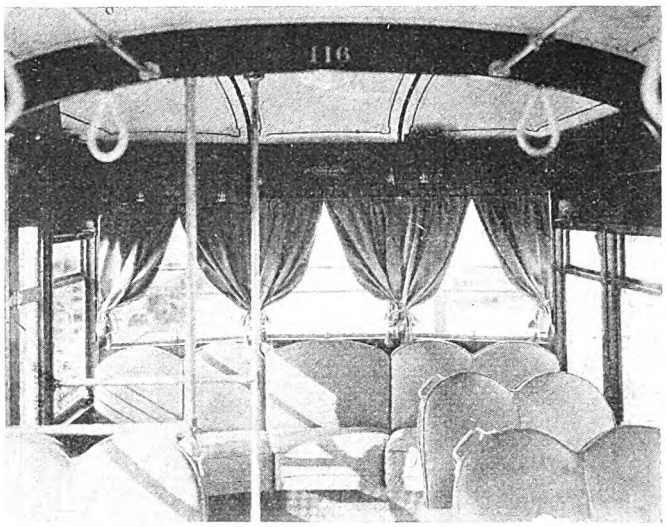
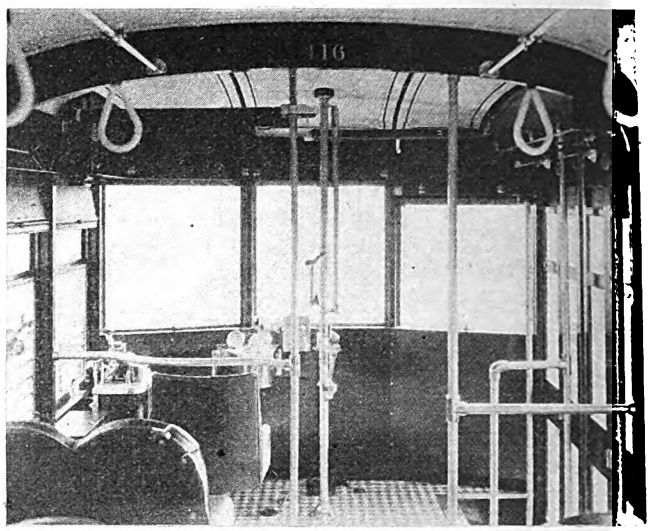


Comfortable leather-upholstered seats are carried around the rear end of the body, back of the automatic rear exit door



Note the clean appearance produced in the front vestibule by the use of copper tubing for air piping

the front. Colored passengers then leave through the automatic rear exit, while whites leave from the front end of the car. Both in Houston and in many other Southern cities where it has been tried this arrangement is said to have proved entirely satisfactory with the public as a solution of the problem of one-man car operation in combination with race separation.

One of the most interesting and novel features of the equipment on these cars is the method of installing brake and pneumatic control apparatus. Copper tubing is used in place of iron pipe for air lines. This makes possible a number of changes from conventional practice which promise to eliminate many elements of cost, maintenance, time loss and service interruptions that are now experienced. The use of copper tubing simplifies the problem of pneumatic apparatus installation and substantially reduces pipe friction. Since the tubing may be readily bent to fit around points which presented extreme difficulties with former iron pipe and fittings, it can be installed much faster and makes possible a neater piping job. The results that may be accomplished in this direction are clearly shown in the accompanying illustration of the front vestibule of the Houston car, where no piping is visible and where the brake valve is inclosed in a neat housing set up on the dash and entirely free of piping below.

Extreme simplicity of piping installation and reduction of bends and pockets to a minimum are obtained. From the brake valve the copper tubing is carried down back of the vestibule dash, and then with a single bend is carried back along the car floor to the opposite end of the body. It is claimed that by using copper tubing the troubles from scale in iron pipe are entirely eliminated.

All pneumatic apparatus and valves are grouped in a single box mounted under the car floor. This box is approximately 11 in. x 11 in. x 44 in., interior dimensions, and is fastened securely to the car floor by four bolts, one at each corner. In it are contained the various valves of the brake and safety control devices. Two sides of the box are removable for ready access to the inclosed apparatus.

Electrical wiring is contained in flexible conduit, inclosed in a transite-lined wood wiring box. A back-up device consisting of a Westinghouse TC-2 switch and a PV-3 brake valve is provided at the rear end of the car. Variable load brakes, Westinghouse DH-16 compressor, Oskelite stop signal, Economy power meters, Johnson air-operated fare boxes, aluminum stanchions and Hunter destination signs are used on the cars. Other miscellaneous equipment includes National Lock Washer type C curtain fixtures, double-faced Pantasote curtain material, Golden Glow headlights, full Safety Car Devices equipment, Curtain Supply brass sash and fixtures, Feralun and Kass safety treads, Keystone trolley catcher, Ohio Brass trolley base and wheels.

Electric Railway Pension Plans

Some practical suggestions for setting up a sound retirement plan for the employees of a railway company

By E. C. McDonald
Supervisor Metropolitan Life Insurance Company

Mr. McDonald here presents some pithy suggestions on two of the main problems connected with a sound pension plan. He makes no effort to sell this form of better relations with employees, but rather presents a sound solution of the problem.

During the last year or two American business has been giving increasing consideration to old age pension plans. Many officials of street railway organizations are confronted frequently with the problem of pensioning their old and faithful employees. They see the pension cost curve rising every year with disturbing regularity, and naturally thoughtful executives wonder where it will end. The necessity for a retirement plan soundly set up with due regard to the liabilities involved has been set forth recently in articles and booklets such as the following: "Industrial Pension Plans," *Annalist;* "Safeguarding Employees' Pensions," New York *Times;* two articles on pensions, *Saturday Evening Post;* two articles on pensions, *Railway Age;* "A Study of Employee Pension Plans" published by the National Metal Trades Association, and "Industrial Pension Plans in U. S." issued by the National Industrial Conference Board.

The increased interest in the whole subject has resulted in the revision of many retirement plans to conform to modern pension practice not only in industry but among

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educational institutions and religious bodies. Frequently in considering the subject of pensions some confusion arises because two totally separate problems are combined into one: First, the problem of correct accounting for pension costs, and second, the problem of providing the money to pay pensions.

Basis of Plan

Let us assume that the "Smithville Electric Railway Company" has determined to allow pensions beginning at age 65 in an amount equal to 1 per cent of average salary over the whole period of employment multiplied by years of service. The amount of the pension, of course, may be any predetermined sum, but it should be based either on a fixed amount, as for example $50 per month, or a fixed sum for each year of service, as say $1 per month for each year of service; or a fixed proportion, as say 1 per cent of the average yearly salary. The pension may be based on a proportion of the final five or ten years' salary, but this basis involves unknown quantities because a prediction as to an individual's salary twenty or thirty years hence or what the general wage level will be then is necessarily guessing and does not permit accurate mathematical treatment.

Quite aside from matters of finance, it would seem that as the pension, once determined, is a contingent liability, arising out of continuous service, and usually proportioned to the length of service, this liability should form a proper charge against the current operating cost of the year during which the service was rendered. Therefore, assuming the pension previously outlined of 1 per cent of average salary, if an employee during the year 1927 renders service for which he is paid $2,000 there should be set up against operating expense a charge equal to the present value of an annuity—for every pension is an annuity—of 1 per cent of $2,000, or $20, payable for life from age 65. Now, the value of a life annuity of $20 a year at age 65 is, roughly, $200, and assuming the employee to be 25 years old in 1927 the appropriate charge today would be the present value of $200 forty years hence, which is $41.66. There is no reason that this could not be further discounted by the expectation of the deaths occurring between ages 25 and 65, in which case the railway company should charge against operating cost $26.46.

A succession of such entries during the working life of this employee would build up a credit to offset the annual charges against operating cost, and the obvious place for this credit is an account which might be called "Pension Reserve." It has been assumed in the calculations that the pension reserve account would also be credited each year by interest at 4 per cent as a further charge against operation, and in the event that the smaller of the two figures noted above had been adopted as a basis and death had been taken into account in the original charge, then if an employee should die the amount that had been credited to the pension reserve account would remain as a credit, whereas if the larger of the two amounts had been taken as a basis of original charge then in the event of the death of an employee the amount which had been put up in the account during his previous working life would be withdrawn as an offset to other amounts charged during the year of his death.

When an employee leaves the service prior to pension age, there results a charge against the pension reserve and a credit to operating cost of the amount which had previously been set up for his benefits with its interim accretions.

Looked at as a group, the pension reserve account each year shows the following entries:

1. The total of all the charges to operating account on a reserve for the pensions of employees actively at work during the year.
2. A credit resulting from the charge to operating account of 4 per cent interest on the total credit balance of the reserve account.
3. A charge represented by a credit to operating account for the total reserve heretofore provided for employees leaving the service during the present year.
4. A charge represented by a credit to cash for all amounts paid out as pensions to retired employees for whom reserves had been set up in the past.

In view of the permanence of such an industry as a railroad or a public utility, there seems to be no logical necessity of a segregation of actual money in a fund for the eventual liquidation of drawbacks, not the least of which is the effect on political bodies of the appearance of a huge sum of money which has apparently been taken from customers. The presence of such a fund is also likely to lead and has, in the past, led to undue generosity on the part of boards of directors, or to a reduction of the annual payments into the fund. If, on the other hand, the operating charges be duly made and the fund appears on the "liabilities" side of a corporate balance sheet, there is small likelihood of criticism on the part of regulating bodies, and the directorate is apt to be more careful of adding to this liability than it might be otherwise. Obviously, in dealing with a business of more transitory nature, such as an ordinary industrial company, the fund may be looked upon as an added safeguard to employees.

Plan When Employee Contributions Are Accepted

If employees' contributions are accepted, they could probably be most wisely dealt with by segregation and maintenance either in the hands of an insurance company or a savings bank. It is unlikely that any commercial enterprise is properly equipped to handle most efficiently the weekly deposits of employees. Unless the machinery be extremely well organized, it is costly and liable to cause misunderstandings. In this regard probably the life insurance company is most able to deal with the whole matter to advantage.

For some years it has been the custom of the president of one of our most important railroad systems to give to the public each year in newspaper advertisements and pamphlet form an analysis of each cent of disbursement which the railroad makes out of every hundred dollars of income. Among the items in this analysis we find $5.34 for depreciation of plant and equipment. This item is substantially a constant. In other words, the proportion for depreciation out of every 100 cents of income would probably not vary a great deal from year to year and be approximately 5½ per cent of total disbursements. It was further noted in this analysis that out of every $100 of disbursement 30 cents went for pensions to retired employees. This item for pensions as a proportion of income has been and will be in the future constantly on the increase, so that its per cent relation will vary a great deal, for example from 1927 to 1957. On the one hand, we have an item for depreciation set up every year according to sound accounting methods. On the other hand, we have an item for pensions which does not reflect accurately the depreciation on the human factor. Stockholders subscribe to account-

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ing methods which provide for adequate depreciation annually, and yet these same stockholders are not being properly charged for their proportionate share of the depreciation on the services of the employees who produce their dividends.

In other words, in the case of this railroad it is conceivable that the stockholders of, say, 1957 will be charged for pension payments out of all proportion to the depreciation of plant and equipment, and this item might possibly have serious results in determining the dividends of the railroads. The stockholders of 1957 should not be charged for pensions which arise out of service rendered by employees who are making profits for the stockholders of 1927, and yet that is exactly what is being done. It is an odd accounting method which demands that stockholders of 1927 be charged their proper share of the depreciation of plant and equipment and yet shifts on to a future generation of stockholders the burden of providing pension payments arising out of service rendered in 1927.

Fortunately business management is giving increased recognition to the application of sound accounting methods to the human factor as well as to materials, rolling stock, and manufacturing equipment, and eventually, no doubt, the item of sinking fund or reserve payment on account of pensions will be a familiar item to stockholders who examine carefully the annual financial statements of their corporations. Executives of street railways and electric roads will do well to investigate carefully this question of pensions for their employees, and according to the suggestions made in this article if the bookkeeping entries are followed there should be no trouble in preparing a retirement plan on a sound basis. Of course, it is well to call in an adviser who makes a specialty of dealing with situations of this kind, but the whole matter is important and yet simple enough to warrant investigation.

The Readers' Forum

A Substitute for Wood Ties?

PUBLIC SERVICE PRODUCTION COMPANY
NEWARK, N. J., Nov. 2, 1927.

To the Editor:

In the Sept. 1, 1927, issue of the *Iron Age* there appears an article by M.H.C. in which he urges a broad study of steel ties. It is a plea to the engineering organizations of the steel manufacturers to secure for steel "the business that belongs to steel," at the same time inferring that the reason why more steel ties are not being used is because of the fact that competitors of steel, by virtue of greater foresight and business management, have developed a "nearly satisfactory substitute." The author apparently has taken the arbitrary attitude that steps should be taken by the steel industry to force the substitution of steel for wood ties.

If the author is sincere in his statement regarding securing for steel the business that belongs to steel, it is quite likely that railway engineers generally will agree with him, but he certainly must be aware of the efforts during the past 20 or 30 years on the part of the steel industry, and railroad engineers as well, to develop a satisfactory substitute for wood ties. This has not been confined to steel alone but to combinations of steel and concrete, concrete and wood and steel and wood as well, and some of the best brains in the two industries have been working on this problem. M.H.C.'s viewpoint is somewhat warped if he thinks that it is a question of developing a "nearly satisfactory substitute for the steel tie." It has rather been a case of trying to develop a more nearly satisfactory substitute for the wood tie.

The tie committee of the A.E.R.E.A. has studied this question carefully for many years, and the steam railroads have made many experimental installations of different types of substitute ties, the reports on the results of these installations being available to any one who may care to study them. Certainly the electric railway industry has experimented with steel and other forms of substitute ties on a fairly large scale and in many instances the results obtained have been not only unsatisfactory but disastrous financially as well.

The question of steel or other substitutes for the wood tie, and in the use of the term wood tie we of course mean treated timber because no company can afford to use untreated timber for ties, is purely one of economics. Does M.H.C. mean to imply that railway engineers are not alive to the importance and necessity for timber conservation? That this is not so is borne out by the fact that the annual consumption of wood ties for renewals is now approximately 100,000,000, whereas if no treated timber were used for this purpose the requirements would be more than 50 per cent greater than this figure. With about 400,000,000 untreated ties still in service and with treated ties being installed at the rate of about 65,000,000 per year, it will not be very many years before the wood tie situation will be even more favorable than at present. The need for a substitute is rapidly disappearing.

In discussing the above article in the October issue of *Wood Preserving News,* Grant B. Shipley stated the question fairly when he said: "Those who make deductions of cost trends from an examination of raw material values only may be led to a conclusion that railroads, which now pay as much as $1.40 for a wooden tie (which at one time could be bought for 75 cents), must obtain a substitute for such high-priced wood. The fact of the matter is that the 75-cent tie, which had to be replaced several times during the life of a treated tie, cost more per year of service than the $1.40 tie, to which the expense of preservative treatment is added. In spite of increasing raw material costs, the annual cost of wooden ties in service is decreasing through better protection of wood from decay and mechanical wear."

The success which has been met in the preservative treatment of timber has not only increased the life of the previously acceptable timber for ties but has also greatly increased the field of timber available for this purpose, so that if wood preservation is generally adopted, we are now assured of a dependable and economical supply of wood. While M.H.C.'s argument to increase the steel output 2,500,000 tons per year is commendable from the steel manufacturer's point of view, it shows lack of knowledge of all the facts regarding the situation that actually exist, and it will have to be presented in a more convincing way before the steel industry would be justified in making any increase in its present investment in steel-tie-producing machinery. The questions raised by M.H.C. have been answered to the entire satisfaction of the majority of the railway engineers of the country, and the 100 per cent satisfactory substitute for the wood tie has yet to be produced, although the U. S. Patent Office records contain many designs intended to accomplish this result.

HOWARD H. GEORGE.
Chairman Committee on Way and Structures A.E.R.E.A.

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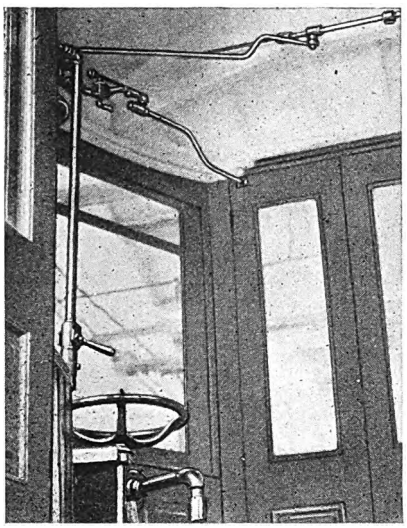
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—16

Sleeve Arrangement Solves Door-Opening Problem

CONTROL of the rear door on one-man cars of the Connecticut Company in cases where there is insufficient room to install door engines has been made possible by a sleeve and rod arrangement operating independently. The sleeve controls the front door, while the inside rod controls the rear door. At its top the sleeve is connected to the door by the usual bell crank and lever. Within this sleeve is a rod connected by a similar bell crank and lever to a long horizontal rod that is in turn connected to the rear door. The inside rod is operated by the same handle as the sleeve controlling the front door. After the car has stopped and the front door has been opened, this handle is lifted off by the motorman and placed in a lower position on the rod to open the rear door. This device has proved extremely useful at heavy loading and unloading points and the convenient arrangement for operating saves time.



Sleeve and rod construction

On one-man cars of the Connecticut Company where there is insufficient room to install door engines, the front door is operated by a sleeve and lever arrangement, while the rear door is operated by a rod inside the sleeve.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—11

Permissible Variations and Clearances for Armature Bearings

IT IS advisable to fit armature bearings with the minimum permissible clearance to the shaft to reduce vibration and pounding. Babbitt lined bearings with ample oil grooves should have initial clearances before they are pressed into housings with the proper tonnage as follows:

Nominal Bore	Plus Allowance Inches for Bore Before Pressing Into Housing
2 to 3 in.	0.006 to 0.008
3 to 4 in.	0.008 to 0.010
4 to 5 in.	0.012 to 0.014
5 to 6 in.	0.016 to 0.018
6 to 7 in.	0.018 to 0.020

Permissible Variation on Armature Shaft at Motor Bearing Seat—With nominal diameters up to 7 in., the permissible variations of armature shafts at the bearing seat should not exceed + 0.0 in. to — 0.002 in.

Press Fits of Bearings in Housings—The following permissible variations should be observed to secure a press fit of approximately 3 to 7 tons:

1. The nominal bore of the bearing seat in the housing should not vary more than 0.001 in.

2. The permissible variations for the nominal outside diameter of the bearing is + 0.002 to + 0.004 in.

3. A bearing should not be returned to service if the pressure required to press it into the housing is less than 1 ton.

Allowable Wear Between Shaft and Bearing Bore—The maximum total radial wear in service for armature bearings of motors less than 50 hp. should not exceed $\frac{3}{32}$ in. total between the shaft and the bearing bore. For motors larger than 50 hp. $\frac{1}{16}$ in. may be allowed.

Armature shafts which are worn $\frac{3}{64}$ in. at the bearing seat should be remachined to the nearest standard undersize.

Armature End Play—Overhauled motors should not be returned to service with less than $\frac{3}{32}$ in. or more than $\frac{5}{32}$ in. total armature end play.

The maximum total armature end play in service for motors less than 50 hp. should not exceed $\frac{1}{8}$ in. For motors larger than 50 hp. $\frac{1}{4}$ in. may be allowed.

The armature end play should be taken up by the use of $\frac{1}{16}$-in. washers between the bearing flange and the housing. Where this wear is more on one end than the other, proper adjustment should be made.

Armature bearings should be pressed into housings with a hydraulic press. A sledge should never be used.

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Electric Railway Journal Maintenance Data Sheet

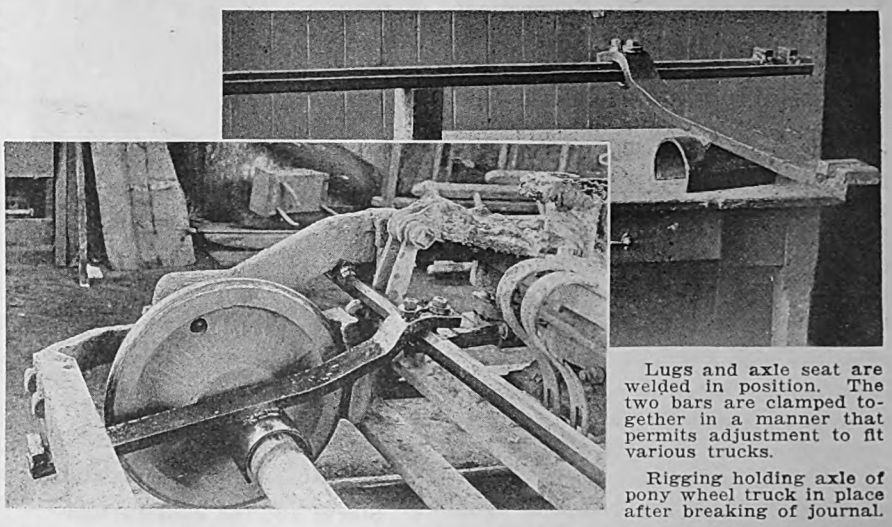
ROLLING STOCK—MISCELLANEOUS—17

Bringing in Cars with Broken Pony Journals

By A. F. Rexroth
Master Mechanic Harrisburg Railways,
Harrisburg, Pa.

DIFFICULTY experienced by the Harrisburg Railways, Harrisburg, Pa., in bringing in cars with broken pony journals has resulted in the development of a rigging which holds the axle firmly in place during the trip back to the shop.

The improvements made in the rigging now used consist of a cross bar extending from beneath one side member of the truck frame to the similar member on the opposite side and of a longitudinal bar between this cross bar and the end of the truck frame. To the underside of the longitudinal bar is welded a curved bearing which fits the axle. The cross bar is of high carbon steel of octagon section and 1¾-in. diameter. The flat bar used for bearing support is 1-in. x 4-in. steel. Cross and longitudinal bars are clamped together in such a way that adjustment can be made to fit the various types of pony wheel trucks. This rigging is put in place after lifting one corner of the truck frame with an ordinary jack. The process of installation usually takes about ten minutes.



Lugs and axle seat are welded in position. The two bars are clamped together in a manner that permits adjustment to fit various trucks.

Rigging holding axle of pony wheel truck in place after breaking of journal.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—12

Permissible Variation and Clearances for Axle Bearings

USUAL practice is to mount axle bearings with a greater initial clearance than is allowable for armature bearings, as axle bearings as a rule are not lined with babbitt and are not fitted with oil grooves. It is desirable, however, to make the initial clearance as small as possible in order to reduce the spreading of gear centers and to minimize vibration and noise. Allowable initial clearances of from 0.015 in. to 0.017 in. have given good results in service.

Tolerances on Axle at Motor Bearing — The tolerances recommended for all sizes of railway motor axles at the motor bearing seat are + 0.002 in. to — 0.002 in.

Clamp Fits of Bearings in Motor Frame—To secure a correct clamping fit, the bearing seat in the motor frame and the axle cap should be machined with a 0.0172-in. liner at the split.

Bearings should not be returned to service if the axle caps will not clamp the bearing tightly.

The permissible variation of the nominal outside diameter of the bearing is + 0 in. to + 0.003 in.

Allowable Wear Between Axle and Bearing Bore—The maximum total wear for the axle and bearing bore in service should not exceed $\frac{1}{16}$ in. for motors up to 50 hp. For motors larger than 50 hp. $\frac{1}{8}$ in. may be allowed.

Axles which are worn at the bearing seat $\frac{3}{32}$ in. or more on the diameter should be remachined to nearest standard size.

Motor End Play — Overhauled equipment should not be returned to service if the motor has less than $\frac{1}{32}$ or more than $\frac{1}{8}$ in. end play on the axle.

Axle bearings should not be returned to service where the flange wear is $\frac{1}{8}$ in. or more.

The maximum total motor end play for motors up to 50 hp. in size should not exceed $\frac{1}{4}$ in. For motors larger than 50 hp. $\frac{3}{8}$ in. may be allowed. Adjustable axle collars may be used to correct excessive end play.

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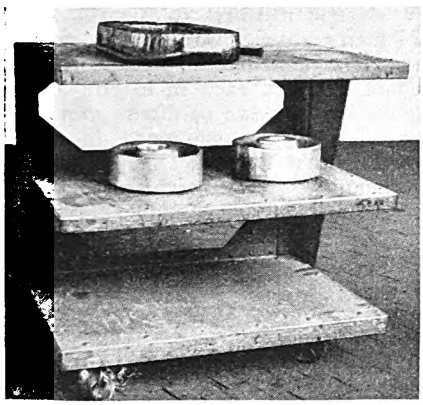
Truck with Shelves for Moving Material About Shop

By Jesse M. Zimmerman
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

INSUFFICIENT care is given in the handling of parts such as field coils, bearings, and so forth, as they are moved from the storeroom to the shop for assembling. They are usually carried into the shop and laid on the floor as close as possible to the place where they are to be used. Many times they are in the way during previous operations before it comes time to use them. They must either be moved or subjected to unnecessary bumps and abuse.

The accompanying illustration shows a convenient type of truck with shelves which will be found particularly suitable for moving small repair parts about the shop and to the job. The truck illustrated was



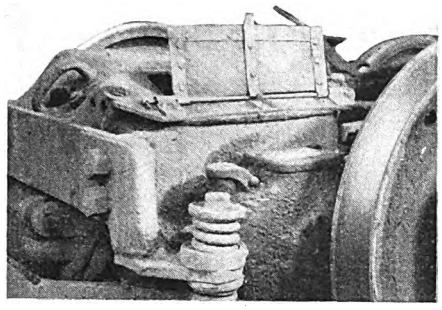
Convenient type of ball-bearing truck for moving small repair parts about shop

designed by the equipment and method department at the Homewood Renewal Parts Works of the Westinghouse Electric & Manufacturing Company. It is equipped with ball-bearing castors, which turn in a ball-bearing pivot.

The material to be used in any assembling operation can be placed on one of these trucks and moved about the job or shop with ease, placing it in the most convenient place for the workman and thereby saving both time and material.

Self-Closing Commutator Cover

MOTORS in operation on the lines of the New York & Queens County Railway, New York City, originally were equipped with malleable iron commutator covers held in position by cam levers. When the shop men neglected to fasten the



Losing of motor covers overcome by self-closing feature

covers properly after inspection or repair work they would drop off in service and were lost or destroyed. This necessitated a continual replacement with a resultant increase in maintenance expense.

A motor cover designed to overcome this objectionable feature was fastened permanently to the motor shell and was provided with a self-closing inspection door, as shown in the accompanying illustration. This new cover was made from a solid piece of $\frac{3}{8}$-in. plate of approximately the same over-all dimensions as the old cover. A rectangular hole 5x15 in. cut out of the center of this plate provides for access to the commutator and brush-holders for inspection and repair work. The motor shell was drilled and tapped and this solid plate was bolted permanently by $\frac{3}{4}$-in. bolts. A sheet iron cover of $\frac{1}{8}$-in. plate was made up to cover the rectangular hole in the $\frac{3}{8}$-in. plate. This cover was rod hinged to the $\frac{3}{8}$-in. plate and fitted with a spring which closes it and keeps it closed at all times when in service.

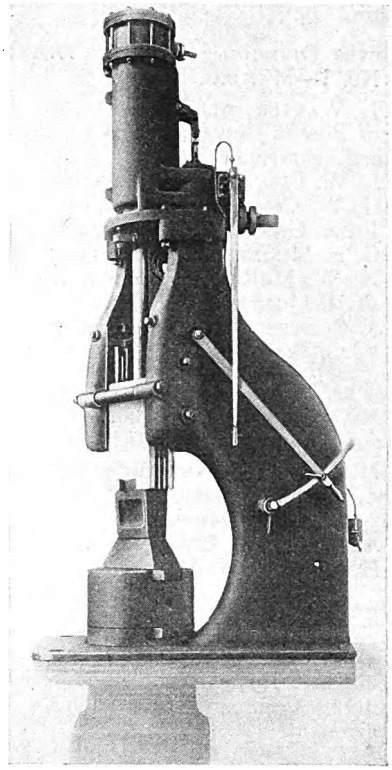
New Equipment Available

Combined Fuse Puller and Screw Driver

FUSE puller and screwdriver are combined in a device just placed on the market by the Trico Fuse Manufacturing Company, Milwaukee, Wis. This little tool is made of horn fiber and is 5 in. long. One end has gripping jaws for handling small cartridge fuses $\frac{1}{4}$ in. to $\frac{1}{2}$ in. in diameter. The other end has a screwdriver for use on small screws such as are used in lighting sockets, plugs, etc. The insulation prevents shorts as the screwdriver blade is the only metal and this extends but $\frac{3}{8}$ in. beyond the fiber handle.

High-Frame Guided-Ram Hammer

GREATER working space than is found in the usual types of air or steam hammers is provided in a type just brought out by the Chambersburg Engineering Company, Chambersburg, Pa. The increased clearance between the die and the under side of the frame increases the capacity. Particular attention has been given to the cylinder design. Deep stuffing boxes make better joints and the self-draining cylinder dispenses with long delays necessary



High-frame hammer

to pump the condensate. The throttle valve is of the rotary self-seating type and the operating valve is ground into a removable cage. Both give great steam or air efficiency.

Correct vertical alignment is secured by machining parts in jigs. The guide-adjusting wedges are positioned independent of the guides and have a full bearing to avoid the rocking tendency. Tie bars reinforce the frame at the guides. The ram has a longer bearing in the guides and guide ways than are generally employed.

The safety cylinder cover provides a cushion of live steam or air at the top of the cylinder not subject to the pumping of the hammer. This limits the stroke to protect the cylinder and eliminates the hazard and expense of broken cylinder covers in the event of rod breakage or loosening.

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American Association News

Engineering Association Committee Appointments

SIX more committees of the Engineering Association have had their personnel completed, according to announcement from association headquarters. They are given below. In addition it is announced that H. L. Rogers has resigned from rolling stock special committee No. 9 and that his place has been filled by the appointment of E. R. Rath, Cincinnati, Ohio.

POWER DIVISION—SPECIAL COMMITTEE No. 1—MANUAL REVIEW

J. WALTER ALLEN, electrical engineer Boston Elevated Railway, Boston, Mass., chairman.
L. W. BIRCH, Mansfield, Ohio.
H. W. CODDING, Newark, N. J.
JOHN LEISENRING, Springfield, Ill.
G. F. MCCLELLAN, New York, N. Y.
H. W. MCROBBIE, Connellsville, Pa.
W. J. QUINN, New York, N. Y.
A. SCHLESINGER, Indianapolis, Ind.
R. G. WINANS, New York, N. Y.

POWER DIVISION—SPECIAL COMMITTEE No. 13—PROPER TROLLEY VOLTAGE FOR CONGESTED CITY DISTRICTS

M. W. COOKE, superintendent power and incline Pittsburgh Railways, Pittsburgh, Pa., chairman.
A. J. KLATTE, Chicago, Ill.
H. S. MURPHY, Philadelphia, Pa.

ROLLING STOCK DIVISION — SPECIAL COMMITTEE No. 2—MOTOR COACHES

V. W. BERRY, assistant general manager of railways Virginia Electric & Power Company, Richmond, Va., chairman.
S. B. COOPER, East Pittsburgh, Pa.
H. L. DEBBINK, Milwaukee, Wis.
WILLIAM DOWNEY, Buffalo, N. Y.
H. C. EDDY, Newark, N. J.
F. A. KLOCK, Highwood, Ill.
L. H. PALMER, New York, N. Y.
A. J. SCAIFE, Cleveland, Ohio.
C. W. STOCKS, New York, N. Y.
G. W. WILSON, Schenectady, N. Y.

ROLLING STOCK DIVISION — SPECIAL COMMITTEE No. 10 — WELDING OF WHEEL FLANGES

J. S. MCWHIRTER, superintendent of equipment and buildings Third Avenue Railway, New York, N. Y., chairman.
A. D. BISSELL, East Pittsburgh, Pa.
R. S. BULL, Pittsburgh, Pa.
J. A. DUFFY, Fairmont, W. Va.
C. F. GAILOR, New York, N. Y.
M. O'BRIEN, St. Louis, Mo.
C. A. BURLESON, Schenectady, N. Y.

WAY AND STRUCTURES DIVISION—SPECIAL COMMITTEE No. 13 — JOINT RAILWAY AND BUS TERMINALS

E. D. ECKROAD, chief engineer ways and structures Northern Ohio Power & Light Company, Akron, Ohio, chairman.
J. I. CATHERMAN, Springfield, Ill.
R. J. CUSTER, Columbus, Ind.
T. H. DAVID, Indianapolis, Ind.
D. J. GRAHAM, Youngstown, Ohio.
F. A. KLOCK, Highwood, Ill.

WAY AND STRUCTURES DIVISION—SPECIAL COMMITTEE No. 16—FOUNDATIONS FOR SPECIAL TRACKWORK

H. A. ABELL, engineer way and structures New York State Railways, Rochester, N. Y., chairman.
R. B. BROKAW, Peoria, Ill.
P. A. MEYER, Connellsville, Pa.
J. C. NEWMAN, Norfolk, Va.
J. H. SUNDMAKER, Cincinnati, Ohio.
D. H. WALKER, Indianapolis, Ind.

Safety Committee Announced by Claims Association

PRESIDENT J. S. KUBU of the Claims Association has announced the full personnel of the committee on safety. This committee is the successor of the former committee on traffic and safety, the membership of which was made up jointly from the Claims and Transportation and Traffic Associations. The list of members follows:

H. K. BENNETT, safety manager United Electric Railways, Providence, R. I., chairman.
A. D. BROWN, Syracuse, N. Y.
H. E. CADY, Utica, N. Y.
J. R. COMPTON, Birmingham, Ala.
R. H. FERGUSON, Chicago, Ill.
J. W. GILTNER, Akron, Ohio.
G. H. INGLES, Richmond, Va.
A. G. JACK, Wilmington, Del.
P. W. KLABUNDE, Milwaukee, Wis.
T. C. NEILSON, East St. Louis, Ill.
J. M. ORTS, Newark, N. J.
J. J. REYNOLDS, Boston, Mass.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Dec. 7—Power Transmission Association, annual meeting, Hotel Commodore, New York, N. Y.

Jan. 16-17—Midwest Electric Railway Association, Hot Springs, Ark.

Jan. 18-19—Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.

Jan. 25-27—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.

Jan. 26-27—Central Electric Railway Association, Cincinnati, Ohio.

Jan. 31—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.

Engineering Subjects Announced

GENERAL SECRETARY J. W. WELSH has within the past few days sent to all members of committees of the Engineering Association the subject assignments for 1928. Each committeeman has been furnished with a complete list of all subjects for the various special committees in the division with which he is identified, so that he will be in close touch with all the work that is being done along similar lines with that in which he himself is involved.

Motion Picture and Sterepticon Division Organized

PLANS have been completed for the establishment of a motion and stereopticon picture division of the advertising section of the American Electric Railway Association, and distribution of material is about to begin.

Two films, one entitled "Wheels" and dealing with traffic congestion, its causes and methods of relief, and "Carrying On," a picture dealing with the readiness of electric railways to furnish service 24 hours a day, rain or shine, now are ready for distribution. These reels are about 1,000 ft. each in length, and require from twelve to fifteen minutes to run. They are captioned in such a manner that they may be used in any community. The pictures originally were taken in Chicago, and, through an arrangement with the Chicago Surface Lines, thence were recaptioned and nationalized. Although Chicago scenes are shown, the pictures are very general in character, and will be followed with interest wherever displayed.

Other films are in the course of preparation and announcements regarding their completion will be forthcoming soon. At present, the association plan is to confine all pictures to 1,000 ft., or one reel.

Standard size, non-inflammable film will be used on all pictures. They will be shipped in heavy cases, specially made for this work. Films may be either bought outright or rented. Companies will be charged for the use of films only during the actual time they are in the possession of companies. A minimum charge of $5 will be made for the use of any film. For this amount any member company may use a film three days or less. A charge of $1 per day will be made for each additional day that each film is in the possession of any company, regardless of whether it is shown or not. No charge is made for the time required to send or return a film.

If two copies of the same film are desired at one time in order to make showings in more than one place, the rate will be just double that charged for a single film. The association is completing arrangements with a Chicago still film and camera manufacturer to supply members with a stereopticon film service. The exact cost of this service has not yet been determined.

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News of the Industry

Service Readjustments in Providence

Management plans a number of important changes in the interest of economy —To discontinue freight

PLANS being made for bettering transportation service in Providence, R. I., as rendered by the United Electric Railways are gradually being unfolded to the public by the management there. These plans are wide in their scope, applying as they do to nearly all branches of the service. The company is at present seeking permission from the Public Utilities Commission to abandon practically all of its trolley freight service. The company has also proposed to substitute one-man cars for the two-man conveyances now in use on the Atwells Avenue line. Extensive substitution of one-man cars for the double-end vehicles on most of the lines also is planned. President Luke C. Bradley has denied that one-man cars will be used all over the system, but said the aim is to "put one-man service in Providence where it will furnish service as good as or better than is given at present."

One-Man Cars an Economy

Mr. Bradley said that it is possible to give more frequent service at the same expense with one-man cars than with the two-man cars. On such routes as the Pawtucket line, however, one-man service would not be so satisfactory as the present arrangement. He pointed out that the Eastern Massachusetts Street Railway, the Worcester system, the Springfield lines and the Newark, N. J., service are now "practically 100 per cent one-man services."

In 1923, the U.E.R. carried 138,578,000 passengers. In 1926 it carried only 103,319,000 passengers. The company carried 1,651,000 fewer passengers during the first eight months of this year than during the corresponding months of last year. The monthly loss in gross revenue this year has averaged between $18,000 and $29,000. Notwithstanding the decrease in patronage and gross revenue, the company has operated virtually the same number of miles, both by bus and street car. The service mileage in 1923 was 16,783,000, whereas in 1926 it was 16,661,000, a decrease in three years of only 122,000 miles.

Despite this, net income has improved, due entirely, according to Mr. Bradley, to economies in operation. Figures furnished the Public Utilities Commission recently showed the railway to have obtained 50.22 per cent more net income in the ten months preceding Oct. 31 this year than in the corresponding months of 1926. For October of this year alone the net income was $43,532, compared with $17,418 for October of last year.

Mr. Bradley asserted the maintenance of railway service is as much a matter of public concern and co-operation as it is of management. Part of the decrease in railway patronage he attributed to the great increase in automobile ownership.

Mr. Bradley specified one "useless and unnecessary" service as the competition between bus and railway lines both operated over a single route by the United Electric Railways. In some such cases, he asserted, neither the trolley nor the bus routes pay at present, although elimination of one or the other would put the remaining service on its feet.

William B. Spencer, assistant to the president of the company, recently told the Pawtuxet Valley Board of Trade that the company will discontinue its railway service between Providence and Washington after the first of the year, and will extend the present bus service, now operated as far as Arctic, to Washington, in order to accommodate patrons now served by the railway.

One of the matters the company now has before the Public Utilities Commission is the abandonment of its freight service. At a recent hearing on this subject Herbert Shaftoe for the company said he had urged the abandonment of the freight service after he had discovered the yearly losses through an analysis made at the request of President A. E. Potter, and after other officers of the company had advocated abandonment. Mr. Shaftoe said that early in 1924 he was requested by President Potter to make a study of revenues and expenses of the freight department, and that at that time another company official declared that "there was nothing in the trolley freight business" and ultimately it would have to be abandoned.

More Reports in Chicago

City Council hears report of Faherty's foreign subway inspections. Discusses plans for early start on Chicago's subways. Surface lines franchises to be extended once more

ENTHUSIASM is on the wane again in Chicago over prospects for an early beginning on the long-delayed subway system. Anticipated difficulties due to a recent controversy between the Board of Local Improvements and the City Council as to which body will have authority to initiate subway construction seem to have been averted and, from that quarter at least, harmonious action is now assured. The present law gives this power to the Board of Local Improvements, with the Council authorized only to approve or disapprove the board's program.

Appearing before the local transportation committee of the City Council on Nov. 22, following his return from an inspection trip of European subway systems, Michael J. Faherty, president of the Board of Local Improvements, announced that he is ready to begin digging as soon as the City Council smoothes out the legal and financial difficulties. Mr. Faherty was met as he arrived in New York last week by a subcommittee of the local transportation committee bearing the engineering plans recently drafted by Major R. F. Kelker, Jr., city engineer, for a comprehensive system of tubes.

In presenting his formal report of the inspection trip Mr. Faherty issued this warning to the Aldermen:

> I have been hearing aldermen and legislators wrangle over subways for eight years. I know that unless the traction people agree among themselves and unless the City Council and the State Legislature agree, all of you will be talking for years and nothing will be done. We can't build subways until provision is made for both surface and elevated lines. The city cannot buy the elevated lines or build a loop subway for them alone, because some taxpayer will rush into court and claim that the city's traction fund was raised from the nickels of the surface car riders. All parties must get together.
>
> When the City Council frames it so that we can dig legally and when they tell us how to get the money, the Board of Local Improvements is ready to build subways finer than those in any city in the world.
>
> We have nothing to fear from engineering difficulties. The Chicago soil is better suited to subway building than that of London or Paris, but in Berlin, with its sand and gravel foundation, they have it easy. In London they have to dig down 40 ft. or buy the property overhead. That is one problem we shall not have to face.

One of the first steps in the program, Mr. Faherty pointed out, will be the construction of a working model of the proposed system in order to save possible engineering mistakes. The necessity for this, he explained, was strongly impressed upon him when visiting the London subways.

According to the city Corporation Counsel's office, three possible courses are open to the City Council in overcoming legal and financial obstacles. First, the Legislature might be asked to pass the new transit bill which specifically authorizes subway construction by special assessment. This method, although it would be safest legally, would be slow because it would be necessary to postpone construction until the complicated questions of transit consolidation, home rule and indeterminate permits are settled by

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legislative action. Second, the Council might proceed with the work under the local improvement act as it now applies, taking the stand that a subway is simply a "lower level street" and therefore no different legally from a new surface street, pavement or sewer system built as a local improvement and paid for by bond issues and assessments against the property owners benefited. In such a case, the Board of Local Improvements could start spreading assessments at once, but the necessary court action on assessment proceedings, it was pointed out, might cause considerable delay. As a point in favor of this system, several Aldermen recalled that between 75 and 95 per cent of all property owners on State and Wells Streets last year agreed to voluntary assessment.

The third method suggested is the appropriation of the present $55,000,000 city traction fund as a special improvement. This plan is not being considered very seriously, however, because by using the traction fund the city would have to forego the use of assessment money unless property owners would contribute a share voluntarily.

ENABLING BILLS ADVANCED

As a result of Mr. Faherty's pledge of co-operation to the Aldermen and the popular desire to speed up the legislation necessary to effect a traction settlement and to start building subways, four of the five transit enabling bills —those dealing with a local transit commission, consolidation of transit facilities, indeterminate permits and the amending of the present act which limits franchises to twenty years—were approved by the full committee on local transportation at its meeting on Nov. 29. The new bills would give the city the added authority to solve the traction problem. They were immediately submitted to executives of the companies for examination, with the request that the latter meet with the Aldermen on Dec. 9 to straighten out any differences. No action was taken on the fifth bill authorizing subway construction.

For the third time in the past ten months the franchises of the Chicago Surface Lines have been extended again, this time for a 30-day period, effective Dec. 1, pending settlement of the entire transportation problem. Renewal of the present extension under which the street car lines have been operating since Aug. 1 was approved on Nov. 23 by the City Council. Although the understanding with the companies had been that nothing could be done to clear up the franchise situation until the city had completed its draft of the new traction bills, Mayor Thompson has declared that this will be the last extension that will be given to the companies. "The companies have got to come in and play ball with us," he said, "or they are going to find themselves in a bad hole about Jan. 1."

In answer to the Mayor's ultimatum, Leonard A. Busby, president of the Chicago City Railway, said that he is prepared to come before the transportation committee at a moment's notice to discuss the city's legislative measures and negotiate for a settlement. Mr. Busby agrees with the Mayor as to the importance of immediate action, but added that it was highly improbable a settlement could be reached in 30 days.

Better Copy Contest by Utilities Advertising Association

The Public Utilities Advertising Association has started a Better Copy Contest to encourage the continued development of public utility advertising and to award recognition to outstanding advertisements, according to Donald M. Mackie, president. It will embrace the entire field of public utility operation, but will be operated in three distinct divisions, covering separately the fields of electricity, gas and transportation.

The national utility associations, including the National Electric Light Association and the American Gas Association, embracing in their membership practically all public utility organizations, have indicated their interest in the plan and have offered their cooperation in assisting toward the success of the contest. To this end arrangements are being made between these national associations and the Public Utilities Advertising Association whereby the national bodies will make the awards for the winning advertisements in their respective fields. The plan contemplates the awarding of a certificate of merit for the best advertisement together with honorary award for second and third places in each of the three fields of utility activity embraced in the contest—electricity, gas, and electric and bus transportation. The contest will be conducted by the better copy committee of the Public Utilities Advertising Association, Irving M. Tuteur chairman, and the judging for awards will be made by a committee of judges representing the national associations.

The contest is open to all public utility operating companies and will cover advertisements released during 1927 and the early part of 1928 up to a date to be announced by the committee. All subjects dealing with public utility operation and service are eligible in their respective divisions and will include advertisements released in newspapers, periodicals, by direct mail or other media.

The winning advertisements, together with a selection of 500 advertisements chosen from among those submitted, will be published in the 1928 edition of "500 Representative Public Utility Advertisements" to be issued by the Public Utilities Advertising Association in the coming midyear.

The Public Utilities Advertising Association includes in its membership the advertising and publicity managers of practically all important utilities in this country and a number in Canada, together with representatives of publications, advertising agencies and organizations in the public utility field.

Baltimore Considers Fare Opposition Side

Opposition to a plea by the United Railways & Electric Company, Baltimore, to charge a 10-cent fare instead of the present 7½-cent rate is now being heard by the Maryland Public Service Commission. The company's side of the case has been concluded. In an effort to conclude the case as soon as possible both sides have agreed to submit briefs on the day the final arguments begin. The commission may be able to hand down its decision before the new year.

Cincinnati Company Seeks to Accelerate City's Program

The Cincinnati Street Railway, Cincinnati, Ohio, is seeking permission to borrow $750,000 for track repair purposes in order to co-operate with the city in its accelerated street improvement program. Under the new franchise the company was given four years in which to make improvements to the total of $1,750,000. Practically one-fourth of this amount has been spent in 1927. The improvements for 1926 were made out of earnings from the previous year.

Under the franchise the company would spend approximately $400,000 for improvements in 1928, but as the city wishes to improve more streets than this sum will replace tracks, it has become necessary for the company to have more money.

The entire question resolves itself into whether or not the company will be permitted to anticipate its earning for the next two years. Under the franchise it is not permitted to do this, and if Council grants permission to borrow the money it will be necessary to amend the franchise ordinance.

Walter Draper, president of the company, said that after the improvements are made there naturally will be less annual outlay for track and car maintenance, and that he also looked for an increase in patronage.

Parlor Car Service in Scioto Valley

On its parlor car limited service, the Scioto Valley Railway & Power Company, Columbus, Ohio, is operating luxurious cars patterned after the Western steam observation car equipment, except that the rear platform is glass inclosed. A small excess fare is charged, the largest amount being 25 cents. In this service the public is given individual chairs, deeply upholstered. It appears that the public is appreciating this equipment as it is liberally patronizing the cars. In its passenger and freight time table, the company recommends that the "Mount Logan," the "Lord Dunmore" and the "Mount Pleasant," parlor chair cars, be used by the public for their speed, luxury and economy.

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1928 Model Proclaimed a Winner

Brooklynites turn out in big numbers to try out new car. Attractive, comfortable and safe. Management gratified at public's receptivity

A RUSH HOUR which begins at 10:30 and ends at 4:30 is something to reckon with in railway travel, but when the operators and riders keep on smiling, that is something to write home about. Some riders wouldn't even leave the car. One outspoken burly fellow who apparently had found more than bliss in married life exclaimed: "I wouldn't go home nights if I could stay in these seats." To which an old and wrinkled mother responded enthusiastically: "Sure and it's heaven."

These and similar spontaneous and frank comments were provoked by the 1928 model electric car proposed for use on Brooklyn's surface lines and exhibited at Borough Hall, Brooklyn, on Nov. 29 and 30. Here, under sultry skies, the "Pink Lady" received more than 10,000 ardent and curious subjects. There were business men bound for Manhattan, women shoppers, students fortified with slickers and pipes and park bench squatters who left their beloved places in the shadow of the Brooklyn Borough Hall long enough to sample more comfortable seats.

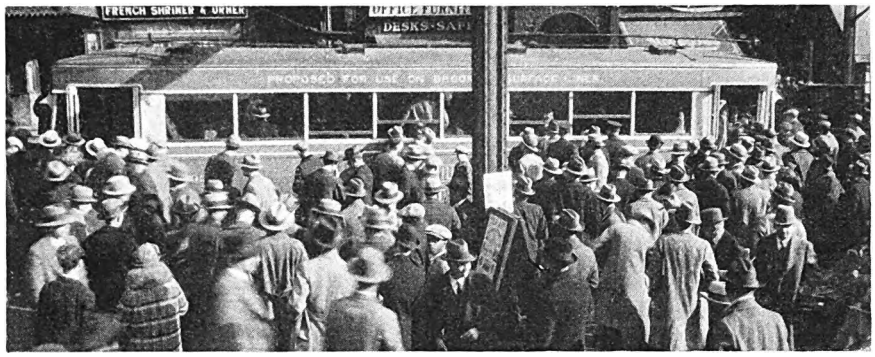
A jolly conductor, rotund in figure and orotund in voice, urged all to walk right through. At his solicitation the curious and interested sank in the leather-upholstered seats, took in the unobstructed view afforded by the vestibule windows and admired the mahogany panels at each end of the car which concealed the operating apparatus. Once the scientific scrutiny was interrupted by a raucous voice, "Oh, for the life of a motorman," when the discerning passenger observed the operator's seat of leather at each end of the car.

The racy looking body of the car, in old rose (clover club) with buff decorations, the interior lighting effects, motors and brake equipment competed for interest with the treadle door. As the passengers stepped upon a plate at the exit the treadle door opened automatically, but only, as one cicerone explained, when the brakes on the car had been fully applied. Then these passengers stood outside to watch the next person alight. He in turn joined the vast army of awed spectators.

Comment Elicited Without Coaxing

Company's representatives walked in and out among the people, showing pictures of the cars and announcing the purpose of the new equipment, which is to be operated for a short period on the DeKalb Avenue line and then will be transferred for a further period of experimental operation to the Seventh Avenue line. Although the management wanted the people to know these details it was more concerned with their reaction, and so sought comments and suggestions on cards distributed as the people boarded the car. Spontaneous response, such as "Henry Ford's new model has nothing on this" and "What will all this decoration cost us," were appreciated by the representatives of the company present, but the written opinions were considered more thoughtful and hence more indicative. By and large, these opinions indorsed the 1928 model for greater comfort, less noise, more attractive appearance and more efficient and economic operation. A few regarded such lavish facilities impossible on a 5-cent fare. Many extolled the comfort of the seats. A little adverse criticism was leveled at the low exit and the seating arrangement, considered by some to make clearances too narrow. One meliorist went so far as to draw a diagram of his idea.

A complete account of this model car will be published in the Electric Railway Journal, issue of Dec. 10.



A scene from "Public Relations," staged in open-air theater near Borough Hall

On free admittance crowds stormed entrance to see model car

Seattle After the Parked Taxi

In a controversy before the public safety committee of the City Council of Seattle, Wash., over an ordinance which would abolish all downtown parking stands for for-rent vehicles, particularly taxicab parking, Councilman W. T. Campbell appeared on behalf of the municipal railway, declaring that it would be greatly benefited if the taxicab and for-hire vehicles were required to park their cars elsewhere than on city streets. Action on the measure was deferred for one week.

Oneida Receiving Reasonable Service

Because the New York State Railways was rendering a reasonably frequent service to those within walking distance of its lines the Public Service Commission denied a certificate to the Clark Motor Service for a line over certain streets in the city of Oneida now operating an interurban service under a resolution by the Common Council on Aug. 10 last. The commission held that public convenience and necessity do not require the operation of the bus lines. Operating losses by the New York State Railways in Oneida have increased from $7,273 in 1924 to $17,337 in 1926.

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Finishing Touches Being Put to Milwaukee Program

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is now completing its 1927 program of city and suburban railway track extension and reconstruction.

A double-track extension has been built along Teutonia Avenue from Nash Street to Atkinson Avenue. On Eighth Avenue tracks have been extended from Oklahoma Avenue to Ohio Avenue. On Atkinson Avenue between 27th and 32d Streets, the company has laid new double tracks, foundation and pavement in place of the former single track.

Major track reconstruction jobs included Third Street, Center to Burleigh; Juneau Avenue, Third to Seventh; Kinnickinnic Avenue, California to Linebarger; National Avenue, Clinton to First; Wells Street, viaduct to 52d; Broadway and Wisconsin Avenue, new intersection. The tracks and track zones now built are calculated to endure for more than 25 years.

Ten new one-man safety cars have been purchased for city and suburban service. Delivery is expected on Dec. 30. These cars will be used to meet an expected increase in travel this winter.

Operation of one-man, electrically heated safety cars was begun on the Eighth-Muskego line recently, and application has been made to the Railroad Commission of Wisconsin for authority to improve service on the State Street line in similar manner.

Labor Injunction Hearing Put Over Until Dec. 21

Further adjournment until Dec. 21 was granted by Supreme Court Justice Wasservogel for argument on the motion of Interborough Rapid Transit Company, New York, for an injunction to restrain the representatives of organized labor from soliciting membership among the company's employees. This is the second adjournment. The request for the postponement was made by Nathan D. Perlman, representing organized labor. It was not opposed by attorneys for the company.

$12,000,000 Canal-Bed Subway Opened in Rochester

Rochester's municipally owned $12,000,000 subway in the bed of the abandoned Erie Canal was opened to passenger service on Dec. 1. The New York State Railways is to operate the line for a three-year trial period under the service-at-cost contract by which the company operates the railway and bus lines in Rochester. The Rochester & Syracuse Railroad also will divert its interurban cars from the city streets to the subway, which connects at Brighton with the tracks of the interurban.

Work was begun on the subway five years ago. Rochester is considered the smallest city in the United States with a subway of any length, the line being 7 miles long and cutting through the heart of the city.

The five steam railroads entering the city also will use the new line, giving added switching facilities to industries along the route. Separate contracts for the different roads using the service have been negotiated.

The test period during which the New York State Railways will operate the subway railroad was set at three years because the service-at-cost contract governing operation of the surface lines expires at that time.

Pittsburgh Interurbans Install New Rates

Ride-selling fares include zone, ticket, group mileage, coupon book and children's privileges. All schemes on trial basis. Response more than satisfactory to company

DURING the latter half of 1927 the associated Pittsburgh, Mars & Butler (Mars route) and Pittsburgh, Harmony, Butler & New Castle Railways (Harmony route) in Pennsylvania initiated several changes in fares to encourage various classes of patronage. Each was put on for a trial period, but extensions have been made in every case because of the satisfying riding response from the public. The ultimate financial value of the experimental rates is still difficult to estimate because they were installed during a period of industrial depression, when revenue was declining in any case.

A $1 fare was established as of July 1, 1927, as the maximum from any one point on the system to any other, exclusive of the Pittsburgh entrance over which the Pittsburgh Railways charges its usual one-zone rates of 10 cents cash, 8⅓ cents token or $1.50 weekly pass. This $1 rate represents a reduction over rides of fifteen to 26 zones costing $1.05 to $1.82 at the ticket rate of 7 cents per zone of 2 miles per zone. A corresponding ticket, good for children five to twelve years of age, is sold for 50 cents.

Any-Day Round-Trip Rate

As of Aug. 31, 1927, a special round-trip rate of $1.50 from any point to any other point on the company routes (exclusive of Pittsburgh local fare) was made for Wednesdays, that day being the lowest of the week. There is no corresponding rate for children. Both types of tickets are sold by conductors as well as ticket agents.

The management started a different style of any-day round-trip rate, intended for semi-regular riders, as of Aug. 2, 1927. Owing to the decline in employment locally, it was desirable to do something for patrons who would buy monthly commutation if employed six days a week but who are now on a part-time basis. These round-trip tickets are made up in strips of five pairs per book, and a different color is used for "going" and "returning." These round-trip or "group mileage" tickets are good for 30 days. They are sold only through the agents. The latter write the origin and destination on the cover to avoid the need for printing a special ticket for each combination.

The group mileage tickets are sold for blocks of two to six zones, which takes care of the greater part of the riding, but a patron can buy two types of books, such as a three-zone and a six-zone, if he happens to be a nine-zone round-tripper. The prices of these books range in 50-cent steps from $1 to $3 inclusive for the two-zone to six-zone combinations. Their popularity suggests that they are meeting very well the condition raised by part-time employment. These tickets cost about 14 per cent less than mileage.

Still another, and probably the greatest, innovation is what has been cleverly termed a "local community service" tariff, effective Oct. 20, 1927. During 1926 the tariff had been raised from 7 cents to 10 cents per zone cash, with ticket rates at 7 cents per zone. This was roughly equivalent to 5 cents and 3½ cents per mile respectively, but 10 cents was required of an adult and 7 cents cash of a child five to twelve years for a ride which might be only 1 mile between stops.

Although the usual headway on each route is an hour, many of the residents along the route had adjusted themselves so well to the schedule that there was a notable amount of short-haul travel. This was impaired by the increase to 10 cents cash minimum.

The problem before Harry Etheridge, vice-president and general manager, was to recover this traffic and yet retain a high average fare per mile. This he achieved by originating a strip ticket made up of 1-cent coupons in books of 25 cents, 50 cents and $1. Five such coupons pay for a ride to the first fare point, 7 cents to the second fare point, 11 cents to the third fare point and 14 cents to the fourth fare point, which constitutes the maximum distance for a fare especially devised to encourage shopping and visiting under the name "local community service."

This 1-cent coupon rate has proved very popular because of its low starting rate and general convenience. Yet the actual rate per mile works out at 5 cents to the first fare point, 3.5 cents to the second fare point, 3.66 cents to the third fare point and 3.5 cents to the fourth fare point. At times the demand for the 25-cent and 50-cent books has been like the run on a bank.

These 1-cent coupon books are sold both by conductors and agents. The user is at liberty to pay for others

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with this transportation. The same privilege holds true of the group mileage round-trip tickets, except that the latter have a 30-day time limit.

The management also made certain reductions in its non-transferable 60-trip adult and 44-trip children (five to eighteen years) calendar month commutation as of Sept. 1, 1927. A 40-ride, six-month family ticket averaging about 3 cents a mile is another element in this company's endeavor to have a fair rate for each class of travel.

No Controversy in Houston

Since Park Place became a part of the city of Houston, Tex., the Houston Electric Company, under Stone & Webster executive management, has been furnishing interurban service at a cash fare of 12 cents, or 10 cents when tickets were purchased, with half fares for students and children. Prior to its inception into the city it was served by the interurban line running between Galveston and Houston. After its inception it became necessary for the Houston Electric Company to render service to the community or else make arrangements with the Galveston-Houston Electric Railway, which is under the same management, to furnish this service. The people of Park Place expressed a desire to have the interurban service continued. The fare had been 18 cents.

The company wishes to have it made plain that there was no "fight" over this issue and further states that the possibility of express service to West End and Houston Heights, mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 5, 1927, page 878, was merely talked about among the officials, but that nothing definite has been done or determined.

Elsewhere in this issue is an article entitled "Houston Electric Company Makes Good Its Promises." The article points out that the growing attitude of co-operation between the public and its transportation company is beginning to show the full measure of its possibilities both for the development of the city and the improvement of local service.

$10,458,034 Subway Loop Awards Let in New York

Two contracts totaling $10,458,034 for the construction of the Nassau-Broad Street subway loop of the Brooklyn-Manhattan Transit Corporation system have been awarded by the Board of Transportation. One section of the new link, that from the Municipal Building at Park Row to Liberty and Nassau Streets, will be built by the Marcus Contracting Company, which was the successful bidder at a price of $4,772,885 for the section. The other section, from Liberty Street to Broad and South Streets, will be constructed by Moranti & Raymond, who bid $5,735,149.

The construction of the Nassau Street subway has been delayed for ten years, among other things, by legal as well as political controversy. For alleged failure to construct the link in accordance with the contract the city is being sued for $20,000,000 by the B.-M. T. The city and the company have disagreed since the first part of the Hylan administration as to the necessity for the completion of the loop, the city being inclined to drop it. The city once offered to build the loop on condition that the B.-M. T. would discontinue its suit. The offer was refused.

Completion of the loop will make it possible to operate trains over the Williamsburg and Manhattan Bridges to the Municipal Building and thence back to Brooklyn via Nassau and Broad Streets and the Montague Street tunnel to De Kalb Avenue.

Former New York Commissioner Criticises New Unification Plan

George McAneny, former Transit Commissioner, criticised as impractical on Nov. 29 the plans at present being considered to relieve the transit situation in New York City. He spoke at a luncheon of the Real Estate Board in Manhattan. Mr. McAneny began by saying that in his opinion, some changes of public policy should be made, and possibly a different method of approach on the part of the civic bodies taken if real progress is to be made. He said:

What the city needs is a unification of existing lines upon a practicable working basis, with the broadest of transfer privileges; the linking, so far as possible, of both old and new lines with this object in view; the rehabilitation of the existing lines as the nearest measure of relief, and the expansion of their facilities to the farthest possible degree.

He went on to say that the city, instead of setting out in a business-like manner to do these things, is wrangling about dollars and cents. Actual unification, either physical or corporate, is going to prove a slow process, according to Mr. McAneny, who said:

In 1921 it could have been done. The companies were then in the doldrums. That was the day for bargains. But the plan of unification then proposed encountered the stone wall of Hylan stupidity. But for that it probably would have been carried through.

The situation today is different. The rapid transit lines are earning real money. They will not readily be dislodged from their present position, even if that were now considered desirable.

Going on to his own ideas for improvement, Mr. McAneny said:

What we need first of all is a remapping of that part of the proposed system now under construction in so far as better mapping is still possible; immediate application of the salvaged funds to such projects as the lengthening of local platforms upon the existing Interborough lines; the betterment of rolling stock and other equipment, and finally a really sane study of the whole matter of basic financing. "Plans" along these lines will be better worth discussing. I fear that the present proposals offer nothing but more delay, and the waste of present facilities.

Violators of Indianapolis Strike Injunction Must Serve Sentence

A fifteen months fight by John M. Parker and Robert B. Armstrong to evade a 90-day jail sentence imposed in federal court in Indianapolis, Ind., for violating an injunction during the strike of the employees of the Indianapolis Street Railway in July, 1926, was lost recently when Judge Robert C. Baltzell denied a petition to quash the charges and ordered the men to begin serving their sentences. They were taken to the Marion County jail a short time later by United States deputy marshals with Edgar Day, a striker, sentenced to 30 days on the same charge.

Parker and Armstrong, organizers of the local branch of the union, carried their case to the Circuit Court of Appeals. There the sentence was upheld. They charged the Indianapolis Street Railway had employed Harry Boggs, president of the local, to act as informant of the union activities and had purchased dynamite for Boggs to use as a means of creating public sentiment against the union. Boggs served a 60-day sentence for violating the injunction.

Judge Baltzell discredited the charges against the company, pointing out that the evidence had been reviewed before and that no indication of fraud had been discovered. Albert Ward, United States District Attorney, said the Department of Justice had gone into the charge that dynamite was purchased and that no evidence confirming this had been uncovered.

Parker and Armstrong charged that the railway obtained its anti-strike injunction by fraud and that the alleged threats of violence against employees on which the injunction was issued actually were made by railway agents.

James P. Tretton, superintendent of the railway, declared it was absurd to think the company would try to get people to ride its cars and then buy dynamite to blow them off the cars.

Honest Car Riders in Evansville

People who ride street cars in Evansville, Ind., are honest. This can be proved by Howard S. Butler, circulation manager of the Evansville *Courier*, a daily morning newspaper. Two or three years ago Mr. Butler installed "honor" boxes on the city street cars and on cars entering the city of Evansville. One is at liberty to take a copy of the paper and is expected to drop the money in a slot.

No one is at hand there to see that the money is deposited. It is strictly a matter of one's honor, Mr. Butler said. It is his conviction that his newspaper lost very little money on papers left in these boxes. The railways whose passenger cars carry these slot news boxes are the Evansville & Princeton, Evansville & Booneville, Evansville & Newburg and the Evansville & Ohio Valley Railway Companies.

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Fare Increase Sought on Utica Interurban

A petition asking authority to increase interurban fares between Utica and Little Falls, N. Y., was filed by the New York State Railways with the Public Service Commission on Nov. 22. It alleged that the present fares are insufficient to yield a reasonable compensation for the service rendered and are unjust and unreasonable. The company claims a gross loss on the interurban line of $11,658 for the nine months ended Sept. 30, 1927.

The schedule provides for increases in one-way and 50-trip ticket books both between the various stops and villages from Utica East. The special round-trip ticket rate of 6 cents in effect between the four Herkimer county villages is increased to 10 cents. The special round-trip ticket rate of 20 cents between Frankford and Forest Park is discontinued. In addition to other changes the schedule provides that tickets in strips of ten be sold for 75 cents. These tickets will be good for any 10-cent fare between stops 9 and 36.

"Enough Nickels a Day Will Help the Railway"

"Enough nickels a day will help the railway" is the slogan of Mayor Bertha K. Landes and D. W. Henderson, superintendent of the Seattle Municipal Railways, Seattle, Wash., for the little red cars which have been placed on the downtown run with a 5-cent fare for the short haul. The cars make a loop in the downtown business district. They were put into service to cater especially to the short-haul business. As indicated previously in the ELECTRIC RAILWAY JOURNAL, the first day's receipts were $61.31, the second $78.43, while the third were $95.01. When the fifth day showed receipts of more than $100, Mayor Landes became highly interested and went to the Jefferson Street carhouse to inspect the cars before they went out and to confer with Mr. Henderson.

If the 5-cent fare in the downtown loop proves successful it may be extended to other short lines. During the first week 10,306 passengers, including those riding on transfers or tokens, were carried by the loop cars.

Final Briefs in Schenectady Case

In a brief it is presenting to that body the Schenectady Railway contends the New York State Public Service Commission has jurisdiction over the matter of the fares that the railway may charge. In the brief the company also asks that the motion be denied which was made by M. P. Poersch, corporation counsel of Schenectady, seeking dismissal of the railway's petition for increased fares.

At a hearing in September, Mr. Poersch asked that the railway's petition be dismissed on the grounds that the Public Service Commission had no jurisdiction to specify fares on the lines within the city of Schenectady, since the rates were fixed by contract between the city and the company.

The railway points out that the early franchise agreement, containing a 5-cent fare provision, was superseded by others in 1911, 1919 and 1920. The 1919 ordinance authorized the commission to pass upon the company's application for an increase in fare from 5 to 6 cents; the ordinance of 1920 provided for a 7-cent fare.

At the hearing in September the commission reserved decision, pending submission of briefs.

Let the Motorman Be Your Guide

An accident for which a trolley car is responsible is a rare exception. Collisions between automobiles and the injury or death of pedestrians run down by them are so common as though it would cease to be news.

Observe the trolley motorman. He runs no risk. He does not wait for the situation of danger to arise. Before the situation is dangerous he has shut off the power.

How often do we see a motorist adopt a precautionary measure until the accident is almost too imminent to avoid.

If the motorman has an accident he must answer for it to a stern boss. The motorist may have to furnish a few explanations to a traffic judge, but the latter, a hundred to one, is a motorist himself and, at all events, such mishaps are an old story to him.

The motorist, found guilty of recklessness, seldom is penalized beyond a fine which he can well afford to pay. The motorman, convicted of gross carelessness, loses his job.

The motorman's motto is, "Safety First."

The motto of many a motorist is, "Take a Chance."—*Norristown Herald.*

Remission of Taxes in Poughkeepsie Discussed

Mayor Frank B. Lovelace said recently that if the Poughkeepsie City & Wappingers Falls Railway, Poughkeepsie, N. Y., requests the city to forego the interest and penalties on its debt, a special act of the Legislature will be required to permit the city to accept less than the full amount of the assessment bill. For this reason it would be impossible to clear up the entire matter until after the first of the year. The Mayor said it is not the purpose of his administration to attempt to settle all the matters in connection with the railway in the next month, but that he and his associates are attempting to formulate a plan and map out a course which the next administration may follow.

Without the penalties added the sum the railway owes the city is $190,000. The matter is being considered for settlement on that basis.

E. M. Dickens with Chicago Surface Lines 53 Years

For the first working day in more than 53 years Edgar M. Dickens of Chicago was not on hand on Nov. 10, when the starter down at the Chicago Surface Lines carhouse called his run. He, who is believed to be the oldest street car motorman in the United States in point of service, retired that day with the congratulations of Guy A. Richardson, vice-president of the railway. The 78-year-old railway man plans to live in California.

With a service record as old as the industry, Mr. Dickens acquired his first railway experience as a driver of horse cars in Chicago in 1873. He was assigned to operate one of the first cable cars in that city when they were put into service on the State Street line in 1881 and in 1907 was motorman of the first street car to be propelled by electric power in Chicago. Moving pictures of the aged veteran driving one of the original horse cars were taken by the *Pathe News* at the time of his retirement and shown in many local theaters.

Franchise Matter Up Again in Omaha on Jan. 15

Action on the matter of a new franchise for the Omaha & Council Bluffs Street Railway, Omaha, Neb., has been put over by the Council until Jan. 15. Meantime it is believed it will be possible to negotiate another franchise draft that will be satisfactory all around. The protective committee representing the bondholders is so thoroughly convinced of this that it is recommending that all bondholders deposit their securities so that the three years extension of the $9,000,000 issue due on Jan. 1 may be arranged.

The October report shows the company earned within $392 of its bond and other interests. Transportation revenue decreased $14,090, from $247,016 to $232,925; operating revenues from $251,615 to $237,847; operating expenses from $177,025 to $165,167, and operating income from $46,235 to $36,202. Taxes increased $6,800 for October, 1927, over October, 1926.

Minnesota Line Advances Rates

The St. Paul Southern Electric Railway, operating between St. Paul and Hastings, Minn., in the hands of a federal receiver, on Nov. 21 advanced rates and decreased its schedule. Application to the Minnesota Railroad and Warehouse Commission was not required under the circumstances. The one-way fare is 60 cents instead of 50, the round trip $1 instead of 95 cents, with ten rides for $4.50 still in force. To cut expenses the last car leaving Hastings at 9:40 p.m. is to be eliminated three days of the week and the owl car from St. Paul at 11:15 p.m. is to cease operation.

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Seattle's Woman Mayor Wants Attractive Cars for Railway

While waiting to hear from the St. Louis Car Company on the deal for the purchase of 80 new cars for the Seattle Municipal Railway, members of the City Council of Seattle, Wash., are trying to find a local market for $500,000 of bonds, so that the proposed steel trestle may be built across the West Dawamish Waterway. Both the trestle construction and the delivery of new cars have been blocked pending the recent federal court litigation involving the railway. But now that a ruling has been made favoring the railway, efforts are being renewed to bring the much-needed improvements.

Mayor Bertha K. Landes has appealed to the Puget Sound Power & Light Company and J. C. Von Herberg, as a duty toward Seattle, and as public-spirited citizens, not to press further the federal court suits they brought against the Municipal Railway to determine a priority lien on its revenues. The Mayor urges both parties to announce immediately an intention not to appeal from the recent ruling favorable to the railway of Judge Dietrich of the U. S. Circuit Court of Appeals.

Neither Mr. Von Herberg nor counsel for the power company has said whether an appeal will be made, but it is considered likely that the power company will continue its case, since the company wants a court ruling which would establish a priority for the holders of the purchase bonds. If such a ruling were obtained, Councilmen declare it would virtually block further railway bond issues. All improvements to the system would increase the value of the purchase bondholders' collateral, but would not indemnify holders of bonds issued to make the improvements.

Mayor Landes approves of the suggestion of Councilman W. T. Campbell to buy street cars of greater comfort and convenience than those planned originally. She believes that the cars should contain individual seats and possibly smoking compartments. Mr. Campbell estimates the additional cost for these features would be between $1,000 and $2,000 a car.

Freight Transfer Facilities Established by North Shore

Increased facilities for receiving and handling freight have been established by the Chicago, North Shore & Milwaukee Railroad with the completion of arrangements to receive shipments at four stations of the Illinois Tunnel Company, the narrow-gage electric subway system which transports freight beneath Chicago's downtown streets. The four stations are all located in or near the Loop district and are in addition to the eight regular receiving depots of the North Shore Line, located all over Chicago.

Arrangements have also been effected whereby the North Shore Line will handle through overnight shipments to many points in Wisconsin reached by the Milwaukee Electric Railway & Light Company, the Milwaukee Northern Railroad and the Wisconsin Power & Light Company's rail lines.

The increased service is made possible through the company's new flat car-motor trailer equipment, which eliminates many handling and transfer operations, according to E. F. Weber, general freight agent of the North Shore Line.

Receivers Keep Oklahoma Patrons Informed

An interesting advertisement which follows the policy of the receivers of the Oklahoma Railway, Oklahoma City, Okla., to keep patrons informed on financial affairs of the company appeared in the Nov. 9 issue of the *Oklahoma Railwayan,* house organ of the company.

A portion of the advertisement reads:

The money you drop in the fare box is divided in many ways. Figures of the last few months show that 39 per cent of it will go to pay the salary and wages of 680 persons who are on the company payroll. Another 10 per cent goes to buy new material, while taxes and interest on indebtedness will take another 22 per cent.

Compromise Plan in Decatur Fails to Win Approval

By a vote of 482 to 291 the citizens of Decatur, Ga., have rejected the compromise plan of the Georgia Power Company and will refuse to exchange the 5-cent fare to Atlanta for a 7-cent fare and the establishment of bus lines to the Emory University and Ponce de Leon car lines. The compromise offered by the company consisted of the establishment of two bus lines, one from Decatur to the Emory University car line and the other from Decatur to the Ponce de Leon car line, with a 10-cent fare, including the privilege of transfer to the car line. It also included the payment of a $14,000 street paving assessment against the company and the promise of assistance in other paving work in return for the abrogration of the present 5-cent fare.

The Georgia Power Company has made several efforts to have the 5-cent fare agreement with Decatur abrogated without success. The Legislature has repeatedly refused to pass the necessary laws and the Public Service Commission has several times declared the affair to be out of its jurisdiction since the agreement was made before the commission was created. Once the case was carried to the United States Supreme Court, the city of Decatur winning every decision.

Officials of the company state that at a 5-cent fare the interurban line is a losing proposition and they wish to place it on a 7-cent basis along with every other line operated by the company. However, the company cannot increase the fare under the present conditions and cannot suspend service on the line.

Compulsory Savings by Utility Company Employees

A utility company in Kansas has recently taken the position that every employee in order to remain in the company's service must save at least 10 per cent of his pay. The employee is asked to fill out a card each month showing how his savings are made. Savings acceptable to the company include installments on stock purchases, savings bank deposits, building and loan payments, life insurance premiums, payments on homes, and other similarly worthy methods of saving. The rule is enforced on the theory that the man who is careful about his own affairs will be careful of the company's interests also. Payments on automobiles for pleasure are not acceptable savings.

One-Man Car Issue Acute in Des Moines

Institution of one-man car service by the receivers of the Des Moines City Railway, Des Moines, Iowa, is thought to be only a matter of weeks since C. L. Herring, receiver of the company, has said that the order of Federal District Judge Martin J. Wade undoubtedly gives the receivers power to terminate the 25-year contract between the union and the company which makes it obligatory to use a motorman and a conductor on each car.

Weight is lent to Mr. Herring's declaration by the fact that his statement was made after he recently had a session with Judge Wade. Neither Mr. Herring nor the co-receiver, F. C. Chambers, would indicate the course of action likely to be taken when asked what their plans were for an economy program.

The auditor's monthly report for October, the last full monthly period prior to the receivership, showed that the railway is going deeper and deeper in debt under its present operating schedule and fares. The debit to the stabilizing fund for October was $20,191. This makes the aggregate deficit to Nov. 1 approximately $170,000. As the receivers have promised to continue the present service and fare rate, the general supposition is that they will turn to one-man car operation to bring operating expenses within the income. November has been unusually warm, and the indications are that it will also show a deficit.

Articles in Des Moines newspapers show that more than 400 cities of the United States have either all one-man or partial one-man car service.

New Crosstown Line in Dallas

The San Jacinto and the Trinity Heights lines of the Dallas Railway & Terminal Company, Dallas, Tex., are to be merged into a new crosstown line. George I. Plummer, traffic superintendent, has issued orders on the routes.

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Recent Bus Developments

Commission Approves Bus Purchase at Instance of Court

In its final order approving the petition of the Indianapolis Street Railway to purchase the People's Motor Coach Company for $500,000 the Indiana Public Service Commission expresses regret that it was not represented legally when the case came up in the Marion Circuit Court and indicates that Judge Harry A. Chamberlin was mistaken in his statement that the commission based its decisions in the case on "history" rather than on fact.

The commission's action was in compliance with the recent order of the court. The ruling followed the denial of the petition by the commission some months ago for the merger, a denial also by the commission of a petition for rehearing, appeal to the Circuit Court where a preliminary hearing was held, and a second announcement by the commission to the court reaffirming its original stand. After tracing the history of the case, the order quotes Judge Chamberlin's opinion as follows:

The Public Service Commission presented no facts to controvert those submitted by the petitioner and gave nothing to assist the court in sustaining its findings.

In response the commission says:

In this connection, the commission wishes to state that the Attorney-General is by law the commission's legal counsel; that the Attorney-General advised the commission that it cannot be a party in court procedure to an appeal taken from the commission's final order under the provisions of the acts of 1927 and, not being a party, cannot present facts upon its own initiative; that the commission was anxious to be present and participate in the proceedings on said appeal. The commission felt that it did not have the right to suggest to the court its willingness to take part in said proceedings and feels now that it followed properly the advice of its legal counsel.

The last order requires the motor coach company to maintain its corporate identity. The railway is directed to pay out of the operating revenues of the Peoples Motor Coach Company outstanding obligations amounting to approximately $92,000 at the time of the original public hearing before the commission. This is in accord with a contract made on March 25, 1927, between the railway and holders of common capital stock of the bus company.

Mitten Tour Terminal Moves

The Philadelphia, Pa., terminal of Mitten Tours, intercity bus operating subsidiary of the Philadelphia Rapid Transit Company, was moved on Nov. 30 from 237 South Broad Street to the ground floor of the Mitten Building, at the northwest corner of Broad and Locust Streets. With this change in location all Mitten Tours intercity buses will load and unload passengers on the north side of Locust Street, just west of Broad Street. The new terminal in the Mitten Building will provide a spacious waiting room with every provision for the comfort and convenience of passengers. Ample quarters are also provided for ticket and information desks.

All Mitten Tours buses operate from the garage located at 26th Street and Girard Avenue. Buses are dispatched from this point to the central bus terminal a few moments before scheduled leaving times. Incoming buses unload their passengers at the passenger terminal and immediately proceed to the 26th Street garage.

Buses to Replace Cars in Helena

The Helena Electric Railway, Helena, Mont., will cease to function as operator of a railway system at midnight, Dec. 31, and the Service Transit Company will begin a schedule of regular bus service over approximately the same streets now traversed by the cars. The bus firm is owned by R. P. Crago and L. F. Schroeder. This change is in accordance with the plan for the future operation of the utilities in Helena reviewed in the ELECTRIC RAILWAY JOURNAL for Nov. 26, page 1006.

Bus to Replace Discontinued Railway

The Connecticut Company has been authorized by the Public Utilities Commission to take up 1 mile of track in Stratford, Conn. Previously the commission had ordered the company to relay the track on another part of the highway to expedite the construction of a new road surface. The railway could not see its way clear to spend the $17,000 required for this work and petitioned for the right to discontinue service. The patrons in this section will be transported by bus.

Union Traction Receiver Would Enjoin Bus Company

Arthur W. Brady, receiver for the Union Traction Company of Indiana, has obtained a restraining order from the Circuit Court at Anderson, Ind., enjoining the Fort Wayne Motor Coach Company from operating a bus line along the route used by the Union Traction buses between Marion and Indianapolis, via Alexandria, Anderson, Fortville and McCordsville. The Indiana Public Service Commission, which had just issued a certificate of convenience and necessity for the establishment of the new bus line, was named defendant also. The railway considers the competition most unfair.

Would Operate Stage Line in San Diego

The San Diego Electric Railway has applied to the California Railroad Commission for a certificate of public convenience and necessity to operate Lloyd's El Cajon Stage Line, between the city of San Diego and the town of El Cajon. In a previous decision the applicant was authorized to acquire the property of this line.

Monticello Bus Line in Operation

Three new buses were placed in operation on Nov. 10 for the residents of the Monticello loop section of Clarksburg, W. Va., by the Monongahela West Penn Public Service Company.

The buses carry 23 passengers. Two of the vehicles are to operate regularly, with three during rush hours on a fifteen-minute service. These buses take the place of the car line formerly serving this section.

Decision Protects Indianapolis Company

Holding that the Indianapolis Street Railway should not be subjected to the competition of intercity bus carriers in Indianapolis streets over which the company operates lines, the Indiana Public Service Commission adopted an order Nov. 26 denying the request of the Hoosier Transportation Company for authority to receive and discharge passengers in West Washington Street. The order held that the service proposed by the bus company probably would be a convenience to the territory served, but that it was not a necessity. The bus company operates between Indianapolis and Terre Haute.

Details of Youngstown's Depreciation of Its Buses

Money has been transferred to the bus depreciation fund of the Youngstown Municipal Railway, Youngstown, Ohio, sufficient to pay for eleven buses which are still fit for service. These buses were delivered in February, March and April, 1923. They were purchased for $76,367, all of which has been transferred in monthly installments to the depreciation fund, which draws 7 per cent interest. As it is not necessary to replace the buses Railway Commissioner Engle says the $1,272 which has been transferred monthly to depreciate them now will be retained as earnings.

According to Mr. Engle there will have been transferred to the fund by Jan. 1 money sufficient to depreciate seven more buses, worth $47,551, and by Feb. 18 to depreciate six more, worth $45,554. Allowances of $792 and $759 have been made monthly to take care of these buses, which after those dates will remain in the earnings. From 4½ to 5 years is allowed for replacement of a bus, Mr. Engle said.

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Financial *and* Corporate

Tax Issue Raised

Cities said to be concerned about ruling in San Francisco municipal railway case, reviewed by local paper

A NEW tax issue appears to have been raised. According to a dispatch to the San Francisco *Chronicle* from Washington the United States Government will not attempt to collect a tax of 13½ per cent upon the net earnings of the municipally owned public utilities of San Francisco, except its bus lines. So far as the bus lines are concerned, the government has demanded and will receive a tax payment of $900 from the city on the earnings of the municipal bus lines from July 1, 1920, to June 30, 1924. Payment will be made under protest by the city.

In response to announcement of the local Internal Revenue Department at San Francisco that it will demand a 13½ per cent tax on profits of the San Francisco Municipal Railway, the dispatch from Washington announced:

The Treasury Department has turned down cold the suggestion from Collector of Internal Revenue McLaughlin of San Francisco that the income from San Francisco's municipally-owned utilities be taxed under the income-tax law.

The *Chronicle* quoted a high official of the bureau as saying:

We will have to go over the dead body and the decisions of John Marshall, who held more than 100 years ago, while handing down his decision as Chief Justice of the United States, upon which our government today is largely founded, that the federal government has no authority to tax the states nor the municipalities and that they, likewise, have no authority to tax the federal government.

That the Internal Revenue Department in Washington has been mystified with queries relative to what the government intends to do relative to municipally-owned properties taxation, further was vouchsafed in the dispatch from Washington, which continued:

Chiefs of the Bureau of Internal Revenue have been very much mystified by a flood of queries in the last few days on what the bureau proposed to do regarding the assessment of a tax against the income from the San Francisco Municipal Railway, the Hetch Hetchy power plant and the Embarcadero bus line.

No such policy has been established for the country at large and yet the bureau was informed that Collector McLaughlin was taking steps to assess such a tax. The bureau, fearing that its San Francisco agents were about to commit a grievous error that would react adversely, immediately wired Collector McLaughlin for information.

The collector's answer was received today and merely said they were still considering the matter and were waiting for authority from the bureau in Washington before proceeding. It was intimated very strongly today that this authority will not be forthcoming.

That the matter of taxing San Francisco's municipally-owned utilities originally was brought up by McLaughlin, the dispatch from Washington said further:

The matter was brought up originally by McLaughlin, who inquired of the bureau whether he should tax the income from these utilities. Never having heard of any such suggestion before and, desiring to ascertain further information in the matter, the bureau asked McLaughlin to send copies of the contract between the city of San Francisco and the Pacific Gas & Electric Company for the sale of power for examination by its lawyers. Other documents were asked for, none of which have yet been received.

Mr. McLaughlin said that in connection with the proposed collection of a tax of 13½ per cent upon the municipally owned public utilities of San Francisco the collection of taxes on the bus lines is a matter of court record, and that the taxes shortly will be forthcoming.

The Washington dispatch, announcing the government does not intend to attempt to collect taxes on municipally-owned properties in San Francisco, in conclusion, said:

The bureau chiefs made it plain that the idea (tax collection on municipally-owned properties in San Francisco) did not originate anywhere in the Treasury Department in Washington, but came out of San Francisco and that they were merely giving the matter routine consideration and had no idea of ever giving it their approval.

Mr. McLaughlin had announced that the government's move in this city to collect taxes on municipally-owned utilities was the preliminary act in a nation-wide campaign to collect income taxes on such properties, the total of which would run into staggering sums.

Sale of Detroit United Unit Avoided

Public sale of the Detroit-Monroe-Toledo unit of the Detroit United Railway, Detroit, Mich., has been averted by bondholders who paid the state $100,000 on account of back taxes. The line was to be sold at auction on Nov. 25. Back taxes total $739,000. Bondholders are expected to petition the state administrative board to withdraw the penalty charges, leaving a net tax due of about $500,000.

Plea for North Shore Equipment Trusts Heard

A recent application of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., for an order authorizing the issuance of $804,000 of new equipment trust certificates was heard by the Illinois Commerce Commission in Chicago on Nov. 22.

$5,000,000 Illinois Power & Light Issue Offered

An additional issue of $5,000,000 first and refunding mortgage bonds, series C, 5 per cent, 30 years, of the Illinois Power & Light Corporation, Chicago, Ill., is being offered by Harris, Forbes & Company, Halsey, Stuart & Company, Inc., Marshall Field, Glore, Ward & Company, E. H. Rollins & Sons, and Spencer Trask & Company. They are priced at 98, yielding more than 5.13 per cent. The Illinois Power & Light Corporation owns and operates electric power and light, gas, heat and city railway properties in a large number of municipalities in Illinois.

Utility Operator Takes Option on 300-Mile Steam Road

The Texarkana *Gazette* says that the Louisiana & Arkansas Railroad has been sold to H. C. Couch and associates. The price was reported to be $10,000,000, of which $500,000 has been placed in escrow with Charles S. McGain, president of the Park National Bank, New York, the balance to be paid Jan. 15.

Mr. Couch is president of the Arkansas Power & Light Company, Little Rock, Ark., controlled by the Electric Power & Light Corporation. He has long been prominent in the utility field. There has been no intimation about the ultimate disposition of the railroad soon to be acquired, but it has been indicated that plans ahead point to the ultimate electrification of at least part of this 302-mile road.

Three Merger Plans in Washington

B. McK. Bachman, chief accountant of the Public Utilities Commission of the District of Columbia, has presented a plan for consolidating the street railways of the District. According to Major W. E. R. Covell, who as acting Engineer Commissioner is also serving as a member of the commission. the Bachman plan is expected to be of material assistance to the commission in working out a merger plan to be presented to Congress. It is the only one of the three thus far projected that is before the commission in complete detail. The scheme drafted by Harley P. Wilson has been before the commission officially since Oct. 31, but it is not in complete form, and the author does not desire the commission to discuss it at public hearings until his final plan is submitted.

The third merger plan, worked out by the firm of Charles Hansel, consulting engineers and utility specialists, for the public utilities committee of the Federation of Citizens' Associations, is now being printed and put in form for publication. The Hansel plan is contained in a document of 125 closely typewritten pages and more than 100 maps, charts and plats. It is based on a comprehensive transportation survey made

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by the firm's engineers, and is said to be patterned after the so-called Mitten plan, now applied to the city systems under the direction of Mitten Management, Inc.

Business Slump Hurts Youngstown Receipts

Traction Commissioner Engle has reported for the third consecutive month an actual loss in the operation of the lines of the Youngstown Municipal Railway Company, Youngstown, Ohio. The company, in September, failed by $11,009 to pay expenses, the report shows. The actual losses in July and August were $2,786 and $1,990. The company should have earned $26,738 on a 7 per cent basis in September.

Revenues slumped in September to $114,355, a $20,000 drop from the $164,958 revenue in September, 1926. While the earnings dropped, the mileage decreased about 5,000 miles, from 468,345 in September, 1926, to 463,546 in 1927.

In other months this year, with falling incomes, the mileage has been increased over the same months in 1926. Earnings for September fell off $6,000 from those in August and $9,000 from the July revenue. Mr. Engle attributes the lowered earnings to the general slump in business.

Seeks Right to Purchase Short California Line

Permission to buy control of the Petaluma & Santa Rosa Railroad, Petaluma, California, was sought from the Interstate Commerce Commission on Nov. 30 by the Southern Pacific and Santa Fe Railroads, acting jointly. The Petaluma company owns 40 miles of line and operates steamboats into San Francisco. The purchasing corporations have a contract to pay $90 a share for two-thirds of the outstanding stock of the Petaluma company.

San Antonio Preferred on Special Terms

An opportunity to purchase the preferred stock of the San Antonio Public Service Company, San Antonio, Tex., has been offered to the employees up until Dec. 15. The stock will sell at $100 a share, with payments to be made $5 a share when stock is purchased and $5 a share each month thereafter until the stock is entirely paid for. Not more than ten shares will be sold to any one person.

In the *Broadcaster*, the official publication of the company, W. B. Tuttle, president, said that he would recommend all employees who can do so to make arrangements to purchase at least one share. The company has been offering its preferred stock for local sales for a number of years, and more than $4,000,000 has been invested by people in San Antonio and the vicinity.

Receivership Lifted in St. Louis

Property there passed on Dec. 1 to representatives of bondholders following foreclosure

"ROLLA WELLS, receiver," ceased to function at midnight Nov. 30, as the United Railways' properties in St. Louis and St. Louis County, Mo., passed to the St. Louis Public Service Company at that time and the new owners are now in possession of the system. Rolla Wells, receiver, had been in charge of the lines since April 12, 1919.

United States District Judge Faris on Nov. 26 issued an order for delivering three of the United Railways subsidiaries to the St. Louis Public Service Company for operation at the end of November. Receiver Wells in accepting the order told the court he would turn over the entire system at the same time. A court order to that effect was prepared.

J. K. Newman, New York, head of Newman, Saunders & Company, and Frank O. Watts, president of the First National Bank in St. Louis, directed the reorganization of the United Railways properties.

A. L. Shapleigh, president of the United Railways, is to head the new company; Stanley Clarke, general counsel of the reorganization committee, will be executive vice-president and Sam W. Greenland will be in charge of operations.

The properties ordered turned over to the new company include the Missouri Electric Railroad, Florissant Construction, Real Estate & Investment Company and the Merchants Express Company, which operates lines between Wellston and St. Charles, Mo., and to other points in St. Louis County.

In his order Judge Faris pointed out that "there is no longer any necessity for continuation of the receivership." He conditioned the surrender of the railway properties upon the St. Louis Public Service Company agreeing to pay all debts, obligations and other liabilities incurred during the receivership.

Receiver Wells was also directed by the court to submit speedily a final report of his receivership so that the receivership can be legally terminated and the receiver discharged.

To facilitate the transfer of the system to the new owners the St. Louis Public Service Company asked the Public Service Commission that the existing fare schedule of the United Railways be filed in its name as of Dec. 1. The other application, by E. P. Walsh, president of the Missouri Electric Railroad, was for the filing in the name of that company the present fare rate schedule of the United Railways for the line between Wellston and St. Charles as of Dec. 1. No change in the fares was asked in either application.

With the receivership of the United Railways officially ended the St. Louis Board of Estimate and Apportionment is expected to give immediate attention to the adjustment of the city's $3,500,000 mill tax claim against the railway.

The city has the alternative of accepting either one-third in cash or two-thirds in the preferred stock of the new company. The city has until Dec. 15 to decide which settlement to accept. However, under its new charter it is prohibited from holding stock in private corporations.

The mill tax originally assessed against the railways was $2,396,321, but with interest the amount now is $3,500,000. The railway system was thrown into receivership shortly after the United States Supreme Court had upheld the legality of the mill tax.

Judge Faris of the United States District Court had classed the city as a general unsecured creditor. City officials have been fighting for full payment of the mill tax with interest to date.

Approximately 749,000,000 Passengers Carried in Canada

Electric railways of Canada carried 748,710,836 passengers in 1926, and the gross revenues were the largest in their history, but the majority of them failed to pay dividends. The net result of the operation of all electric railways was a deficit of $285,260, and two Ontario street railways, in Thomas and Peterboro, ceased operations.

Although the net income available for dividends and reserves amounted to $8,401,896, which was $1,678,017 more than in 1925, the total deductions were increased by $668,758, so that the net result of the operation of all railways was a deficit of $285,260, compared with a deficit of $1,294,519 in 1925.

During the year $2,647,010 was paid in dividends by six railways and $6,040,147 was charged to reserves and special charges by 45 of the railways. Of the 61 railways operated, 24 railways, after paying all charges, including dividends, showed surpluses aggregating $1,540,368 and the other 37 railways showed deficits amounting to $1,565,626.

The Montreal Tramways carried 207,754,983 passengers and the Toronto Street Railway 183,494,076 passengers. The British Columbia Electric Railway, which operates more mileage than either Toronto or Montreal, carried 74,018,102 passengers, while the Winnipeg Electric carried 57,985,144. The Hamilton Street Railway had 50,113,622 passengers and the Ottawa Railway 35,753,611. Fare passengers carried by the Montreal Tramways increased by 6,251,745, or 3.1 per cent, and the Toronto Transportation Commission's traffic increased by 2,714,136 fare passengers. The township of York and town of Weston, which handles urban traffic in the suburbs of Toronto, showed an increase of 3,059,044 fare passengers. The Winnipeg Electric showed an increase of 2,889,086 passengers, the Sandwich, Windsor and Amherstburg an increase of 2,138,548 passengers and

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the Ottawa Electric an increase of 1,386,949 passengers.

With a few exceptions the interurban lines showed a reduced traffic and those which showed an increase handled a larger urban traffic, such as the British Columbia Electric, which showed an increase of 2,922,177 passengers. The Montreal & Southern Counties and Nipissing Central had heavier traffic than in 1925, but the Niagara, St. Catharines & Toronto reported a reduction of 1,069,824 passengers, the Windsor, Essex & Lake Shore a reduction of 105,437 passengers, and other interurban roads smaller reductions.

Would Permit Profit on Boston Reorganized Road

The Massachusetts Department of Public Utilities has authorized the Boston, Worcester & New York Street Railway to issue $2,066,000 of capital stock and $1,008,000 of bonds, in connection with the financial reorganization of the company. This is the successor company to the Boston & Worcester Street Railway, sold at receivership to a group of bondholders headed by Henry B. Rising, Boston. The sale price was $360,000.

In its order of approval the commission makes the following significant observation:

To permit the company to make a profit, if it is able to do it, based upon the proposed capitalization, will in no way impose an unfair burden upon the public, as the public will obtain the use of the property by paying a return on the value which is not in excess of the cost of replacing it and which is approximately $2,000,000 less than the amount originally invested therein.

We think it in the interest of the public that the property should be maintained and operated, if possible, and it is but justice to the bondholders that they be given an opportunity to recover, so long as no injustice is done to the public, the value of that which they advanced to the old company.

While there may be some possibility that some one of the public may be induced to give undue weight to the approval of this department of the capitalization in the purchase of the company's securities, we are of the opinion that under the circumstances that ought not to stand in the way of affecting the reorganization proposed.

We are not impressed with the argument that the sale price at the receiver's sale indicates the value of the property for street railway purposes. No one was in a position to bid very effectively at such a sale in competition with the reorganization committee, as it represented virtually all the bondholders who had assented to the reorganization plan, and the only effect of an increased price at the receiver's sale would have been to increase the amount of money which would be available to non-assenting bondholders who held less than 150 bonds.

The main purpose of the sale was to acquire title and to provide sufficient funds to meet the receiver's obligations. Reference was made to the sale in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 12, page 920.

$78,504 Net Profit in Mexico City

Operation of the Mexico Tramway, Mexico City, Mexico, for the year ended Dec. 31, 1926, shows a net profit of $78,504 after deductions for tax payments and depreciation. This represents an increase of $608,759 over the results obtained during the previous year, in which a heavy loss was sustained owing to a strike that took place on the property during the first two weeks in March.

In the report of President G. R. G. Conway, recently issued, it is said that the unfavorable situation in connection with the jitney continued during the year, with some slight modifications in the jitney routes and the establishment of some crosstown lines. The number of jitneys in service, however, has declined from about 2,200 in 1924 to 1,400 at the end of 1926.

During the year there was an improvement in traffic conditions and an attempt was made by the traffic department of the Federal District toward controlling and regulating the traffic in a more satisfactory manner than had been the case in previous years. The company, with a view to meeting competition, decided to make a number of changes in the routing of the cars, to put into effect a reduced fare, to enlarge the "city" zone and to suppress on certain routes the second class service. Among the proposals for meeting the jitney competition was a scheme for selling weekly tickets for $2.50 (pesos) allowing unlimited riding throughout the enlarged city zone.

During the year 35 interurban and fourteen city cars were equipped with safety doors and steps at both ends; 36 city cars were equipped with safety doors and steps on the rear end.

In Mexican currency $1,511,388 was expended during the year for repairs and maintenance. In the same period a total of $862,293 was spent on track, overhead lines and buildings. During the year $453,901 Mexican currency was spent upon new completed and uncompleted construction work and upon reconstruction work, properly chargeable to capital account.

The accompanying table shows gross earnings, operating expenses and miscellaneous information for the year ending Dec. 31, 1926, compared with the year 1925. The thirteenth annual report includes both the statement of the board of directors and the report of the president.

STATEMENT OF OPERATIONS, MEXICO TRAMWAYS

	1926 (Mexican	1925 Currency)
Car Earnings:		
Passengers	$7,483,549	$7,635,801
Monthly tickets	1,586,366	1,415,932
Chartered cars	39,378	49,251
Freight	371,576	339,050
Baggage and parcels	110,495	107,628
Funeral	182,887	211,723
Omnibus	.....	78,081
Total	$9,774,253	$9,837,468
Miscellaneous earnings	157,026	159,564
Total earnings	$9,931,280	$9,997,033
Expenses:		
Operation	$6,506,747	$6,482,819
Maintenance, taxes and depreciation	3,346,029	4,044,469
Total expenses	9,852,776	10,527,288
Net earnings from operations in Mexico	$78,504	*$530,255
Passengers carried:		
1st class	63,844,517	62,947,208
2nd class	23,090,106	22,561,126
Omnibuses	.....	510,805
	86,934,623	86,019,139
Total car mileage	18,568,009	18,090,841
Average number of passenger cars operated per day:		
Electric	389.73	379.59
Gasoline and mule cars	4.15	3.90
Omnibuses	.....	3.98
Total	393.88	387.47
Average earnings per passenger car per day	$63.86	$65.32
Average receipts per passenger car mile	.5117	.5283
Operating expenses, excluding taxes and depreciation, per car mile, passenger services	.4758	.5046
Operating expenses, including taxes and depreciation, per car mile, passenger services	.5237	.5755
Daily average earnings from operation	$27,208	$27,389
Percentage of gross expenditures, excluding taxes and depreciation, to gross earnings	89.82	92.11
Percentage of gross expenditures, including taxes and depreciation, to gross earnings	99.21	105.30

*Deficit.

Foreclosure Sought at Port Arthur

Foreclosure of a mortgage and sale of the property of the Port Arthur Traction Company, Port Arthur, Tex., is requested in a petition filed by the Dayton Savings & Trust Company of Dayton, Ohio, trustee under the terms of the indenture executed to secure the railway's first mortgage 5 per cent bonds, outstanding to the amount of $293,000. Interest on the outstanding bonds is said to be in default since July, 1926.

Portion of Seneca Falls Line Abandoned

The Public Service Commission recently granted the petitions of the Geneva, Seneca Falls & Auburn Railroad, Inc., and its receivers, Hoskins & Ryan, and approved the declaration of abandonment of a portion of its line in Seneca Falls.

It was shown by evidence at hearings and conferences that the road was operating at a loss, that foreclosure proceedings had been instituted against the company and that the abandonment of a portion of the line was proposed in the hope that savings could be made to insure partial operation.

Commissioner Brewster said that if the railroad were making a profit on the entire system, it could be held to a continuance of this line. But this was not the case and the company was faced with the determination of what was best for the public which is served by the entire road.

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Legal Notes

FEDERAL SUPREME COURT — *Care Required by Truck Driver at Obscured Railroad Grade Crossing.*

The driver of a motor truck was hit by a locomotive at obscured grade crossing. He had been driving at the rate of 10 or 12 m.p.h., but had cut down his rate to 5 or 6 m.p.h. at about 40 ft. from the crossing. A good view of the track was obscured by a section house. It was daylight and the driver was familiar with the crossing. The court held: "It appears to us plain that nothing is suggested by the evidence to relieve Goodman from responsibility of his own death. When a man goes upon a railroad track he knows that he goes to a place where he will be killed if a train comes upon him before he is clear of the track. He knows that he must stop for the train, not the train stop for him. In such circumstances it seems to us that if a driver cannot be sure otherwise whether a train is dangerously near, he must stop and get out of his vehicle, though obviously he will not often be required to do more than to stop and look. It seems to us that if he relies upon not hearing the train or any signal and takes no further precaution, he does so at his own risk. If, at the last moment Goodman found himself in an emergency, it was his own fault that he did not reduce his speed earlier or come to a stop. It is true * * * that the question of due care very generally is left to the jury. But we are dealing with a standard of conduct, and when the standard is clear it should be laid down once for all by the courts. [Baltimore & Ohio R.R. vs. Goodman, 48 S. Ct., 24.]

DELAWARE — *Failure of Railroad Crossing Signal Not Necessarily Negligence.*

"While a railroad company is under no original obligation to place a signal bell, gong, or blinker light at a public crossing, yet if it has done so and has maintained the same for a long time, travelers over such crossings have a right to presume, if upon approaching said crossing the bell or gong is not ringing or the light shining, that they may pass over the crossing safely, if in the exercise of due care and caution nothing appears to the contrary. But the failure of the company to ring a signal bell at the crossing or to have the blinker lights shining or to give other due and proper warning of an approaching train would not excuse the deceased, when approaching the crossing and before going over the track, from exercising reasonable care and caution, such as an ordinarily prudent and careful man would exercise under similar circumstances." [MacRobert vs. Baltimore & Ohio Railroad, 138 At., 904.]

MISSOURI — *The Status of Person Transferring From One Car to Another.*

Street railway tracks had not been completed across a highway viaduct, and passengers were accustomed to ride as far as they could on one side, to receive a transfer, walk across the viaduct and take a car on the other side. The status of a person injured while so crossing the viaduct was held for the jury. The mere possession by him of a transfer did not necessarily make him a "passenger." [Watts vs. Fleming et al., 298 S.W., 107.]

NEW YORK — *Questions Pertinent to Be Asked by Public Service Commission.*

Under the Public Service Commission Law a witness cannot be required to answer questions unless they are material and pertinent to the purpose of the investigation being conducted. The burden of proving materiality and pertinency is on the commission. It is not sufficient that the Commission or its council deem the questions to be pertinent and legal. Questions asked of a witness as to prices paid by him for the stock of a transit corporation are irrelevant and immaterial, but questions as to the amount of stock in one transit corporation held by a competing transit corporation of which the witness was an officer and within 90 days before the investigation, were material and pertinent. A man's character and integrity are not proper subjects for investigation by an administrative body of the transit commission. [In re Dahl, 224 N.Y. Sup., 210.]

OHIO—*Conditions Under Which Supreme Court Will Reverse Commission.*

The Public Utilities Commission granted a certificate of convenience and necessity to an individual to operate a bus line without pick-up service between Steubenville and Bridgeport. The case was appealed to the Supreme Court by an existing bus line, a steam railroad and an electric railway company. The court said that it would not substitute its judgment for that of the commission as the order was not against the manifest weight of the evidence, which it did not find to be the case in this suit. [Ohio Valley Transit Co. et al. vs. Public Utilities Commission, 158 N.E., 182. (See also very similar case, Lykins vs. Public Utilities Commission, 158 N.E., 171.)]

OKLAHOMA — *Statute for Regulating the Use of Public Highways by Motor Carriers for Hire Held Valid Exercise of Public Power.*

Chapter 113 of the state laws is based on the theory that the individual citizen has no right to use the highways of the State for private enterprise to the detriment of the general public, and that where individual interest conflicts with public interest, as must be the necessary result in the use of public highways for private purposes without regulation, the government is never impotent to protect the public welfare. A private motor carrier, operating over the public highways of the state, though without regular or fixed time schedules, between fixed points in the transportation of commodities for hire under separate contracts with several business concerns, is a "motor carrier" within the meaning of the law. Hence it is subject to control and regulation by the provisions of the law. The case is differentiated from Frost vs. California Railroad Commission, as decided by the United States Supreme Court. [Barbour vs. Walker, 259 P., 552.]

PENNSYLVANIA — *Railway Not Responsible When Sharp Heel of Woman Passenger Is Caught in Groove of Curved Rail.*

A woman passenger after alighting from a car caught the sharp heel of one of her shoes in the groove of a curved rail. The groove was of the customary size, i.e., 1⅛ in. wide and 1¼ inches deep. The plaintiff had not asked to be assisted while alighting. The railway was held not responsible. [Low vs. Harrisburgh Rys., 138 At., 852.]

TEXAS—*Duty of Motorman to Automobile Stalled on Track.*

To make a railway company responsible where a motorman ran into an automobile stalled on the track, "it must appear that the driver of the street car actually saw the automobile on the track, and knew and realized the danger to its occupants in time to have, by the use of the means at hand, consistent with the safety of the street car, avoided the collision, and then failed to do so. If he had no such knowledge, the doctrine [of discovered peril] did not apply, although it appeared that by the exercise of ordinary care he might have acquired same." [Eastern Texas E. Co. vs. Smith, 298 S.W., 314.]

WASHINGTON—*Right-of-Way at Crossing Defined.*

Under the state law, street cars have a right-of-way at street intersections over other vehicles simultaneously approaching such intersections. Such right-of-way, however, must be exercised with care and with due regard to the use of the street by others. [Lung vs. Washington W. P. Co., 258 P., 832.]

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Personal Items

G. H. Conklin Heads Carolinas Bureau

George H. Conklin, whose election as secretary and treasurer of the North and South Carolina Utilities Information Bureau was announced in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 26, has been affiliated with the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., since 1891. From a college in Kansas he went to Augusta as secretary to the then president, Col. D. B. Dyer, who built and operated the road, with Jarvis and Conklin as partners, until they sold it in 1902. Mr. Conklin has served in nearly every department incident to the business and has been in charge of the claims department for the entire 36 years. During this time he has served with a half dozen ownerships and fifteen different managers. For the past eight years Mr. Conklin has been devoting his time and attention especially to publicity and safety, having helped to organize the safety organization.

His present title is director of public relations. As secretary and treasurer of the North and South Carolina Utilities Information Committee, to which position he was elected at the recent meeting in Charlotte, he succeeds Raymond Hunt, vice-president of the Tidewater Light & Power Company at Wilmington.

Mr. Conklin is a member of the Georgia Manufacturers Association, the Utilities Information Committee of Georgia and the Board of Commerce.

New Resident Vice-President of Pennsylvania in New York

George Le Boutillier, vice-president of the Long Island Railroad, was elected on Nov. 23 to the newly created position of resident vice-president of the Pennsylvania Railroad in New York City. This step has been taken in order that the Pennsylvania Railroad may be more adequately represented in the largest city of the country by an officer of executive rank. Mr. Le Boutillier, in his new capacity, will be in a position to deal with the questions arising at New York authoritatively as a Pennsylvania Railroad senior representative in New York City. He will also continue to serve as vice-president of the Long Island Railroad, but will, however, be largely relieved of operating details by reason of the recent appointment of R. K. Rochester to the position of general manager of the Long Island Railroad. Heretofore Mr. Rochester was assistant general manager of the Pennsylvania Railroad, stationed in New York City. As general manager of the Long Island he will personally direct its operations.

The board of directors also transferred William U. Moyer, assistant to the president and now stationed at Philadelphia, to New York City.

Mr. Le Boutillier has been in the service of the Pennsylvania Railroad for 32 years. In 1920 he was appointed general superintendent of the Eastern Pennsylvania Division, with headquarters at Harrisburg, Pa., and in 1923 was transferred to the Long Island Railroad as vice-president.

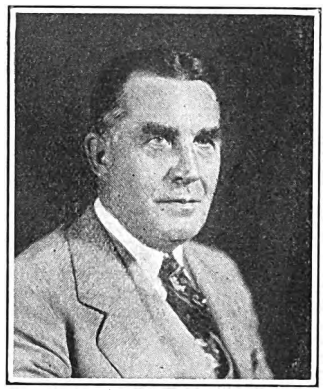
J. F. ORR, sales manager of the Idaho Power Company, has become manager of the Ogden division of the Utah Light & Power Company at Ogden, Utah. He had been engaged continuously in one field of service eighteen years.

T. F. DREW has resigned as president of the Middlesex & Boston Street Railway, Newtonville, Mass., and H. H. Hanson was elected in his place. J. L. Richards resigned as chairman and Mr. Drew was made chairman.

Friends Honor W. H. Sawyer

New president of Stevens & Wood welcomed back to New York at testimonial dinner on Nov. 28

W. H. SAWYER, recently elected president of Stevens & Wood, Inc., New York, was the guest of honor at a testimonial dinner at the Engineers Club, New York, on Nov. 28, arranged by a group of his friends in the railway and utility business so as to welcome "Bill," as he is best known among them, back as a resident of New York. The guests included men high in the councils of the utility business, whose contact and friendship with the new Stevens & Wood executive date back many years.



W. H. Sawyer

Little time was spent in dwelling upon Mr. Sawyer's ability as an engineer and an executive. His business record was so well known to those who attended the dinner that speakers confined their remarks largely to their impressions of their guest as a man and a friend. These testimonials threw into relief the many sterling qualities which have won for Mr. Sawyer a country-wide reputation for straightforward dealing, honesty of purpose and unflinching courage, tempered with tolerance and broadminded acceptance of an opposing point of view.

J. N. Shannahan, past-president of the American Electric Railway Association, acted as toastmaster. He said that it seemed eminently fit that a dinner to Bill Sawyer should be confined to a small group of personal friends, because loyalty to his friends has always been one of the outstanding characteristics of the guest of honor. Other speakers included Charles Gordon, speaking for James H. McGraw; F. R. Coates, Frank Hedley, R. P. Stevens, L. S. Storrs, T. A. Kenny and Mr. Sawyer.

Several speakers characterized Mr. Sawyer's service to the industry during the past year as president of the American Electric Railway Association as an outstanding achievement, since he had devoted himself unstintingly to the task of arousing local transportation men to an adequate appreciation of present-day public demand by preaching the gospel of a new day, of new conditions and of new demands upon the industry. The result of that work was evidenced by the Cleveland convention, with its dramatic revival of spirit and enthusiasm among manufacturers and operating executives.

ACTIVE EXECUTIVE WITH BROAD TRAINING

In commenting on Mr. Sawyer's accession to the post of president of the Stevens & Wood organization, R. P. Stevens, now chairman of the board, said that the move was dictated by the expansion of the firm's business and the need for an active executive of broad training, foresight, courage and winning personality.

After he was graduated from the University of Nebraska Mr. Sawyer had nine years of diversified experience with the General Electric Company. He then became engineer in charge of the New York office of Ford, Bacon & Davis, where he served for another nine years.

In 1914 the E. W. Clark & Company Management Corporation elected him to the position of vice-president, in which post he broadened his experience in utility management, engineering and construction. Then as president of the East St. Louis & Suburban Railway and affiliated properties for the North American Company Mr. Sawyer established a country-wide reputation for progressiveness in the face of difficult circumstances.

A great compliment was paid to his business and engineering ability when

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in 1925 Mr. Sawyer was retained by the Victorian Government of Australia and appointed a Royal Commissioner to inquire into and report upon the status and affairs of the Electricity Commission of Victoria, and especially as to its power generation and distribution. He obtained a leave of absence from the North American Company to undertake this work, which was accomplished with great success.

John W. Hancock Heads Virginia Association

John W. Hancock, general manager of the Appalachian Electric Power Company, Charleston, W. Va., was elected president of the Public Utilities Association of Virginia at the recent annual convention. In this capacity he succeeds William E. Wood, Richmond, president of the Virginia Electric & Power Company.

For many years Mr. Hancock has been affiliated with the Roanoke Railway & Electric Company, which is controlled by the Appalachian Electric Power Company. In 1913 his duties were extended to include the property of the Lynchburg Traction & Light Company, Lynchburg, Va. He entered the service of the Roanoke Street Railway in 1895 and was appointed general manager when the company was reorganized early in 1900.

Mr. Hancock was born in Franklin County, Virginia, and has lived in Roanoke since 1890. Once before, in 1913, he served as president of the Public Service Association of Virginia. He is a member of the American Institute of Electrical Engineers.

Personnel Changes on Northern States Property

George H. Wilmarth, division manager of the Northern States Power Company, Eau Claire, Wis., has been appointed chief operating engineer with headquarters at Minneapolis. Mr. Wilmarth removed from Oklahoma to Wisconsin in 1923, when the Byllesby interests, with which he had been connected since 1910, acquired the Wisconsin-Minnesota Light & Power Company. He was formerly manager of the Oklahoma Gas & Electric Company at Sapulpa and in 1918 became manager of the Muskogee division. This position he occupied until 1923, when he was made vice-president and general manager of the Wisconsin-Minnesota Light & Power Company. Mr. Wilmarth succeeds M. L. Hibbard, who has resigned to accept a similar position with another company.

Harold L. Geisse succeeds Mr. Wilmarth. In addition to his duties as manager of the Wisconsin division, he will continue as general manager of the Wisconsin Valley Electric Company and affiliated companies with headquarters at Warsaw. This position he has occupied since 1921.

E. L. Graumlich Commissioner at Toledo

Has been acting street railway commissioner in Ohio city for three years. Graduate engineer

E. L. GRAUMLICH, acting street railway commissioner at Toledo, Ohio, for more than three years, was permanently appointed commissioner by Mayor F. J. Mery on recommendation of the Board of Street Railway Control during the week ended Nov. 26. The Mayor stated that Mr. Graumlich had served "loyally and well and deserved the appointment."

Mr. Graumlich went to Toledo as engineering assistant to Commissioner Wilfred E. Cann early in February, 1921, when the present Milner service-at-cost ordinance went into effect. After Mr. Cann resigned as commissioner he

E. L. Graumlich

continued to fill the vacancy and work with the board of control through the last three years.

He was graduated from Fostoria high school and took his engineering training at Case School of Applied Science, Cleveland, from which he was graduated with the class of 1918. Immediately thereafter he entered the World War service as an officer in the Coast Artillery. Previous to his graduation Mr. Graumlich worked with Fielder Sanders, then street railway commissioner in Cleveland, and it was on the basis of this experience that he was brought to Toledo.

Engaged on Several Surveys

Mr. Graumlich also did considerable work in rapid transit surveys in Cleveland and Detroit under the direction of Parsons, Klapp, Brinckerhoff & Douglas, New York. Since he has been in Toledo he has been consulted by many railway engineers from various cities anxious to study electric railway practices in Toledo.

The appointment was considered timely, particularly since there is the possibility of a change in the commissioner's office due to the progress made in the last year of negotiations toward a new railway franchise ordinance. Mr. Graumlich has been the technical adviser of the City Council and Street Railway Board of Control in all these matters. There will probably be no change in complexion of the board, at least, until February, 1929. This promises to keep intact the administration of the board and its staff through negotiations now in progress.

OBITUARY

Charles B. Manville

Charles B. Manville, 92 years old, founder of the Johns-Manville Company, died at his home in Pleasantville, N. Y., on Nov. 27. He had been ill only a few days.

When Mr. Manville retired from the Johns-Manville Company many years ago, the late Thomas Franklyn Manville, his son, became president, and upon his death the reins were taken over by another son, H. Edward Manville, who was in control until last May, when he resigned the presidency to become chairman of the board of directors of the company.

Born in Watertown, N. Y., Dec. 16, 1834, Mr. Manville emigrated to the West in one of the many pioneer waves prevalent in the '40s. He stopped in Wisconsin and there found deposits of asbestos which he developed into insulation and roofing materials and thereby laid the foundation for the company which still bears his name. He and his sons virtually acquired a monopoly on the asbestos field when they gained control of the mines in Ontario, the chief source of the mineral.

William Carpender, formerly president of the Sixth Avenue Railway, New York, N. Y., died in that city on Nov. 26. He was a financial figure in Manhattan for many years. In 1918 he was elected president of the Sixth Avenue Railway, which later became part of the New York Railways. In this capacity he succeeded the late Frank Curtiss. Mr. Carpender was 84 years old.

William P. Bonbright, founder and for many years president of the banking house of Bonbright & Company, died Nov. 10 in Roosevelt Hospital, New York. A native of Philadelphia, Mr. Bonbright entered upon his career with Hood, Bonbright & Company of that city in 1876, six years later being admitted to partnership. It was in 1920 that he retired from the presidency of Bonbright & Company, New York. This company under the leadership of Mr. Bonbright rapidly forged to the front of investment banking firms and was a pioneer in light and power securities. It has co-operated closely with the electrical industry during its development and has made notable contributions to its progress through the Bonbright survey and the Bonbright prize awards. Mr. Bonbright had many friends among utility executives and has always been an enthusiastic advocate of the utility industry. He was 68 years of age.

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Manufactures and the Markets

Three Car Orders Contained in Recent Reports

Twenty-four new cars intended for two Canadian companies. New York company orders twenty subway cars

NEW car orders by the Toronto Transportation Commission and the Quebec Railway, Light & Power Company for fourteen and ten cars respectively are mentioned in recent reports. An order for twenty subway units has already been placed by the Hudson & Manhattan Railroad.

Eight combination passenger smoking and baggage compartment cars and six straight passenger cars with smoking compartments for the Toronto Transportation Commission are to be used in interurban service out of Toronto. While the cars are designed for single-end operation provision is made for operating them from the rear end in an emergency Passengers will enter and leave through the rear door only The smoking compartment will be ahead of the passenger section. Cars will be trimmed in African mahogany and genuine leather-upholstered seats, which are semi-divided, will be used. Between certain of the seats a card table can be placed for use of passengers on long trips.

The Quebec Railway, Light & Power Company, Quebec, Canada, intends purchasing ten double-truck, one-man, two-man cars for delivery next May. The cars will be 41 ft. long and will have a seating capacity of 45 passengers. In general design they will be similar to those now operated by the Montreal Tramways, Montreal, Canada.

An order for twenty subway units was placed last week by the Hudson & Manhattan Railroad, New York, with the American Car & Foundry Company.

Second International Coal Conference Will Be Held

From the Carnegie Institute of Technology in Pittsburgh comes an official announcement that a second International Conference on Bituminous Coal will be held there during the week of Nov. 19, 1928.

Gary Railways Receives Last of Sixteen Remodeled Cars

The last of the sixteen side-entrance cars formerly used on Broadway have been received by the Gary Railways, Gary, Ind., from the Cummings Car & Coach Company, Paris, Ill., where they have been remodeled into front-entrance cars with automatic doors, conforming to the type now being used generally over the lines of the company. Workmen have begun the final half of the reconstruction work on the company's North Broadway loop, where concrete pavement is being laid between the tracks; the first half of the $25,000 project was completed a short time ago, opening the northbound tracks for use. Completion of another improvement project, installation of a sprinkler system in the car shops, was also announced.

One of Georgia Power's New Units Run on Peachtree Street

One of the 40 new all-steel cars ordered by the Georgia Power Company, Atlanta, Ga., has recently been placed in service on the line running on Peachtree and Whitehall Streets. Seating plan, elevation and preliminary specifications were published in the JOURNAL Aug. 20. Most of the new cars have been delivered and the balance at that time were being received at the rate of one or two weekly, according to officials of the company.

New Locomotive Soon Ready for Indianapolis-Eastern Road

A new electric locomotive built at the Greenfield shops of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., was recently taken through Indianapolis to the paint shops of the company at Crawfordsville to receive the finishing touches. The engine, which will be brought to Indianapolis soon to be on exhibit for a day at the traction terminal station, is said to have ten times the tractive power of the average electric car and will be used exclusively for freight haulage.

V.E.P. to Start $85,000 Job Early in 1928

Street railway tracks of the Virginia Electric & Power Company on Granby Street, between Queen and Main Streets, Norfolk, Va., will be reconstructed early next year at a cost of about $85,000, officials of the public utility company disclosed. The company is obligated, it is understood, by franchise requirements to repave between its tracks and 2 ft. on either side of them. The city of Norfolk is said to be considering repaving the street at the same time the Virginia Electric & Power Company is doing its work. City officials admit that Granby Street paving is in bad condition, it is reported, but are worried about the large slice of the small bonding margin which the improvement would absorb.

The $5,000,000 addition to the Reeves Avenue power plant will be opened early in December, according to an announcement by Thomas P. Walker, vice-president at Norfolk.

W. H. Woodin Again Heads American Locomotive Company

William H. Woodin, head of the American Car & Foundry Company, and chairman of the American Locomotive Company board of directors, was for the second time in the space of two years elected to the presidency of the American Locomotive Company, at a recent meeting of the board of directors, to succeed the late Frederick F. Fitzpatrick. Mr. Woodin's various connections with the company are, elected a director in 1919, president in 1925, chairman of the board of directors in 1927. In 1926 he resigned the presidency in favor of the late Mr. Fitzpatrick.

Permit Issued at Coral Gables to Build Municipal Carhouse

Issuance of a building permit at Coral Gables, Fla., for the first unit of the municipal carhouse, to be constructed at 134-146 Muertes Avenue, took place recently. It is understood the structure will cost about $20,000.

Copper and Lead Prices Advance in Active Metal Market

Sales of practically all metals have been phenomenally good all month and prices of copper, tin, lead and zinc have advanced as a result. Copper has done particularly well, advancing ⅝ cent during the month. Lead and zinc dropped to new lows early in November, but have since more than made up the loss. Tin has been irregular, but is 1½ cents higher today than on Nov. 1.

Until Nov. 29, copper sellers generally adhered to the 13¾ cents level in the East and 13⅞ cents delivered in the Middle West, with some offerings and sales at 2½ to 5-point concessions in the East. Business Nov. 29 was so large, however, with two or three particularly heavy orders, that an overnight advance was general. On Nov. 30 sales had been made all the way between 13.80 cents delivered in the East to 14 cents in Detroit and other Mid-Western territory.

The foreign market has also been strong, and the price was advanced from 14.05 cents, c.i.f. to 14.15 cents Nov. 30.

The last week has been a quiet one for zinc, following a more active week than any other in a year or more. Prices have been well maintained at around 5.85 cents for December shipment, however, and somewhat higher for deliveries further forward. On Nov. 30 little interest by consumers was reported, but with the higher prices asked for concentrates in the Tri-State district smelters are holding firm. High-grade continues nominally at 7¾ cents delivered in the East for spot carloads. Prime Western in New York is at the customary freight differential of 35 cents per 100 lb. above St. Louis.

After maintaining its New York price for common lead at 6.25 cents per

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METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Nov. 29, 1927
Copper, electrolytic, cents per lb	13.525
Copper wire, cents per lb	15.50
Lead, cents per lb	6.41
Zinc, cents per lb	6.237
Tin, Straits, cents per lb	59.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.075
Somerset mine run, Boston, net tons	1.85
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.55
Central, Ill., screenings, Chicago, net tons	1.325
Kansas screenings, Kansas City, net tons	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	5.50
Weatherproof wire base, N.Y., cents per lb.	16.25
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.55

pound for eleven weeks—since Sept. 9, when the price was cut from 6.40 cents—the American Smelting & Refining Company on Monday, Nov. 28, advanced its official quotation $1 per ton to 6.30 cents, and the next morning made a further advance to 6.40 cents. Several good sales have been made at 6.45 cents on Nov. 29 and 30. The St. Louis market was even more active than that in the East, and the price was marked up during the week from 6.075 cents to 6.22½ cents. Corroding grades of lead are commanding the usual premium of from $2 to $3 per ton.

Backing and filling have characterized the tin market during the week. London on Nov. 29 ignored a decline in the New York market on the preceding day, and as a consequence the domestic prices stiffened again. Dealers have traded actively, but consumers likewise have been in the market. Prompt Straits is not overly plentiful, and it commands a premium, though very slight, over forward positions.

Rubber and the Trade Balance

Rubber continues to play an important part in determining whether the foreign trade balance of the United States shall tilt upward or downward. An analysis of international trade of the United States for the first six months of 1927, made by the Department of Foreign Commerce of the Chamber of Commerce of the United States, shows that while exports increased, as compared with the similar period of the previous year, imports declined.

Of the total decrease of $178,000,000 in import values $137,000,000 is accounted for in the heavy decline in crude rubber prices. While rubber was slipping, silk went into the ascendent, taking first place in the rank of imports. In its analysis the department said:

The average price of raw silk in the first half of 1927 was 65 cents a pound lower than in the same period of last year, and our imports reached the record total of 35,246,000 lb., valued at $193,385,000, a 25 per cent increase in quantity and an 11 per cent gain in value over last year's figures. The price of crude rubber declined 33 cents a pound and we imported nearly 500,000,000 lb., with a total value of $184,713,000, an 8 per cent gain in quantity, but a 43 per cent decrease in value.

ROLLING STOCK

TRI-CITY RAILWAY, Davenport, Ia., it is reported, has purchased at a cost of about $46,000 five Mack six-cylinder, 29-passenger motor coaches, which will be placed in service as soon as delivery on the order can be made. Two of the new coaches will take the place of the old coaches now operated on the 23d Avenue line in Moline and the three others are to be put into service on the Arsenal coach line, the new short cut to Moline from Davenport. It is probable that the Arsenal line will not be in operation until Jan. 1.

TRACK AND LINE

PHILADELPHIA RAPID TRANSIT COMPANY, it is reported, will install an electro-pneumatic interlocking plant for emergency operation at the Allegheny avenue station, on the Frankford elevated division. The interlocking machine will consist of eight working levers, four of which will be employed for traffic locking between adjacent towers and the others for operating the switch movements, electro-pneumatic train stops, light signals, etc., of the plant. All the interlocking apparatus is being furnished by the Union Switch & Signal Company, while the construction work will be carried out by the Philadelphia Rapid Transit Company's regular field forces.

SHOPS AND BUILDINGS

GRAYBAR ELECTRIC COMPANY, New York City, has leased a one-story brick warehouse and office building now in the course of erection in Memphis, Tenn. The new structure is located at Linden and Beale Avenues. Occupancy has been promised as of Jan. 15, 1928.

WHITE COMPANY, Cleveland, Ohio, announced a short time ago the addition of another new direct factory branch with the opening of a new building in Bronx Borough, New York City. The completed building is two stories and basement, of fireproof concrete and brick construction, and cost $250,000. It has 90,000 sq.ft. of floor space and is located on Cypress Avenue between East 132d and East 133d Streets. L. C. Watson is in charge of sales and G. F. Downing in charge of service at the Bronx branch.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD, New Haven, Conn., will have its substation at Devon, Conn., finished soon, recent reports indicated. The U. G. I. Construction Company, Philadelphia, Pa., has completed its work on the substation. The balance of the electrical equipment, it was reported, would be installed at once. The station was built to feed the trolley lines of the Connecticut Company and the electrified lines of the railroad.

TRADE NOTES

MORTON MANUFACTURING COMPANY, Chicago, Ill., has announced the appointment as of Nov. 1 of H. B. Wilson, 915 Olive Street, St. Louis, Mo., to be southwestern sales manager of the railroad division of the Morton Manufacturing Company. Mr. Wilson will supervise the sale of the complete "Morton line of railway appliances."

BALDWIN LOCOMOTIVE WORKS and STANDARD STEEL WORKS COMPANY announce the removal of their offices from Suite 1210 Boatmen's Bank Building to Suite 1520 Telephone Building, 1010 Pine Street, St. Louis.

CLEVELAND FROG & CROSSING COMPANY, Cleveland, Ohio, has announced the appointment Nov. 15 of Joseph A. Donahey, heretofore sales and service engineer, as manager of sales, to succeed George Stanton, deceased.

MORSE TWIST DRILL & MACHINE COMPANY, New Bedford, Mass., has announced the opening of a store at 92 Lafayette Street, New York City, where it has put in a complete stock of its products.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, manufacturer of "Linc-Weld" motors and "Stable-Arc" welders, announces the appointment of E. A. Thornwell, Atlanta, Ga., as its representative for Georgia and eastern Tennessee. Mr. Thornwell has been associated with the electrical industry in Atlanta, Ga., and Pittsburgh, Pa., since he was graduated in 1904 from Clemson College, South Carolina. John Van Horn, factory engineer for the company, has been attached to the Atlanta office to assist Mr. Thornwell.

ADVERTISING LITERATURE

ATLAS LUMNITE CEMENT COMPANY, INC., New York, has issued an illustrated brochure emphasizing the advantages of using Lumnite cement in the winter. The manufacturers advise that they will send copies to any one interested upon request.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued an attractive booklet on waterwheel-driven generators, showing many hydro-electric installations using this type of generator.

TIMKEN-DETROIT AXLE COMPANY, Detroit, Mich., has recently issued a pamphlet entitled "Efficiency of F. J. Worm Gearing," which is illustrated with pictures and charts.

CROUSE-HINDS COMPANY, Syracuse, N. Y., has issued an illustrated folder descriptive of its floodlight projectors, calling attention to their industrial and other uses.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, December 10, 1927 *Number 24*

Under New Auspices in St. Louis

ANOTHER of the electric railways has just emerged from among those thrown into receivership largely as a consequence of the imposition of war-time economic conditions over which they had no control. The property to which reference is made is the United Railways, St. Louis. From now on the road there will function under the title of the St. Louis Public Service Company.

The way has been carefully prepared in advance, and the new management takes hold under auspicious circumstances, even though the franchise question remains to be adjusted. That is an important matter, but the task does not appear to be an insuperable one. The grant that has been discussed is of the service-at-cost type. The main differences of opinion have been over the matter of valuation and the rate of return. These negotiations have been followed in the news columns. The financial results under the receivership, notably those for the year ended Dec. 31, 1926, have also been reviewed in the JOURNAL.

Frank acknowledgment is made by the new management of the excellent work done by the receiver and by his general manager. More than this, however, the incoming régime has acknowledged the magnitude of the task it is tackling and has sought public co-operation at the inception of its incumbency. It senses the growing needs of the community. The avowed policy is to determine the character of the service desired by the public and then to supply that service. Having done this, the management assumes that the public will gladly pay the fare necessary to maintain it. The new management has made a sincere bid for public co-operation. It has pledged the company in unmistakable terms to do its part. The car riders and the public of St. Louis generally owe it not so much to the company as to themselves to be equally concerned for the welfare of the company. Only as each is concerned about the other can the company carry on successfully and the public benefit.

Experiment in Regulating the Cruising Taxi in Philadelphia

CRUISING taxis have long been the bane of officials intrusted with the problem of expediting street traffic. They run empty a large part of the time and so clutter the streets that they really are more nuisance than benefit. The very growth of the taxi business in large communities has served to defeat that vehicle's attractive features, particularly the feature of speed. In Philadelphia last winter things came to a very bad pass. Congestion there was unusually acute. In some instances it spelled defeat for everybody concerned. It was imperative that something be done. And something has been done. The Yellow Cab Company, under Philadelphia Rapid Transit Company auspices, and the Quaker City Cab Company have agreed to a working arrangement calling for the expansion of the idea of fixed stands in the central business district that would seem to hold forth great promise for the future. Its proposed use, beginning on Dec. 12, is described elsewhere in this issue.

So far as these companies were concerned the matter was apparently easy to arrange. Not so in the case of the Diamond and the Cunningham companies. They are among the smaller independents, and their officers felt that they must be permitted to continue cruising, since their revenue was derived almost wholly from this source. In this attitude they may have been justified, but it is the very attitude that has served to clutter up the streets with vehicles. The way out in this instance was found in their purchase by the Philadelphia Rapid Transit Company. It was a fortunate way for everybody involved, but it is a way not always possible. But the real interest is in what the two other companies have agreed to do. It is to be hoped that the arrangement now about to be put into effect will work out so satisfactorily that the expectation of the companies looking toward the gradual extension of the plan throughout the city may be realized.

Ballots on Engineering Standards Demand Attention

RECOMMENDATIONS of committees of the American Electric Railway Engineering Association are now being submitted to the membership for approval in accordance with the changes in the constitution and by-laws adopted at the Cleveland convention last October. So far returns from three letter ballots have been closed, covering proposed revisions of existing Manual sections or presenting additional sections for approval. The plan is a distinct advance over the old one of having a discussion on the convention floor, followed by an oral vote unless a division was called for. Under the old plan it was necessary for anyone desiring to take an active position favoring or opposing a recommendation to be present in person at the convention or to have an accredited representative. The opportunity for discussion was quite limited on account of the number of recommendations presented, since they covered the work of all the engineering committees for the entire year. Usually most of the recommendations were approved without discussion, and often without some members knowing just what they had voted on.

Contrast this with the new plan. Letter ballots are sent out to the entire membership. It is possible for the company official most familiar with the subject in question to give it his attention and to vote intelligently after mature deliberation and correspondence or conference if necessary. Accordingly, when a standard has been adopted in this manner it should have more weight and member companies should adhere more closely to it than when the former method was in force.

According to an article in the December issue of *Aera*, the returns from the first set of letter ballots were sur-

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prisingly small. It would appear that the membership is not fully acquainted with the plan, particularly since quite a number of companies that are represented on the committees in charge of the standardization work did not cast ballots. With many questionnaires and miscellaneous matter being received constantly, it is not surprising that persons unfamiliar with the new plan might fail to refer the ballots to the proper officials in the organization. It does not seem reasonable that a committeeman who has followed the work should not be able to cast a ballot either for or against the proposed standard.

A second set of ballots was distributed under date of Nov. 2 and a third set under date of Nov. 25. To be counted they must be returned within 60 days. It is to be hoped that more of the member companies will consider the questions submitted and take definite action, since the value of the standards set up depends in large measure on the interest taken in their adoption and in their enforcement. A standard that is a dead letter is worse than useless, since it is misleading.

Standard Bus Accounts Desirable

UNTIL the committee on bus accounting of the American Electric Railway Accountants' Association promulgated its standard classification there was no generally recognized standard available. The committee did an excellent piece of work, and its classification, which has been indorsed by the National Association of Railroad and Utilities Commissioners, is based on the accounts adopted for electric railways by the Interstate Commerce Commission. The A.E.R.A.A. classification has been adopted by a number of bus subsidiaries of electric railways and also by some independents. It is giving general satisfaction.

Naturally, in a field so new as this, there is an opportunity for differences of opinion, and certain of the accounts may be handled in more ways than one. The same is true of any accounting. In order to have comparable statistics it is essential that the same system be used by all the carriers in the territory where comparisons are to be made, whether it is the state or the nation. Since operating methods differ little all over the country there seems to be small reason for a departure from a single system. On the other hand, there is more need for a difference in detail between large operators and small, since it would be burdensome to require the analysis for a small company that is demanded of the large one. This has been taken care of by the committee in the preparation of a condensed system of accounts for small operators.

When the Public Service Commission of Pennsylvania adopted a classification for bus accounts, to go into effect on Jan. 1 next, a number of changes were incorporated that result in more or less variation from the association's system. As mentioned in a news item in this issue, the principal differences are with respect to the handling of taxes, rents and depreciation. While there is some argument in favor of the changes, there is the stronger argument in favor of standardization.

At present two other commissions, those in Iowa and in Wisconsin, are contemplating the adoption of standard classifications for bus accounting. It would seem that now is the time to get together and reconcile all differences. Unless there are reasons for changing from the association's classification, that would seem to be the logical one to adopt. If reasons for a change exist, undoubtedly the committee will welcome suggestions and present them to the membership for adoption. Whatever is done, action should be taken before the various states adopt sets of accounting classifications with differences so great that two or more sets of books will be needed, as may be necessary for interstate operators.

European Roads Tending Toward Fare Simplification

WHILE it is common in this country to think of the street railways of Europe as charging zone fares exclusively, this is very far from true. The lines in England, France and Belgium generally use the zone fare system, but many of those in Italy, Germany and Switzerland do not. In fact, the tendency is rather from the zone fare to the flat fare. The introduction of more one-man cars will help in this direction, though as the wages of platform men are not as high in Europe as here, there is not the same inducement to the adoption of the one-man car.

The lower wages paid in Europe should be borne in mind when comparisons between European and American fares are made, as should also the fact that fewer free transfers are issued than in America. This rarity of the free transfer is an inheritance, probably, from the time when zone fares were in more general use. Where fares vary with the distance traveled, there is no occasion for transfers. When a zone fare road changes to the flat fare the public is not accustomed to transfers and does not expect them. In Europe, Berlin is the most important exception to the rule that universal transfers are not given.

Passenger revenues in Europe are still checked very generally through the issue by the conductor to the passenger of a paper receipt for the fare paid. On the flat fare roads, this practice seems to be still another inheritance from the zone fare system in which such receipts or something corresponding to them are necessary to prevent overriding. To an American, the fare box seems to provide a better means for collecting fares. It is at once less liable to manipulation, is cheaper and faster. Finally, it is neater because it keeps the car floor and street free from canceled tickets. However, here again the strength of long-established habits have to be taken into account. The public and the employees have become accustomed to the fare receipt. They do not mind its disadvantages and the companies declare that its abuse by either employees or passengers is practically nil. At present, progress in Europe in fare collection seems to be more in the direction of ticket-issuing machines than in the abandonment of the paper fare receipt.

The principal improvement in fare practice during the last few years in Europe has been in the direction of having only one class of fare. The Berlin Elevated is the latest large road to change from two classes to one. Among the surface roads those in France and Belgium appear to cling most strongly to the two classes of fares, using them, in some cities, even on cross-bench open cars.

There is no doubt that the system of fare collection used in this country is better adapted to American conditions than is the European plan. We should gain nothing on our flat fare lines by adopting the paper fare receipt, which is primarily a zone fare device. But there is much that can be said in favor of the European method of

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operating through cars between all points where there is considerable travel and then refusing to give transfers. One reason for the low flat fares in many cities abroad is that a fare pays for only one ride, not two or three, as would be the case with transfers. By permitting a lower flat fare, this policy also increases the short-haul business, which is the one where a street railway has to meet competition from walking.

Head of Pennsylvania Motor Federation Condemns Parking

FREQUENTLY when experienced transportation men have pointed out the evils of automobile parking on congested streets they have been accused of attempting to force greater use of public transportation vehicles. But when the spokesman of more than a million owners of private automobiles says the same thing no such accusation can reasonably be made. Unusual significance therefore attaches to the remarks of R. C. Haldeman, president of the Pennsylvania Motor Federation, speaking before the meeting of the Pennsylvania Street Railway Association at Scranton last week.

"The present-day habit of using our streets as a public garage," he says, "is one of the greatest evils tending to increase congestion in the business districts of our municipalities. It is both a selfish and a time-wasting habit of the motor car owner. The individual apparently gives no thought to the inconvenience that his action places on the many. But if the individual still insists on being selfish let him consider the time he is wasting. It averages at least ten minutes to get the car out of a garage in the morning. He drives down town with his mind set on a particularly convenient locality in which to leave his car. At least 99 times out of 100 he finds that place occupied by an earlier riser and he spends ten minutes more looking for some other niche. It is probably three or four blocks from his office or wherever he desires to transact his business. Another ten minutes lost. Life is too short to throw away all this time to satisfy a purely selfish whim."

This states in a nutshell the case against automobile parking. It hurts the automobilist more than it helps him. The number of drivers who benefit is insignificant compared to the number who are inconvenienced, to say nothing of the great majority of the users of the street—the passengers in public transportation vehicles.

Unselfish co-operation between the automobilists and the public transportation systems is the remedy Mr. Haldeman recommends. He has done the public a real service by presenting such a definite, clear-cut statement of the situation. That is good, but the prime requisite today is more general understanding of the evils of parking.

"Narrow-Gage" Purchase an Important Move

SPECIAL interest attaches to the announcement of the purchase by Hemphill & Wells of the Boston, Revere Beach & Lynn Railroad and of the new owners' plans to electrify the system. This comparatively short narrow-gage line handles a relatively dense volume of passenger traffic, serving a limited area. For years its future has been under discussion. In the Massachusetts report on improved transportation facilities in the Boston metropolitan district two major recommendations were made affecting the Boston, Revere Beach & Lynn Railroad. The first was for the Boston Elevated Railway to extend its East Boston tunnel line to a junction in the vicinity of Wood Island station, thereby eliminating the necessity for providing ferry service. The second called for complete electrification of the system.

It is significant that one of the most important recommendations in the report is to be carried out forthwith. It is known that as far back as 1911 plans were prepared for such a project. Whatever the plans of the former owners might have been it is reasonably certain that the work would not have been ordered so soon.

The new service will mean much to the district. The modern cars, comfortable and attractive; the stations, remodeled for prepayment use and refinished, and the high-speed transportation to be maintained by the new electric trains should cause a large increase in patronage. Property owners will realize, too, that values will grow because of the new service. All in all, the purchase by Hemphill & Wells and their plan to electrify are very important moves not only in the districts served by the old Boston, Revere Beach & Lynn Railroad but in the entire electric railway industry as well.

Glorifying the Coffin Award

ADVERTISING, it has been said, is just a combination of showmanship and salesmanship. Surely no better definition could be found for the sound and progressive advertising exploitation launched by Louis J. DeLamarter, vice-president and general manager Grand Rapids Railroad, after his road had submitted its Coffin Award brief and continued so effectively after winning the award.

To electric railway men the Coffin Award means a great deal. They realize that it is the highest honor that can come to any American system and that it represents the reward of progressiveness and superlative achievement in the industry. But to the ordinary layman it might represent almost anything. The task, then, of livening this issue in the minds of the citizenry of Grand Rapids befell Mr. DeLamarter, if winning the award was to mean anything in a dollars and cents way. His previous experience as a showman had taught him the value of capitalizing on public reactions. Accordingly he prepared, so to speak, all Grand Rapids for the possible winning by acquainting it with the Coffin Award and its significance.

The effect was far reaching. The people not only learned what the award was but also what it would mean to the city and to themselves. They realized that their own town was competing with cities such as Chicago and Atlanta and they felt a little prouder of their "Furniture City." A pride in the shiny new street cars that were being advertised the world over as "Grand Rapids" type cars swept over them, and a desire to help win was created among the various civic groups and individuals as well. The Coffin Award was publicized to so great an extent that it bids fair to remain alive for many years in the memories of all Grand Rapids people.

Truly the Coffin Award has been glorified under the impetus of a carefully conducted advertising plan until now it represents to the people of Grand Rapids an "emblem of civic virtue, a badge of merit and a symbol of communal achievement." And all because one alert electric railway salesman realized the capitalization possibilities of such a proposition under the stimulus of a sound and progressive plan of advertising exploitation.

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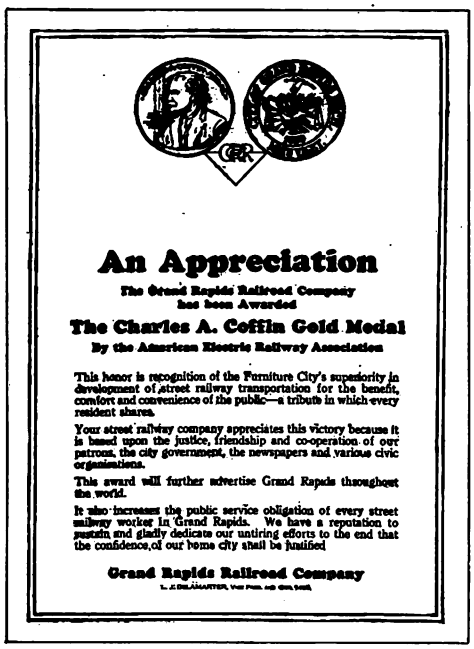

An Appreciation

The Grand Rapids Railroad Company
has been Awarded
The Charles A. Coffin Gold Medal
By the American Electric Railway Association

This honor is recognition of the Furniture City's superiority in development of street railway transportation for the benefit, comfort and convenience of the public—a tribute in which every resident shares.

Your street railway company appreciates this victory because it is based upon the justice, friendship and co-operation of our patrons, the city government, the newspapers and various civic organizations.

This award will further advertise Grand Rapids throughout the world.

It also increases the public service obligation of every street railway worker in Grand Rapids. We have a reputation to sustain and gladly dedicate our untiring efforts to the end that the confidence of our home city shall be justified

Grand Rapids Railroad Company

Advertisement carried by the railroad in all weekly newspapers. Full page ads were carried in the daily newspapers of Grand Rapids

Coffin Award Crowns DeLamarter's Efforts

Committee of Electrical Engineers and Traction Managers Pays Highest Tribute To Innovations and Policies Here

THE GRAND RAPIDS
SPECTATOR

WHAT TO SEE AND WHAT TO DO

THE "GRAND RAPIDS" TYPE OF STREET CAR

PUBLISHED BI-WEEKLY BY THE
Grand Rapids Association of Commerce

Volume XVI OCTOBER 8, 1927

Above, the cover of the Grand Rapids "Spectator." In center, newspapers proved a powerful aid in publicizing the award

Capitalizing the Coffin Award

All Grand Rapids knew in advance of the Coffin Award and its significance, because of a careful plan of advertising. When the medal was won enthusiasm became universal and citizens joined the railroad in acclaiming the victory

DETERMINED to capitalize to the fullest extent his company's entering the Coffin Award contest, L. J. DeLamarter, vice-president Grand Rapids Railroad, Grand Rapids, Mich., planned a series of car cards and gave details of the contest to all the local newspapers for publication. He explained to the people of Grand Rapids just what the Coffin Award was and what it meant, showed them the wares of his railroad and sold the thought that in their city existed the most progressive street railway system in the country. Few, if any, disputed the company's chance of winning, even though it was competing with much larger roads.

Upon winning the award, the railroad immediately spread the news. Car cards, newspaper write-ups and full-page advertisements in the local papers told the people of Grand Rapids that the great honor about which they had already been informed had been bestowed upon the railroad of their city. Many business houses of the city congratulated the railroad in advertisements carried in the local papers and profited with the company in the winning of the award. Resolutions, congratulatory letters and messages poured in and editorial columns praised the city's electric railway which had proved itself supreme.

Six progressive car cards told the story in an effective manner. They related that Grand Rapids was competing with cities such as Chicago and St. Louis, that winning the Charles A. Coffin Award corresponded to winning the World's Championship in baseball, that the medal if brought to Grand Rapids would advertise the city throughout the world, and that the railroad's biggest asset was the splendid, progressive spirit of Grand Rapids people. The copy of the first card reads:

To our patrons:

Your Street Railway is competing with Chicago, St. Louis and other large cities for the

Charles A. Coffin Gold Medal

given each year to the street railway whose achievements represent the most distinguished contribution for the benefit and convenience of the public.

If Grand Rapids wins, it will be largely because of your sympathetic co-operation, your moral support, your patronage.

This was followed by a card pointing out the importance of the award to the industry and the road winning it.

The Charles A. Coffin Gold Medal Will Be Awarded to Some City Early in October.

In the street railway industry, it is like the World Championship in baseball.

We are after this "world championship" for Grand Rapids. If we win, it will be more of a victory for Grand Rapids and Grand Rapids people than for the Grand Rapids Railroad Company.

All publicity conveyed the feeling that the city and its people and not the efforts of the railroad were responsible for the progressiveness of the street railway system. The people were made to believe that they were competing

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and that in the event of winning, the victory would be theirs. Another of the cards best exemplifies the theme of the advertising plan as a whole:

We cannot hope to compete with such cities as Chicago and St. Louis on the basis of miles of track, number of cars or volume of business. But we have an asset in the splendid, progressive spirit of Grand Rapids people with which we do not hesitate to challenge the world.

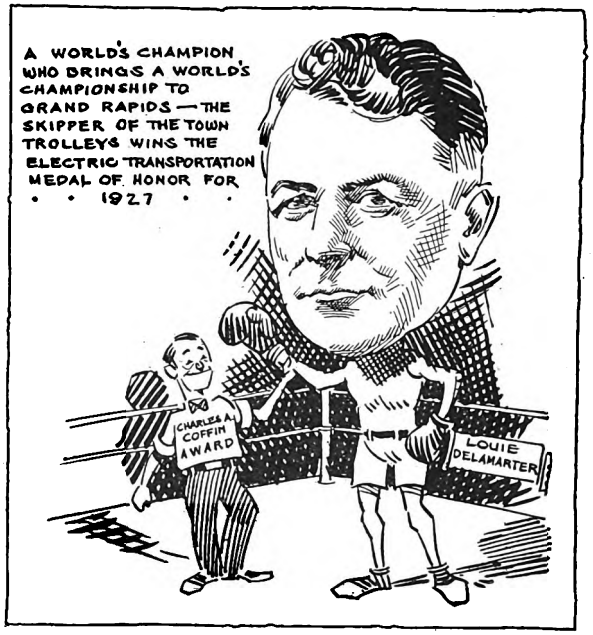
If We Can Win the Charles A. Coffin Gold Medal for Grand Rapids, It Will Be a Triumph for Your City and for You.

Newspaper publicity supplemented the car cards in relating the purpose and history of the contest, the names of the competing railways and how the prize of $1,000 would be given to employees' benefit organizations, if won. The papers also pointed out that the brief submitted by the railroad company had stressed the importance of the enthusiastic, loyal and sympathetic cooperation of the Grand Rapids municipal authorities, newspapers, civic organizations and general public as the predominating argument for the favorable consideration of the judges.

The following statements by Mr. DeLamarter, published in the local papers on Sept. 30, conveyed a feeling of confidence that the company did have a chance against its powerful competitors:

It may seem presumptuous to some of the bigger companies in the street railway industry, and to some of the Grand Rapids people for the Grand Rapids Railroad Company to enter this competition with the leading companies of the United States, but we are just egotistical enough to believe that our showing here with our new electric rail coaches and other innovations is rather conclusive evidence that "Grand Rapids Knows How."

If we should win this award, against the stiff competition of Chicago, St. Louis and the other large cities of the country, it must be largely on the strength of the friendly, constructive assistance and co-operation we have had in Grand Rapids. In sheer



Cartoon appearing in the "Razzing the Rapids" section of the Grand Rapids "Herald"

bulk and volume of business, mileage of track, number of cars, etc., we could not hope to compete successfully against the great centers of industry and population.

Public relations, economy, progressive methods, safety and efficiency of operation are not elements measurable by mere size, so on these points the Grand Rapids Railroad Company is justified in entering into competition with any of them.

The business-like preparation of the advance publicity served well the purpose for which it was intended. All Grand Rapids had contributed and upon the eve of announcing the winner all Grand Rapids eagerly awaited

Local merchants and companies congratulated the railroad in advertisements carried in special sections of the local papers

Another page from a "Gold Medal" edition. All Grand Rapids rejoiced in the victory of the railroad company

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GRAND RAPIDS, MICH., Oct. 26, 1927.

MR. L. J. DELAMARTER,
Vice-President and General Manager

DEAR SIR:

The Grand Rapids Railroad Company's Employees' Mutual Protective and Benefit Association wishes to again congratulate you on your success in winning the Charles A. Coffin Award for our company. We also appreciate being recognized as helping to do our bit toward winning this award and we, as an association, pledge ourselves to keep our shoulders to the wheel to help maintain the high standard which has been achieved, and we stand ready to help in any further cause you may desire toward the betterment of our company.

At our meeting held Tuesday, Oct. 25, it was voted to extend you a rising vote of thanks for the $500 prize money and the splendid entertainment furnished us on the 19th, which was greatly enjoyed by all present. It is very pleasing to our members to hear the words of praise spoken by our passengers of the way this prize money was distributed by you, and we wish to assure you that we all feel proud to be associated with a company that has gained such high honors.

Very truly yours,
MAX HANNA,
Secretary Grand Rapids Railroad Company's Employees' Mutual Protective and Benefit Association.

"Proud to be associated with the company" is the keynote of this letter from the employees' protective association

the decision that might bring to their city the title of "Gold Medal City."

When the news broke everyone rejoiced. The stage had been set and the citizenry joined the railroad in acclaiming the victory. The company officially announced the receipt of the award by full-page newspaper advertisements, by advertisements carried in weekly publications and by car cards.

GRAND RAPIDS, MICH., Oct. 13, 1927.

MR. L. J. DELAMARTER,
Vice-President and General Manager
Grand Rapids Railroad Company,
Grand Rapids, Mich.

DEAR MR. DELAMARTER:

We, the officers and members of Division 836, congratulate you and the Grand Rapids Railroad Company for the opportunity given us to do our bit in winning the Coffin Award.

We realize it was only through the efforts of you, Mr. DeLamarter, that this was made possible, and we again congratulate and thank you.

Very truly yours,
CLAUDE W. FISHER,
President Division 836 Amalgamated Association of Street and Electric Railway Employees of America.

Letter of appreciation from the Amalgamated Association revealing the fine spirit existing between the employees and the management

Newspapers, merchants and railroad all joined in capitalizing the victory, for on the day following the announcement advertisements congratulating the railroad on its accomplishment were given to the papers by many local companies and merchants, as well as two railway equipment manufacturers, the Haskelite Manufacturing Corporation and the St. Louis Car Company. One paper devoted an entire section to acclaiming the victory. Others responded with "Gold Medal" editions.

The complete success of the railroad's educational plan was best evidenced by the many editorials appearing in the newspapers and the felicitations tendered Mr. DeLamarter and his associates by civic bodies, publications, social organizations and other groups. There followed resolutions, telegrams and complimentary speeches. The enthusiasm, which became universal, was climaxed by a dinner gathering at which Mr. DeLamarter and his associates were paid high tribute.

Typical of the telegrams congratulating Mr. DeLamarter and his company is the one sent by the Governor of Michigan:

Permit me to congratulate you upon award of Charles A. Coffin gold medal. It is splendid recognition of work well done.
FRED W. GREEN
(Governor State of Michigan)

Another, from a State Senator, shows the feeling of indebtedness inspired by the railroad:

Accept my congratulations upon having received the Charles A. Coffin gold medal. The city of Grand Rapids has been honored through your untiring efforts and is indebted to you for same. I anxiously await your return to congratulate you in person.
JAMES C. QUINLAN
(Senator State of Michigan)

Bespeaking the sentiments of the entire city, the Mayor of Grand Rapids wired:

Congratulations on receiving the Coffin Award. Your work here certainly justifies that distinction. The entire city unites in these felicitations.
ELVIN SWARTHOUT
(Mayor City of Grand Rapids)

A desire to exhaust all the capitalizing possibilities of receiving the honor prompted Mr. DeLamarter to take further steps. At a big party for all the company's employees two checks of $500 each, representing the cash prize which accompanied the Coffin medal, were presented, one to the president of the local division of the Amalgamated Association of Street and Electric Railway Employees of America and the other to the president of the Grand Rapids Railroad Company's Employees' Mutual Protective and Benefit Association. A musical program and a speech by Dr. A. W. Wishart of Grand Rapids, who lauded the co-operation of the employees and management, made the evening a most enjoyable one and added to the effectiveness of distributing the cash prize.

A final ambassador of good will was sent forth to the people of Grand Rapids in a sincere expression of appreciation of the "justice, friendship and co-operation of our patrons, the city government, the newspapers and various civic organizations." Tying together reproductions of the Coffin Medal, the City Seal and the company's triangular shaped monogram to be painted on the cars, the advertisement struck the keynote of the whole campaign.

In addition to placing this new design on the cars, gummed paper replicas of the front and reverse of the medal have been made in gold for use as stickers on company correspondence, carrying far and wide the information that Grand Rapids won the Coffin Award.

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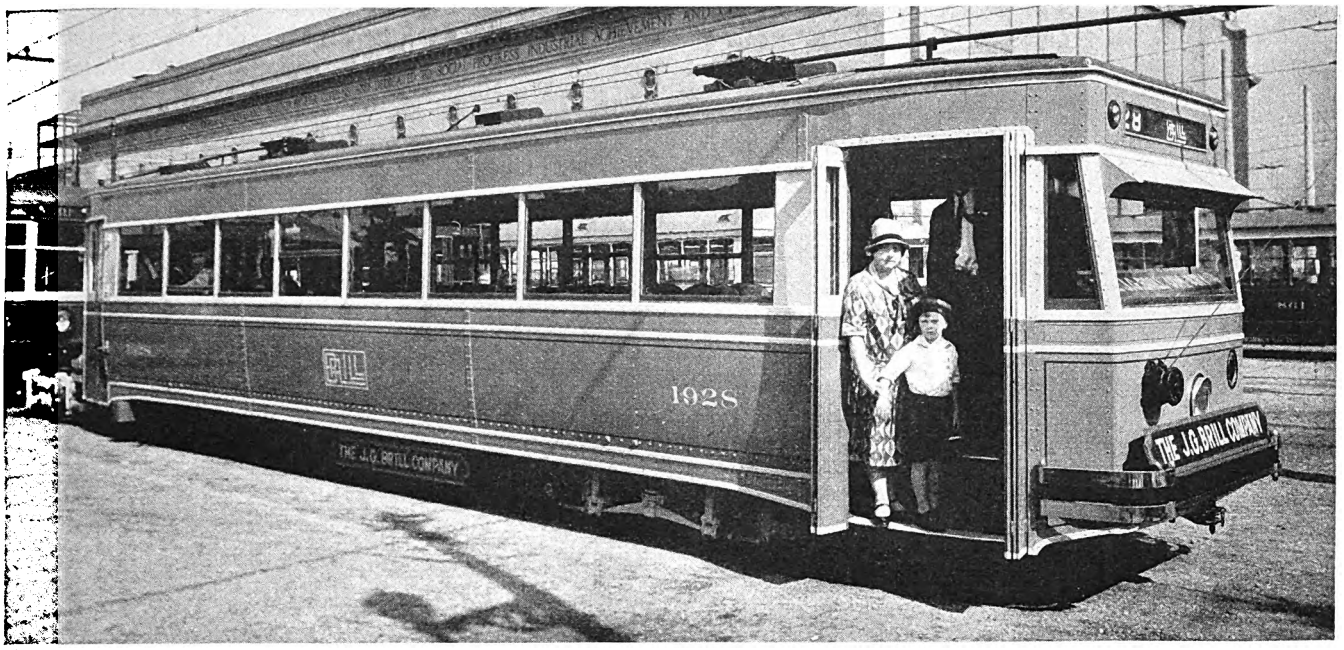

Wide-angle full-vision side windows with 42-in. post centers add to the attractiveness

De Luxe Trend

Shown in the New Brill Car

The 1928 model, as it is called, has graceful lines, sloping front end, motors spring mounted crosswise of trucks using Nuttall speed reducing units with helical gears

LIGHT weight, low floor height, improved appearance, greater comfort, increased efficiency and less noise are features of the new Brill 1928 model electric car which was shown to the electric railway industry for the first time at the Cleveland convention and has just been placed in service on one of the surface lines in Brooklyn. Tests of the cars were made in Cleveland immediately following the convention.

This development in car construction embodies many features that are entirely new to the electric railway industry, yet at the same time it retains most of the fundamentals in design and construction that have been responsible for the economic advantages of the electric car. In the design of this car the Brill company has recognized the importance of substantial construction for safety and durability. Low maintenance costs have been considered, together with a design that will be reasonably light in weight and of low energy consumption, rapid acceleration and retardation in order to speed up operating schedules.

While all of the radical features of design introduced in this car are of particular interest, the innovations in the trucks, especially the manner in which the high-speed motors are mounted and the method that is used to transmit power to the axles, are of outstanding importance. Two Westinghouse 35-hp. 300/600-volt d.c. motors are supported on angle brackets between the end frames and transoms so that their entire weight is spring mounted, leaving only the wheels, axles, roller bearing journals, brake drums and half of the gear units as unsprung weight. The motors are connected by universal fabric joints to the specially developed reduction gear unit of Nuttall deep helical type. The gear ratio is 8.38 to 1.

This achievement is the result of three years of experimental and practical engineering development together with test work. The Westinghouse-Nuttall drive is a unit of gears operating entirely in oil so designed that 22-in. wheel trucks may be used with greater clearance under the motors than was formerly possible with 26-in. wheels. This drive is quiet running, permits the use of motors higher in speed and lighter in weight than is usual, and makes it practicable to use roller bearings for the armature. Axle bearings are eliminated from the motor, as it is entirely spring borne through a truck frame suspension. The result is rapid, smooth acceleration, high efficiency and low maintenance cost. With the gears inclosed and constantly lubricated, it is logical that gear noises will be reduced to a minimum. In other general features the trucks, which are type 277-Ex-1,

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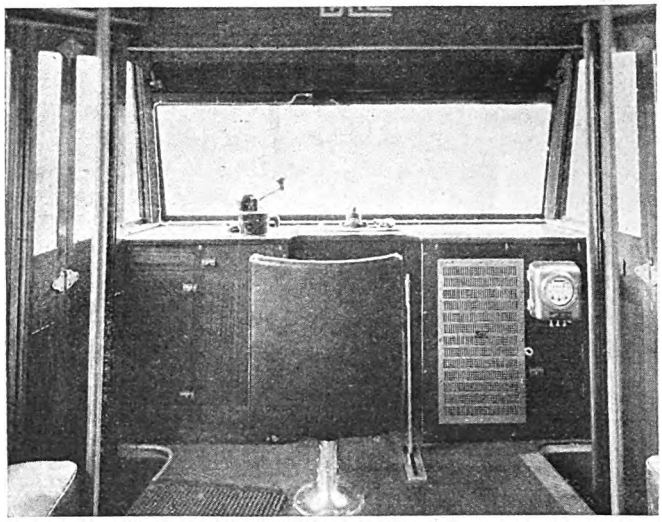


The equipment cabinets at the ends fit into the sloping fronts and give a finished appearance

conform to conventional practice. The side frames are solid forgings, light in weight. The graduated spring system contributes to the smooth and comfortable riding.

As a further means of reducing noise, instead of using shoe wheel brakes a brake drum is located on each axle, against which a set of clasp-type brakeshoes of special design are pressed by means of a separate Westinghouse brake cylinder for each drum. The brake mechanism is of the external contracting clamp drum type with two shoes or blocks per drum, the shoes being of a special composition, suspended in such a manner that they are practically noiseless. By mounting the cylinders on the truck instead of on the car body, considerable body brake rigging is eliminated which would have a tendency to cause rattling and disagreeable noise. The air brakes are

TABLE I—TEST ON BRILL 1928 CAR, CLEVELAND RAILWAY —EUCLID AVENUE LINE POWER CONSUMPTION

Car Weight 30,000 lb. Load 4,860 lb. Total 34,860 lb.
Four Westinghouse Type 1425 Motors 8.38:1 Gear Ratio 22-in. Wheels

Location	Mileage	Meter Reading	Kw.-Hr.	Kw.-Hr. per C.M.
Windermere	13.22	237.8	32.7	2.47
Windermere		270.5		
Windermere	13.22	277.8	33.6	2.54
Windermere		311.4		
105th St.	10.74	330.0	23.5	2.18
Windermere		353.5		
Windermere	13.22	354.8	31.9	2.41
Windermere		386.7		
Windermere	13.22	387.7	30.8	2.33
Windermere		418.5		
Totals.....	63.62		152.5	2.4

Westinghouse electro-pneumatic type. Timken roller journal bearings are used.

The car body is constructed of pressed steel and structural shapes with aluminum letter panels and side sheathing. The body design conforms generally to the graceful lines of the motor bus. While a tendency is shown to reduce weight, particular attention has been given to providing necessary strength so as to stand up under the severe requirements of electric railway operation. Side sills are 3-in. x 3-in. x $\frac{5}{16}$-in. angles and end sills are of a box type built up of two 3-in. channels as sides with top and bottom plates. Crossings are of pressed-steel fish-belly type. Outside platform knees are 7-in. channels and center platform knees are 3-in. channels. Bolsters are of the box girder type with $\frac{1}{2}$-in. bottom plate, $\frac{3}{8}$-in. top plate and $\frac{3}{16}$-in. web. The latter are fastened to each other by means of diaphragm connections.

The body frame has pressed U posts of No. 16 gage steel and a double-belt rail of aluminum, $2\frac{1}{2}$ in. x $\frac{3}{8}$ in. The letter panel is $\frac{1}{8}$-in. semi-hard aluminum, $15\frac{1}{2}$ in. deep. Aluminum gutters form the top molding and half oval aluminum is used for the bottom. The letter panel has U-pressings at the top. Panels are curved at

TABLE II—ACCELERATION TEST ON BRILL 1928 CAR, CLEVELAND OHIO—OCT. 19, 20, 1927

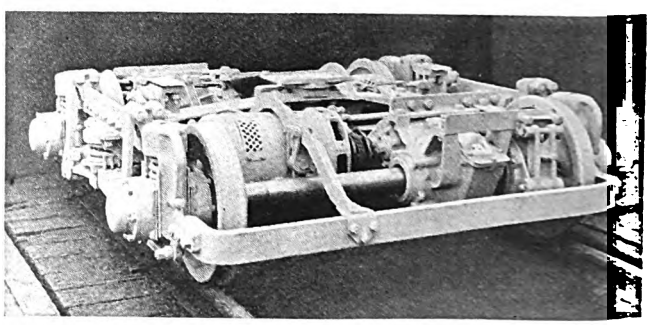
Car Weight 30,000 lb. Load 5,000 lb. Total 35,000 lb.

Test No.	Amperes per Motor	Trolley Volts	Distance Feet	Time Seconds	M.P.H.P.S. from Distance	M.P.H. M.P.H.P.S. from Motor Curve	M.P.H.P.S. from Motor Curve
Windermere Yard							
1	177	570	20	3.2	2.7	11.8	3.7
2	162	565	30	4.6	1.9	12.0	2.6
3	177	563	25	3.8	2.4	11.7	3.1
4	162	563	25	4.0	2.1	12.0	3.0
5	162	548	25	3.4	3.0	11.8	3.5
6	141	562	40	5.2	2.0	12.7	2.4
7	141	557	40	4.8	2.4	12.4	2.6
Kuhlman Track—Toward St. Clair Avenue							
8	150	555	30	4.0	2.6	12.0	3.0
9	171	563	25	3.4	2.9	11.6	3.4
10	186	548	15	3.2	2.0	11.2	3.5
11	198	530	10	2.0	3.4	10.6	5.3
12	204	530	10	2.4	2.4	10.6	4.4
13	195	553	13	2.6	2.6	10.9	4.2
14	201	555	13	2.4	3.1	10.7	4.4
Kuhlman Track—Away from St. Clair Avenue							
15	207	545	15	2.4	3.5	10.9	4.5
16	210	535	13	2.6	2.6	10.5	4.0
17	213	535	13	2.2	3.7	10.5	4.8
18	219	545	15	2.2	4.2	10.5	4.8
19	225	520	10	1.8	4.2	10.3	5.7
20	222	535	15	2.0	5.1	10.4	5.2
21	165	550	40	5.2	2.0	11.5	2.2
22	174	545	40	4.4	2.8	11.3	2.6
23	150	565	30	4.2	2.3	12.2	2.9

the floor line and side sheets are of hard aluminum, $\frac{1}{8}$ in. thick. The window sill capping is No. 16 gage steel, and pressed gussets are used at each crossing. The posts have ash fillers and all sheet steel is copper bearing. End headers are eliminated and corner posts and end carlines are of special design. Joints between the window sill and post are welded.

Vestibules have a width of 7 ft. at the car body and are tapered toward the front. The front sash is sloping, similar to that in the Springfield car. This has a visor and ventilator in back of it. The construction below the windows is also of the Springfield car type.

The roof is $\frac{5}{16}$-in. plywood. Roof rafters are of pressed U shapes filled with wood and not cut. The roof is fastened to the rafters with glue and screws and crowned $10\frac{1}{2}$-in. Hoods are of plywood. Unusually low floor height has been obtained with the use of 22-in. diameter wheels. This small-diameter wheel was made possible only through the use of smaller motor dimensions and a reduction in the amount of equipment under the car body. The car floor is only $28\frac{3}{4}$ in. above the rail. Consequently but two steps are required. These are stationary inside the folding doors. The first is 15



Motors mounted on the truck frame parallel to the axles are connected to gear boxes through universal joints

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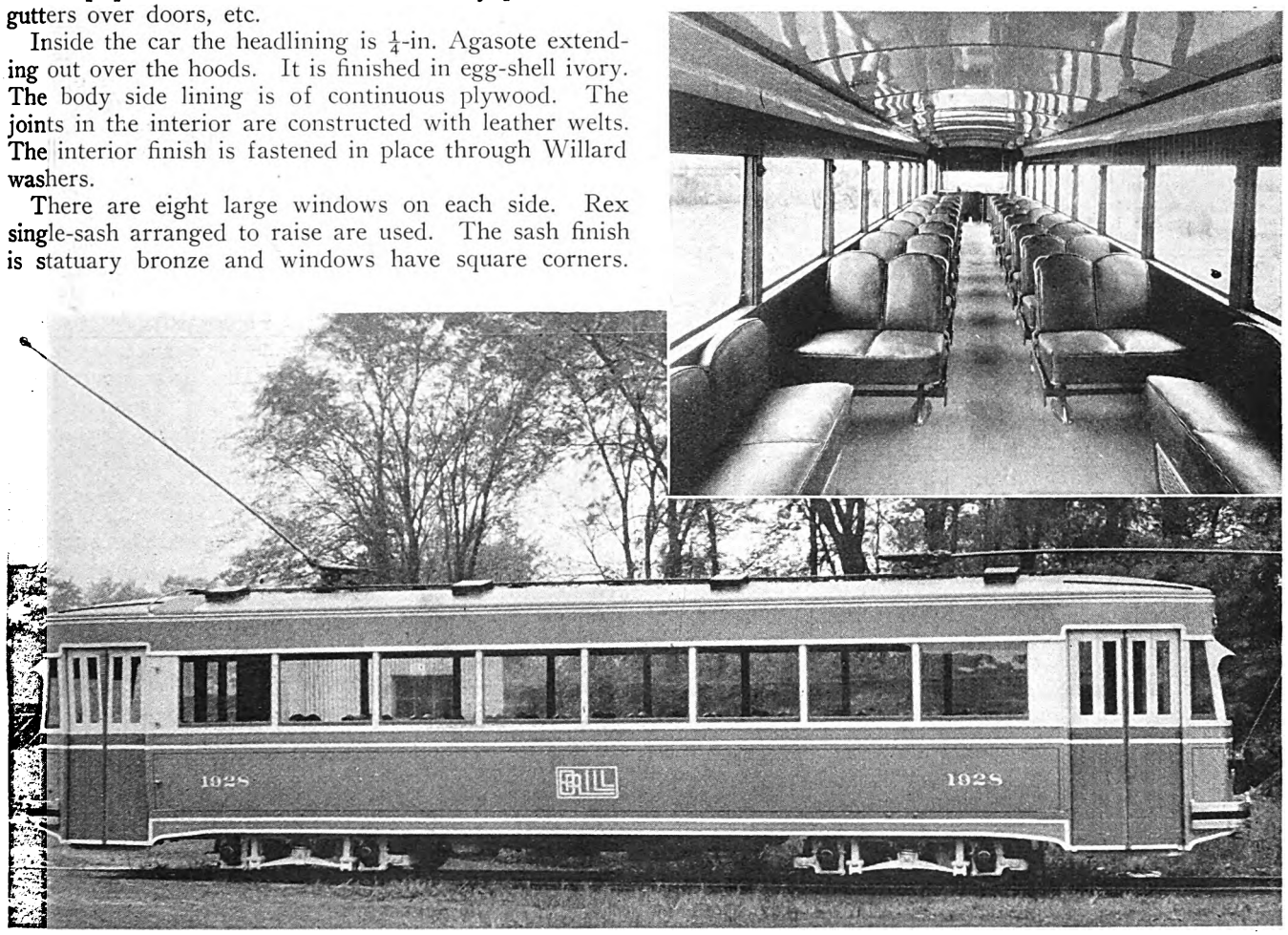
in. above the rail and the second 13¾ in. to the car floor. There is no floor ramp. The flooring is 1 1/16-in. fir, top dressed and treated with Saums preservative. The floor is laid longitudinally and is bolted to cross members. There are no trap doors. The floor covering is 3/16-in. battleship linoleum, green in color.

On the roof two running boards, ⅞ in. thick by 5½ in. wide, extend the full length of the body. The trolley base is insulated from the trolley boards with rubberized felt. Eight steps are available for roof mounting and other equipment includes roof mats, trolley pole hooks, gutters over doors, etc.

Inside the car the headlining is ¼-in. Agasote extending out over the hoods. It is finished in egg-shell ivory. The body side lining is of continuous plywood. The joints in the interior are constructed with leather welts. The interior finish is fastened in place through Willard washers.

There are eight large windows on each side. Rex single-sash arranged to raise are used. The sash finish is statuary bronze and windows have square corners.



Built low to the ground the Brill 1928 car invites prospective passengers. Walnut finish for the interior with brown leather seats with sloping cushions and backs to give a pleasing effect

Each sash has two locks and racks. Plate glass 3/16 in. thick is used in the stationary front sash for the vestibules. The small side sash of the vestibules, and all other glass in the body, side windows and doors are of ⅛-in. selected Libbey Owens glass.

Doors are 1 1/16-in. mahogany with no glass below the belt rail. The doors are of a two-part folding type arranged to swing outward and have a 34-in. opening in the clear. They are located at each corner of the platform. Automatic treadle devices are placed at the rear right-hand side doors. For operation small-type engines are used. The car being arranged for one-man, double-end operation, entrance at the front and exit at the rear insure circulating load.

Bumpers are solid with a projection of 6 in. They are secured to the vestibule underframe by spring-steel brackets. Bumperettes are provided at corners.

Inside the car body Brill type 201-B-1 passenger seats embody a slope to the cushion and pitch to the back designed to provide maximum passenger comfort. All seats are in keeping with the modern trend in this direction. A Brill No. 1006 operator's seat at each end is not only adjustable for leg length by a sliding device but is also adjustable for height, and is reversible so that it can be used as a passenger seat when the car is going in the opposite direction. When in position it is locked by a clamp. Operating equipment is concealed in vestibule cabinets so that there is nothing to mar the beauty of the mahogany interior trim, which is stained walnut. This, together with the sloping windshield at each end, gives an inviting appearance.

The exterior paint scheme is a plain, pleasing combination to carry out the streamline effect. Old rose or clover club color is used for the main body panels and letter panels, with the relief trimmed in cream. Striping and decorations are of gold leaf. The roof is dark green and the trucks are the same color to harmonize with it. The finish used on the car is Duco.

A notice "Watch Your Step" is stenciled on each step riser, and the words "In" and "Out" appear over the doors—"In" for the front doors, and "Out" for the rear doors. Inside the car the words "Leave at Rear Door" appear on the ventilator cover over the operator's position.

Located over the vestibule windows in the letter panel is a sign of the Hunter type carrying route number and destination readings.

To obtain data on the performance of the 1928 model

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car, tests were conducted over the tracks of the Cleveland Railway and also at the plant of the G. C. Kuhlman Car Company. Information was obtained showing the maximum temperature rise of the motors in city service, energy consumption, maximum rate of acceleration and retardation, coasting resistance, and freedom from noise. The service tests were made on the Euclid Avenue line. To approximate the average all-day load, brake shoes were placed on the car. This, together with the test observers, gave a total load of 5,000 lb. With the 30,000 lb. weight of the car, this made 35,000 lb. for the average weight of the car in all day service. For convenience in segregating the various data the line was divided into sections, one being in a congested district and another in a non-congested condition.

TABLE III—BRAKING TEST ON BRILL 1928 CAR, CLEVELAND, OHIO, OCT. 20, 1927

Test No.	Distance to Stop in Feet	Seconds to Stop	M.P.H. at Start of Braking	M.P.H.P.S. Braking Rate
1	62	4.4	19.2	4.4
2	75	5.0	20.5	4.1
3	85	5.4	21.5	4.0
4	80	5.0	21.8	4.4
*5	110	6.2	24.2	3.9
**6	100	6.0	22.7	3.8
**7	85	5.5	21.1	3.8
**8	110	5.8	25.9	4.5
**9	110	6.0	25.0	5.0

* Emergency braking from dead-man's handle.
** Emergency braking from air brake handle.

In the test to determine energy consumption the meter was connected to read only the energy supplied to the traction motors and did not include that used by lights, heaters or compressors. Accompanying tables show the data obtained. The tests show an average of 2.4 kw.-hr. per car-mile for 63.6 miles operation between Windermere and the public square. Energy used in turning the car at Windermere and other operation not representative of revenue mileage was neglected. Operation was during the most congested hours when stops were most frequent. Due to operation between cars on regular runs, the car was not operated in the same manner as would be a car in revenue service, since acceleration and braking in many cases were faster. In the service on Euclid Avenue there were no hills, hence no power is included for the effect of grades as encountered in most cities. The results, however, show what can be expected for the service and grades on this particular line.

To determine acceleration rates, the car was tested on a section of tangent and practically level track. Starting was from the same point in all tests, the controller handle being moved by the operator at practically a uniform rate. Meters gave the trolley voltage and current per motor. The time to reach full parallel position of the controller was recorded and the distance from the start to the end of the acceleration on resistance was also obtained. Readings were made instantaneously and simultaneously.

No attempt was made to obtain the maximum acceleration during every test and the results in the table are for various rates to ascertain the effect on both the car and passengers during normal and high car acceleration. In one test more than 5 m.p.h.p.s. acceleration rate was obtained. The wheels were just at the slipping point and it would therefore appear that this rate is the maximum possible. This is probably three times as high as is normally employed on most railways. In regular operation acceleration rates of 2 to 2¼ m.p.h.p.s. can be maintained without difficulty.

In making the test for high and maximum braking rates, the car speed was obtained by measuring the distance covered from the time the brakes were applied to standstill, and recording the time for this distance. From these observations car speed and retardation rates were calculated. Tests were made to obtain average service braking as well as emergency results, this latter being from both the dead man's feature and the emergency position of the air-brake handle. The emergency results from the dead man's handle showed 3.9 m.p.h.p.s. braking rate. Emergency stops made with the air-brake valve gave rates from 3.8 to 5 m.p.h.p.s. An accompanying table gives other tests. These braking rates are very high for street cars, but were not sufficient to cause discomfort to a passenger except at the final jerk when the car came to a stop. In service, when the operator applied the brake to slow down at a high rate and then eased off before stopping, the sensation of high braking rate was not objectionable. These tests indicated that braking rates of from 3 to 4 m.p.h.p.s. could be obtained in revenue operation if the car were late and an attempt made to make up time.

To obtain values of coasting resistance, a section of tangent and approximately level track between Highland and Cove Avenues on Clifton Boulevard was measured accurately to obtain the distance between poles over a stretch of twelve pole spacings. The car was accelerated to a speed of 20 to 25 m.p.h. and power then shut off a short distance from the first pole. At the first pole a stop watch was read and the time obtained for each pole spacing as the car coasted past. From this time and the distance the average speed in the section was obtained. The rate of decrease of this average speed is the retardation rate of the car. Tests were repeated several times from various speeds, and in both directions to compensate for any slight wind velocity and for any grade. The results show the resistance varying from 32.1 lb. per ton at 25 m.p.h. to 13.7 lb. per ton at 10 m.p.h. These values of retardation resistance are for coasting only and do not represent values of train resistance during the time the motors are drawing power from the line. During acceleration the train resistance is less than the values given above for coasting resistance.

GENERAL DIMENSIONS OF BRILL 1928 MODEL CAR

Length over corner posts	30 ft. 0 in.
Length over vestibules	39 ft. 8 in.
Length over bumpers	40 ft. 8 in.
Length of platform over vestibule	4 ft. 10 in.
Length of transverse seats	35 in.
Width of car at belt rail	8 ft. 4 in.
Extreme width	8 ft. 4¼ in.
Height, rail to top of floor	28½ in.
Height, top of floor to top of roof	7 ft. 2 in.
Height, floor to underside of ceiling at centers	6 ft. 10 in.
Height, floor to belt rail	30¼ in.
Height of window opening	29½ in.
Height, rail to top of step	15 in.
Height, top of step to platform floor	13¾ in.
Truck centers	20 ft. 0 in.
Truck wheelbase	4 ft. 10 in.
Seat centers	2 ft. 7 in.
Post spacing	42 in.
Size of wheels	22 in
Seating capacity	45
Weight of car body	12,636 lb.
Weight of seats	1,814 lb.
Weight of electric control apparatus	1,300 lb.
Weight of air brakes	1,200 lb.
Weight of trucks less motors and gears	9,026 lb.
Weight of motors and gears	4,024 lb.
Total weight of car complete ready to run	30,000 lb.

Tests of heating showed that the motor capacity was ample for the service. The maximum temperature rise obtained was 31.5 deg. C. Observations of noise made by the car, both inside and outside, showed considerably less than on most cars. This was due to the small value of unsprung weight, which reduces noise at rail joints and on special work, and to decreased noise in gearing.

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San Francisco Purchase Urged

Delos F. Wilcox recommends to city that it take over railway properties as the franchises expire. Offer of $1,000,000 for California Street Railway and $20,000,000 for Market Street Railway suggested

SAN FRANCISCO received a preliminary report on its street railway problem submitted by its expert, Dr. Delos F. Wilcox, under date of Nov. 1, 1927, and it is now available in printed form. It is devoted primarily to recommendations as to action by the city following the early expirations of a number of the franchises of the two street railway companies now operating in San Francisco. There are also comments on the policy of unification of these systems with the present San Francisco Municipal Railway, all to be under municipal ownership and operation.

One of these roads, the California Street Cable Railway, operates a narrow gage cable railway with 11 miles of single track, and its franchises expire in 1929. Dr. Wilcox considers that operation by cable, at least over large portions of the route of this company, should be continued. The company has no funded debt. On its $1,000,000 of capital stock it has been paying dividends of 7.2 per cent, though, of late, these dividends have not been earned in current operation. They have been paid out of accumulated surplus.

In 1926 the total operating revenue was $532,537, or 38.24 cents per car-mile, but the operating income after taxes and depreciation was only $9,858. During the first half of 1927 there was an operating deficit. This poor recent showing is due in large part to extraordinary expenses for personal injuries, which during this six-month period amounted to more than 31 per cent of the operating receipts. For the last five years—1922 to 1926 inclusive—this charge was only 5.28 per cent, a more reasonable figure, though still nearly double that on the municipal railway and Market Street Railway.

Basis of Valuations Adopted

No valuation of the company's property has been made by the Railway Commission or city engineer, but, based on the city engineer's figures for somewhat similarly situated cable lines belonging to the Market Street Railway, the reproduction cost new of the California Street line is estimated at $1,938,432. If 30 per cent is deducted for depreciation and $125,000 for paving which would belong to the city upon expiration of the franchises, the amount left would be $1,231,902.

If the California Street line was taken over Dr. Wilcox points out that the city would lose the taxes now paid by the company, which last year amounted to $49,858, but that amount would be saved from the operating expenses. On the other hand, the trainmen's wages would have to be increased from the company's standard of $1.12 per car per hour to the municipal railway's standard of $1.63 per car per hour. On the basis of car-hours run in 1926 the increase in trainmen's wages would be $98,910. On the basis of the company's five-year average the operating income available for return would then be approximately $26,000 per annum, or the equivalent of 5 per cent on $520,000. This figure, Dr. Wilcox says, may be considered as the amount of money which the city could afford to pay for this property with the hope of being able to pay operating expenses and interest on the investment under a 5-cent fare.

The property of the Market Street Railway, the principal privately owned line, was valued by the California Railroad Commission engineers as of Dec. 1, 1916, and in the reorganization case these engineers brought the figures by book additions and deductions up to June 30, 1920. The figures on four bases as found by them at that time follow:

Historical reproduction cost	$29,929,069
Historical reproduction cost, less depreciation	24,677,808
Reproduction cost new, based on average prices of the three-year period ended June 30, 1920	50,571,625
Reproduction cost new, less depreciation	40,700,987

Commenting on these bases, Dr. Wilcox says:

Historical reproduction cost as found included the present market value of land as of the date of the appraisal, plus an amount for other property based on the actual work done and the actual quantities in place at the date of the appraisal and an estimate of what the actual cost properly chargeable to capital account had been. This estimate included contingencies in varying percentages applied to individual accounts, and general overheads for engineering, law expenditures, interest during construction, injuries and damages, taxes and miscellaneous expenses aggregating about 13½ per cent of the base cost of the structural property.

Historical reproduction cost less depreciation was intended to represent the historical cost new as above defined, less accrued depreciation "considered solely from the physical condition standpoint" and "estimated on the straight-line theory, the data forming the necessary elements of age and life being fixed respectively from the records, inspection and the experience of this company." In its effect, the finding of accrued depreciation as of the appraisal date, June 30, 1920, was that the property was in 80 per cent condition, or, in other words, worth four-fifths what it would have been worth if new. On the basis of estimated cost, the average condition of the investment as found was slightly higher, namely, 82 per cent.

The term reproduction cost new as used in this appraisal was defined as "the estimated cost in cash of reproducing the physical property of the public utility in the State of California, as of the date of valuation, to which is added the value of all lands, based on the market value of adjacent and similar lands, the actual or estimated cost of acquiring franchises, water rights, etc., and the estimated cost of overhead expenditures for engineering, law, interest and similar items." As above shown, the price basis used was the average of construction costs for the three-year period ended June 30, 1920. That date was approximately at the peak of the street railway construction costs following the war.

Dr. Wilcox says that the 1920 figure for reproduction cost new, quoted above, obviously does not show its value now or in 1929, when the franchises expire. With the historical reproduction cost the condition is very different as it can be easily brought up to date. He estimates the historical reproduction cost as of Dec. 31, 1926, for the company and its suburban subsidiaries at $30,803,280. He then deducts 30 per cent for depreciation, which brings this figure to $21,562,296, from which he says a paving item of $2,955,019 could properly be deducted, as it would belong to the city on the expiration of the franchises.

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The report gives a list of the outstanding securities of the Market Street Railway on Dec. 31, 1926, with the par value, which was $43,821,450; their market price, five-year average, which was $21,966,581, and their market price, 1926 average, which was $19,622,834.

The report also mentions another method of valuing the property, i.e., on its earning basis. The average yearly income during the past five years was $1,537,224. This sum, capitalized at 7 per cent, would call for a value of $21,960,343.

The city engineer in 1921 also made a valuation of the property, using as a basis the detailed inventory which the commission's engineer has prepared, but brought up to date. The unit prices applied to this inventory were averages for the five-year period from 1913 to 1917. This, in the main, Dr. Wilcox says, meant pre-war prices, modified to some extent by the upward trend of the last two years of that period. On this basis the city engineer obtained a reproduction cost new value of $35,273,442. On the basis of a 75 per cent condition, i.e., a deduction of 25 per cent for depreciation, the value became $26,366,366. This historical reproduction cost figure as brought up to date by Dr. Wilcox by additions to capital, but with 30 per cent allowed for depreciation, becomes $25,909,421.

In 1920, when the city engineer (Mr. O'Shaughnessy) valued the property, he reported to the Mayor and Board of Supervisors that a conservative estimate of the reproduction cost of the property, less depreciation, was not less than $35,000,000, and gave $40,000,000 as a fair price for the city to pay for all of the properties, including the suburban lines. Dr. Wilcox thinks that subsequent events, such as decrease in the rate of traffic development expected, increase in operating expenses and continuance of the 5-cent fare, have had the effect of eliminating all franchise value from the picture. Material prices are also much lower than in 1920, but labor costs are not less. Based on comparisons between historical reproduction new in 1921 and reproduction costs new in 1927, as determined in Los Angeles, Dr. Wilcox estimates the Jan. 1, 1927, reproduction costs new of the Market Street Railway property at $44,756,188. With a deduction of 30 per cent for depreciation, this figure would become $31,329,322.

Dr. Wilcox finds the system, as street railways go, a good property and maintained in good operating condition, but containing considerable "deadwood." By this he means a number of poorly paying lines, kept in service for one reason or another. If the city should take over the property, he thinks it would be a mistake to retain many of these lines in operation.

Last year the Market Street Railway carried 198,030,769 revenue passengers, slightly fewer than in 1925, but more than in 1924, and 6,000,000 more than in 1922, the first full year of operation after the company acquired the properties of its predecessor, the United Railroads. It is paying interest on about $12,000,000 of bonds, but has paid no dividends since 1923. In the opinion of Dr. Wilcox, the company apparently could go on operating as at present under a 5-cent fare and still maintain its solvency for an indefinite period, provided it could hold its wage rate at the present level and its present traffic against the inroads of the municipal railway competition, and could continue its present policy of building no extensions. But if it paid the wages that the municipal lines pay, he thinks its operations would immediately show a deficit before charges.

The testimony of Dr. Wilcox on what the municipal road has done under a 5-cent fare is particularly interesting. The first unit of the municipal railway was placed in operation Dec. 28, 1912. The system now embraces 64.55 miles of track in sole ownership and operation, 5.15 miles of track operated and jointly owned with the Market Street Railway and 4.42 miles of spurs and carhouse track. It owns 224 passenger cars and nineteen buses.

Its total fixed property investment as of June 30, 1927, was $8,969,134, representing the actual cost new of the property, exclusive of materials, supplies and other current assets. Of this amount $300,000 represents funds contributed from taxes and the payment of interest, election and other costs, incidental to the launching of the enterprise. For the balance of the investment, about $8,670,000, the system is now indebted in the amount of $3,295,000 of bonds outstanding. Some of the rest of the original costs have been provided from the earnings, either through original construction or through the subsequent amortization of bond issues. The amount actually provided for accrued depreciation is $3,117,536; of this amount $82,405 has been used for retirements, the balance for new construction.

During the 14½ years of existence its operating revenue and interest income has amounted in the aggregate to $36,088,461. After the deduction of operating expenses and bond interest charges the actual surplus left is $2,834,939. This figure does not include any allowance for taxes, though the city is required by charter to set up for the system "comparison charges" for taxes it is not required to pay, but would have been paid if the system had been operated by a private corporation. These charges amount during the period in question to $3,148,672. With this item charged against earnings the nominal deficit of the municipal railway would be $313,733 for the 14½ years. The author says: "No competent investigator, not blinded by prejudice, could deny that the Municipal Railway of San Francisco has achieved notable financial success under the 5-cent fare. If the municipal railway had been less favorably managed in the past and now had to pay interest on a debt equal to the cost of the property, less the depreciation provided, its interest charges for the last fiscal year would have been $113,000 greater than they were. Also, the municipal railway has increased the wages of its employees, giving them an annual two weeks vacation with pay and provided for employees' pensions, until it can no longer be said that street railway men under the standard established by the city of San Francisco are being exploited either for the sake of profits or in the interest of maintaining a low fare for the benefit of car riders." He thinks, however, that only by substantial economics in the future can this wage scale and the 5-cent fare be retained on the municipal railway and suggests that future amortization of capital be cared for by a special tax on land benefited by good transportation service.

Recommends Cash Offers for Both Lines

Dr. Wilcox's recommendation for the California Street Cable Railroad is that it should be notified that the city will not renew its franchises beyond their expiration date of Feb. 17, 1929, but will give the company $1,000,000 for its operative property, "or in the alternative, the estimated actual cost of the existing units of useful and necessary property other than land, less the depreciation accrued therein from all causes, to be determined by the Railroad Commission as the historical reproduction cost of the structural property, less de-

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preciation, exclusive of paving, plus the present market value of the land at Hyde and California Streets, as fixed by the Stafford appraisal."

For the Market Street Railway, he recommends the city notify that company that it will not renew any of its franchises when they expire, and that after Sept. 20, 1929, it will not permit continued operation by the company of the lines on which its franchises have expired. This company should be offered $20,000,000 for its operative property, within the city and county of San Francisco, including lines under lease and controlled through stock ownership, "or in the alternative, the estimated actual cost of the existing units of useful and necessary property other than land, less the depreciation accrued therein from all causes, to be determined by the Railroad Commission as the historical reproduction cost method" with deductions and additions as in the previous case. If the company declines to accept either of these alternatives, the city, subject to the approval of the voters, would require the companies to cease operation on the sections whose franchises have expired and to remove its tracks. The city would then take immediate steps to build extensions of the municipal railway on those routes where the city wished operation continued. It would also acquire joint interest on all track still owned by the company, under unexpired franchises, on streets chosen for extensions of the municipal railway.

W., B. & A. Electric Railroad Conducts Prize Quiz

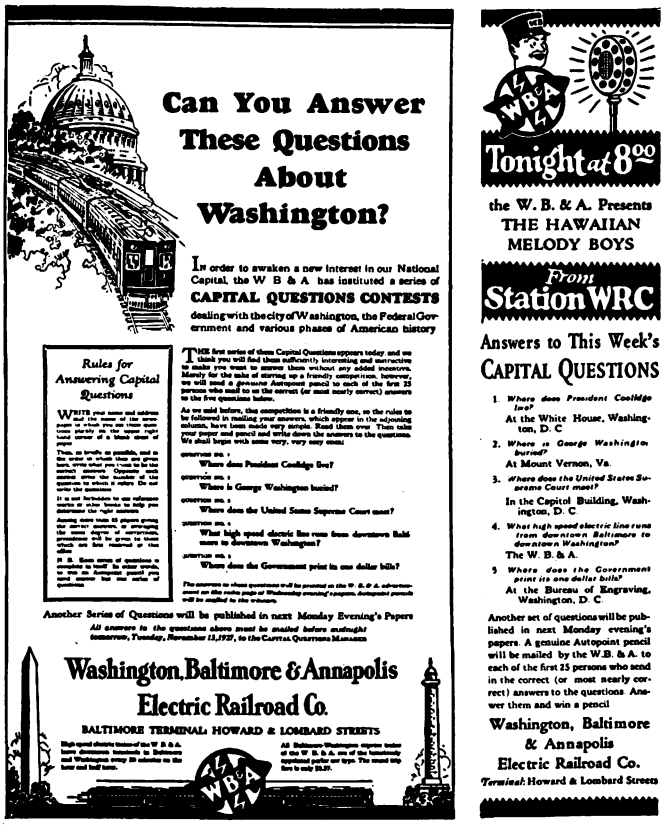
By H. T. Connolly
General Manager Washington, Baltimore & Annapolis Railroad Baltimore, Md.

ONCE more the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., has hit on a novel way of calling attention to itself and its services. The W., B. & A.'s latest idea is to arouse among the people of Baltimore an interest in the various show places of Washington (40 miles distant) by the simple device of asking questions and by offering a few prizes for correct answers. The prizes are modest; they are enameled, metallic pencils. The railway's advertisements have stressed the prizes as little as possible.

The aim is not so much to inspire an increase of tourist traffic from Baltimore to Washington as to associate the ideas of Washington and the W., B. & A. in the minds of all who read the advertisements. This is important, because the road is in active competition for passengers with two steam railroads and a motor coach line.

The questions appear in series of five. The first appeared in the Baltimore evening newspapers of Nov. 14. Simultaneously a letter was sent to school teachers asking them to call the attention of their history and civics classes to the contest. All the questions were as simple and easy as it was possible to make them. All but one suggested some place in Washington worth visiting and that one suggested the means of doing it. Where does President Coolidge live? Where is George Washington buried? Where does the United States Supreme Court meet? Where does the government print its one dollar bills? What high-speed electric line runs from down-town Baltimore to down-town Washington?

A few minutes after the earliest editions of the newspapers had appeared the first set of answers was delivered by the contestant in person. The next day's mail brought more than 500 answers. It had been anticipated that nearly all would be from school children, but a remarkably large number were from adults. It had also been anticipated that the great majority would answer all five questions correctly and notice had been given that, since only 25 pencils were available for distribution, priority would be given to the papers received in the first mail. But though the number of correct papers was well above 25, many others were amusingly inaccurate. It was very significant, however, that all



W., B. & A. advertising in Baltimore papers gave the questions and two days later the answers to the queries along with the regular radio program

knew how to get to Washington by electric train, though, to be sure, this information had been given gratis in the signature of the advertisement.

As far as could be determined, the contestants represented a wide variety of ages, intelligence and social grades. All papers were acknowledged and those who failed to win were invited to try again. To the winners the company sent with the prizes short letters of congratulation. The correct answers were published two days later, concurrently with the program of a radio concert to be broadcast that evening by the W., B. & A. from the Washington station, WRC, in a weekly series which has been conducted for several months with excellent effect. On Wednesday evenings they have been providing homes within reach of station WRC with 30-minute musical performances by the best talent available. Between numbers, the announcer calls attention to one or another advantage of the W., B. & A. service.

The second series of questions was published in the newspapers of Nov. 21. This time the questions concerned the National Zoo, the Library of Congress and the new National Cathedral. Although at the time of writing the returns from this second advertisement had not been tabulated, it was apparent that interest had increased rather than diminished.

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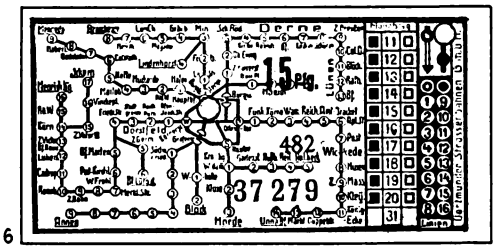

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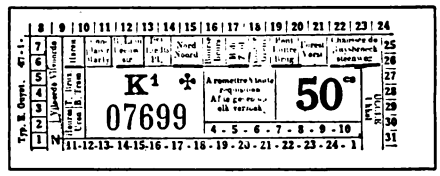

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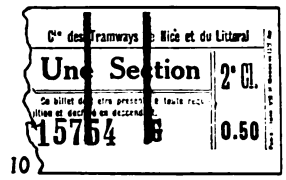

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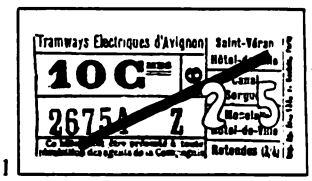

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Fronts and backs of various European tickets or fare receipts

In the group above, Nos. 1 to 5 and Nos. 13 to 16 show the backs of tickets, and the others the fronts. The backs, on many European lines, are sold for advertising. No. 1 is from Nice, Nos. 2, 5, 13 and 16 from London, 3 is from Amsterdam, 4 is from Brussels, 14 is from Lido, and 15 from Milan. As will be seen the articles advertised are varied, including clothes, candy, tobacco, furniture, beer, and medicine for the baby. Fronts of tickets are shown as follows: 6 from Dortmund, Germany, 7 from Brussels, 8 from Naples, 9 and 10 from Nice, 11 from Avignon, and 12 from Milan. Especially interesting features in these tickets shown are as follows: In 6, the map of the system for easy punch of destination; in 7, the printing of all names in two languages, French and Flemish; in 9, the issue of a "supplement," or extra fare, when a passenger changes from second to first class, and 11, a surcharged ticket, showing an increase in fare from 10 to 25 centimes.

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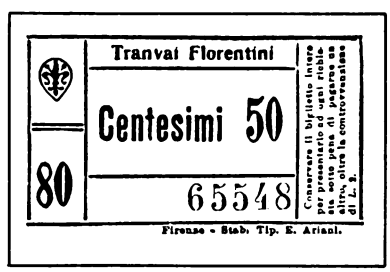

The lower group shows other European street railway tickets or fare receipts. In this group only the fronts of the tickets are shown.

It will be noticed that the rate of fare is distinctly printed on the face of the ticket. Those in the left hand column are from Amsterdam, Lugano, and Milan. That above, in the center, is from Florence. Those in the right hand column are from Rome, Lido, and The Hague.

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Fares and Fare Collection

in Europe

Some lines charge zone fares, others flat fares. The fare receipt is common, but fare boxes are used on one-man cars. London County Council is pioneering in mid-day fare reductions

By Henry W. Blake
Senior Editor *Electric Railway Journal*

Berlin commutation tickets

Many of the street railway lines in Europe sell tickets for any number of rides within a specified period, good either over the entire system or only over certain routes. The two reproductions in the center are front and back of a monthly commutation ticket, good over the elevated and underground railway and also the surface lines in Berlin. Payments are made monthly for six months, and their receipt is shown by stamps pasted over the squares on the back and canceled. The ticket at the left is sold at a reduced price to students. That at the right is for the surface lines only. All of these tickets require the photograph and signature of the person to whom issued; that is, they are non-transferable. The word "Muster" simply means "sample."

ELECTRIC railway and bus fares are lower in the large cities in western Europe than in the United States, but as a rule the average ride is much shorter than here, and no transfers are given. Berlin is an exception to this rule about transfers, as it gives one transfer for its flat 5-cent fare and puts a time limit on the trip. It should also be remembered that the labor costs of electric railway and bus operation are much lower in Europe than in America. Particulars on this point were given in an article by the writer in ELECTRIC RAILWAY JOURNAL for Aug. 27.

Practice in European street railway and bus fares divides between the zone fare and the flat fare. A report presented at the 1924 convention of the Internationaler Strassen- und Kleinbahn Verein and published in abstract in the issue of this paper for Nov. 29, 1924, showed that on the 47 city roads of Central Europe which reported 22 had flat fares and 25 some form of zone fare.

The same variation is found in the largest cities. Thus, all lines in London, the bus and surface railway lines in Paris and the surface lines in Brussels charge fares on the zone system, but the rapid transit lines in Paris, all lines in Berlin, the railway and bus lines in Milan, Florence and Rome and the trolley in Amsterdam charge a flat fare. The flat fare rate in the spring of this year in the cities mentioned, expressed approximately in American currency, follows: Berlin, 5 cents; Amsterdam, 4 cents; Milan and Florence, 2½ cents; Paris rapid transit lines, 2.4 cents for second class and 4 cents for first class; Rome, on most lines, 2½ cents on weekdays and 3 cents on Sundays, but on two long lines, 4 cents on weekdays and 4½ cents on Sundays.

Under a recent agreement made in Berlin between the city of Berlin and the State Railway System a flat fare will be established between the Berlin Stadtbahn system on one hand and the rapid transit, street railway and bus system on the other. The Stadtbahn, as will be remembered in an article which was published in this journal in the issues of Nov. 5 and Nov. 26, is a part of the State Railway System, on which considerable local transit business is done. It is now being electrically equipped for 800-volt d.c. operation. On the payment of a flat 30-pfennig fare, passengers will receive a free transfer from

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the Stadtbahn or Ringbahn or from any section of the suburban lines (or Vorortbahnen) to any one of the municipally owned lines mentioned. Later, a half-fare rate for children may be introduced.

The minimum fare per zone for surface lines charging zone fares often varies, as shown in the table on page 1069, reproduced from the posted notice of the Vitry-Concorde line in Paris, being sometimes 35 centimes and sometimes 50 centimes (50 centimes = 2 cents). The same schedule also shows higher rates for first class passengers, a special fare schedule for workmen's return tickets and two schedules for cripples, depending on the extent of their injuries. "Cripples" (*mutilés*) as used here means primarily soldiers crippled during the war. Each car carries a table of this kind, applying to the points reached.

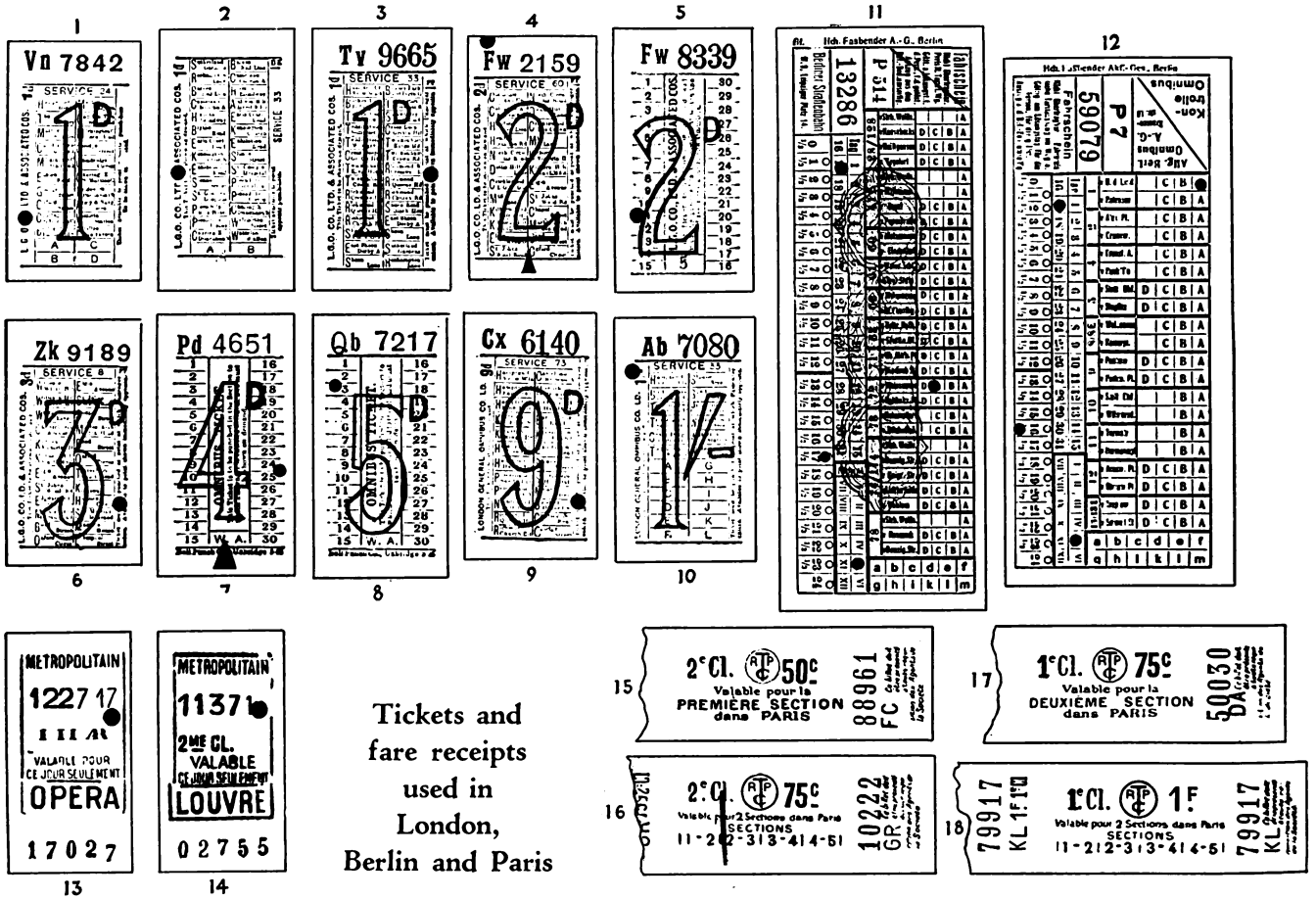
On the Paris bus lines the fare in the first zone is usually 2 cents for second class and 3 cents for first class, with 3 cents and 4 cents respectively for two zones and 4 and 5 cents for more than two zones. The Paris bus lines also have reduced rates for the same classes favored with lower rates by the surface lines.

All Paris trolley and bus fares are based on a higher charge for the initial zone than for each succeeding zone. In London, however, the trolley and bus fares are directly proportional to the distance traveled, so far as this can be done with the policy followed of having the zones end at logical traffic points. These London fares are approximately a penny for about 1¼ miles on the London County Council tramway lines and a penny a mile for the buses.

In addition, the London County Council Tramways has had in force also for several years reduced flat fares, particularly in the middle of the day. Thus, it sells from Monday to Friday for 2 pence a ticket which is good for any distance and is accepted on cars which leave their London (or downtown) termini between 9:30 a.m. and 4 p.m. and on those which arrive at the downtown termini between 10:30 a.m. and 5 p.m. In other words, these time limits are so set as to give the greatest leeway when the passenger goes against the main trend of travel. This 2-penny fare accounts for about 5 per cent of the daily revenue. It is now proposed to sell these tickets on Sunday also.

Other Bargain Fares in London

The London County Council also issues a 1-shilling day pass, good on any day. Originally, this pass was issued on Saturdays and Sundays only, but its use was extended to every day during 1925. On a recent bank holiday 20,000 of these passes were issued at 1 shilling each, making the receipts from this pass amount to approximately 6 per cent of the total receipts, which were about £16,000. Within the last few months the County



Tickets from 1 to 10 are reproductions of fronts and backs of tickets issued by the London General Omnibus Company. They represent trips for which charges are made varying from one penny to 1 shilling. As a rule the zone points are named on the ticket, being arranged in double column in such an order that one punch indicates both termini. Sometimes letters or numbers only are used, especially where a large number of zone points would have to be listed.

No. 11 shows a combined fare receipt and transfer ticket issued by the Berlin Surface Lines. It is punched for the day, hour and issuing route. The letters in the lower right hand corner are punched by the conductor of the car to which transfer is made. No. 12 is a corresponding ticket issued by the Berlin General Omnibus Company.

Nos. 13 and 14 are tickets issued by the Metropolitan (rapid transit) Railway in Paris. They are issued by a machine and carry the hour and day of issue, class and name of issuing station. Though a flat fare is charged in each class, tickets are employed to identify the class used.

Nos. 15 and 16 are second-class tickets, one for one section, and one for two sections, issued by the S.T.C.R.P., which operates the surface cars and buses in Paris. Nos. 17 and 18 are the same, but are good for first-class accommodations.

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Council Tramways has been issuing a similar pass for children at half price, or 6 pence, but the pass is limited to the four months from June to September.

Besides these fares, the L.C.C., like most of the other tramways in Europe, issues a workingman's ticket. This ticket, which is sold to any one who applies for it on the cars before 8 a.m., is a round-trip ticket good for return at any time during the day, for the price of a single fare. On the London County Council lines there is a minimum charge for this ticket of 2 pence. Then there is the ordinary return fare ticket, good on certain lines and sold at the rate of 5 pence for two single 3-penny rides; 6 pence for two 4-penny rides and 8 pence for two single 5-penny rides. There are in addition to the 2-penny flat-fare mid-day tickets the 1-shilling transferable one-day pass and the 6-penny children's one-day pass already mentioned. The London County Council management has been very successful in merchandising these different rates of fare and has tickets to fit practically each combination desired.

As explained, the London single car fare of 1¼ miles for a penny is somewhat less than the London bus fare, which is based on a mile for a penny. Elsewhere in Europe, also, the trolley fare usually is somewhat less than the bus fare, or else for the same fare a longer ride is given by trolley than by bus. Berlin is an exception, the same flat fare (20 pfennigs) being charged on bus, trolley and rapid transit lines with liberal transfer arrangements, but electric railway operation is considered less expensive there than bus operation and the trolley lines are paying a good profit. The large surplus from Berlin trolley operation is used to finance the construction of the rapid transit lines, as both are owned by the municipality.

Incidentally, it might be added that in every city visited by the writer during a recent trip on the Continent, where the bus system and trolley system were operated by the same interests, the trolley was pronounced by the management the more economical per passenger carried and better suited for mass transportation.

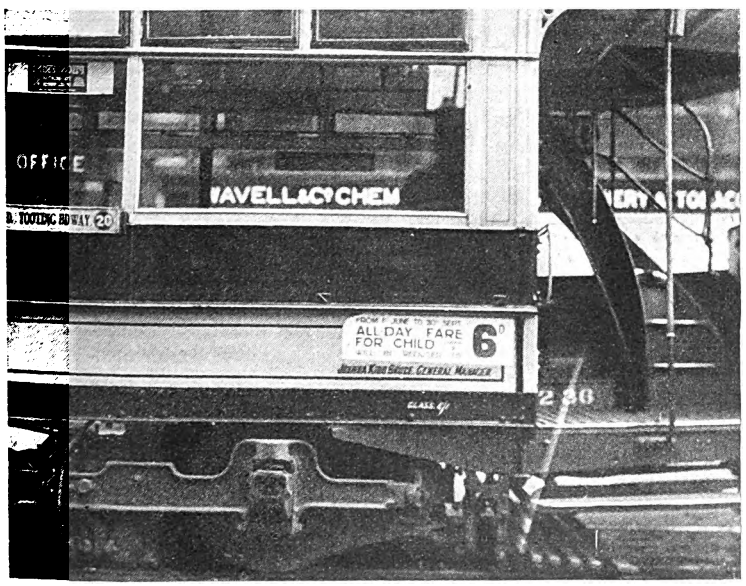
Most European electric railways issue season tickets or passes for one week, one month, three months, six months, or (as in Zurich) for a year. These tickets are not transferable like our weekly passes, but can be used only by the person whose name (and sometimes photograph) appears on the card. The charge for these season tickets varies with the number of routes over which they are available. An extended account of the varieties of tickets of this kind sold by the roads in Central Europe will be found in the article already mentioned on page 924 of the issue of this paper for Nov. 29, 1924. Where such commutation tickets are issued the road also usually sells a school commutation ticket at a lower price. Some Berlin monthly school tickets are reproduced. A permit card is also issued to scholars between fourteen and eighteen years old, allowing them to ride at the children's rate.

Advertisement on the back of the tickets of one of the bus lines running out of Monte Carlo

Fare Collection

The almost universal method of fare collection on both street railways and buses is for the conductor to make a trip through the car after each stop and collect fares by hand from the passengers who boarded the car. For each fare collected he issues a receipt, torn serially from a pad, of which the conductor carries several, one for each rate of fare and direction. The conductor's accounts are audited by the number of tickets remaining in the pads issued to him when he started his work.

Where there are many rates of fare, as on a number of the London bus lines where the fares may range by half-penny gradations from a penny to a shilling, the



British managers advertise bargain rates on their cars

The paster at the left tells about the new rate brought out by the London County Council, i.e., a 6d. daily pass for children. The paster at the right advertises the flat 2d. fare good for any distance during the middle of the day on weekdays on the London County Council Tramways.

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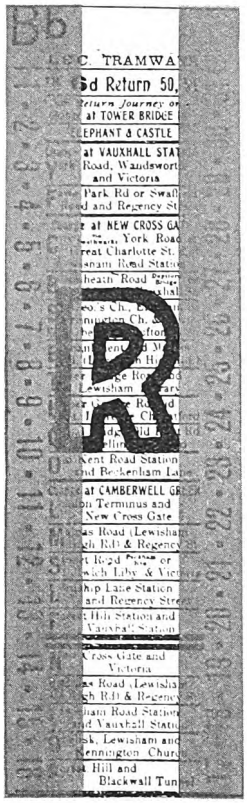

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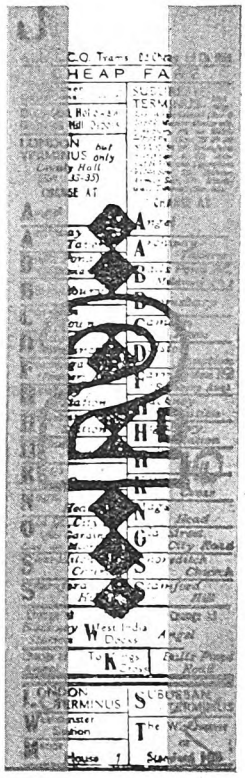

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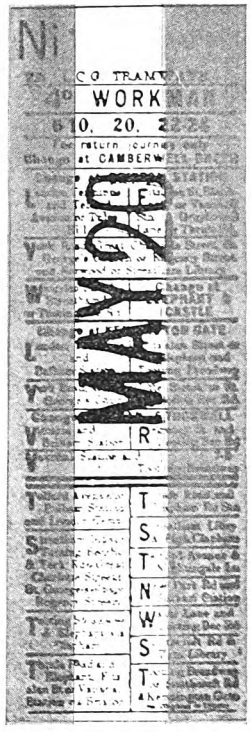

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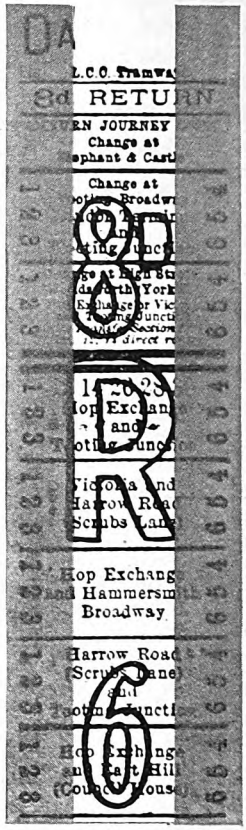

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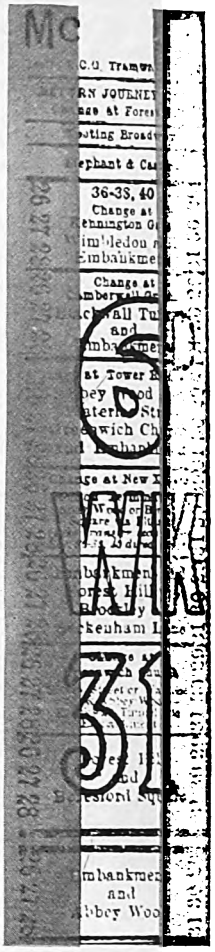

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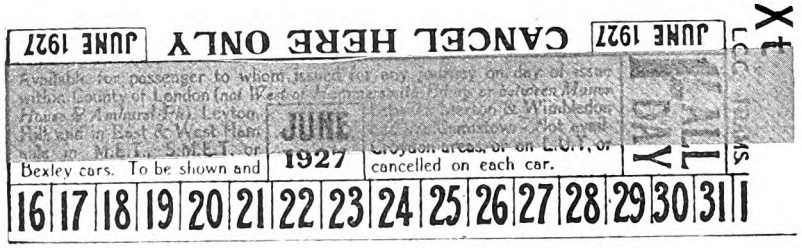

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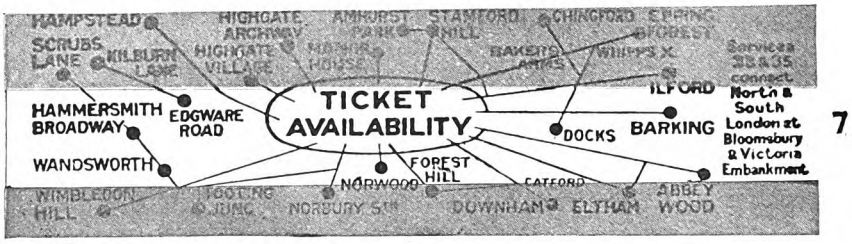

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Special Tickets of London County Council Tramways

Regular fares on the London County Council Tramways are on the zone system, with a charge of approximately 1d. (2 cents) for 1¼ miles. A number of special cut-rate tickets are issued, however, for various kinds of journeys. Several are illustrated above.

The first (No. 1) is a 6d. return ticket, good at any time during the day for a ride where the single fare would be 4d. The procedure on these lines for the issue and cancellation of return tickets is, briefly, with the exception of emergency tickets, as follows:

At time of issue, if the journey can be made without a transfer, the destination is punched in the lower part of the ticket below the double line. If the journey requires a transfer, the issuing conductor punches the transfer point above the double line, while the conductor on the second car, if it will take the passenger to his destination, punches the ticket below the double line on the same edge of the ticket as the cancellation of the first conductor. In other words, one cancellation below the double line indicates the ticket has been presented to the conductor on a car which will take the passenger to his destination on his outgoing trip.

The practice described is followed on the return trip, namely, for direct journeys cancellation is made below the double line and transfer journeys above the double line, with final punch below the double line made by the conductor on the last car used. Two punches below the double line mean cancellation of the ticket. The date is punched in the margin, in the space provided for it.

Ticket No. 2 is the famous 2d. flat midday fare. This ticket is good for any distance on cars leaving central London between 9:30 a.m. and 4 p.m. or on cars reaching central London between 10:30 a.m. and 5 p.m. Transfers are permitted and the same system is followed as with the No. 1 ticket, the conductor on the final car punching the ticket below the double line.

Ticket No. 3 is a 4d. workman's return ticket, not greatly different in form from the 6d. return ticket already described, but sold at a reduced rate because the going trip is taken before 8 a.m.

Tickets Nos. 4 and 5 are respectively 8d. and 6d. return tickets of a somewhat different type than the ones already shown, particularly in the method of indicating the date of issue. They are printed for six consecutive week days, the day of the month being punched by the conductor.

Nos. 6 and 7 are front and back of the 1s. all-day pass. These passes are printed good for one-half a month, and the day of issue is punched in one margin. Every time the pass is used, the conductor makes a punch in the canceling margin. The back of the ticket shows the routes over which the ticket is available. These include not only all the lines of the London County Council, but by agreement with certain connecting municipal lines it is good over those lines also.

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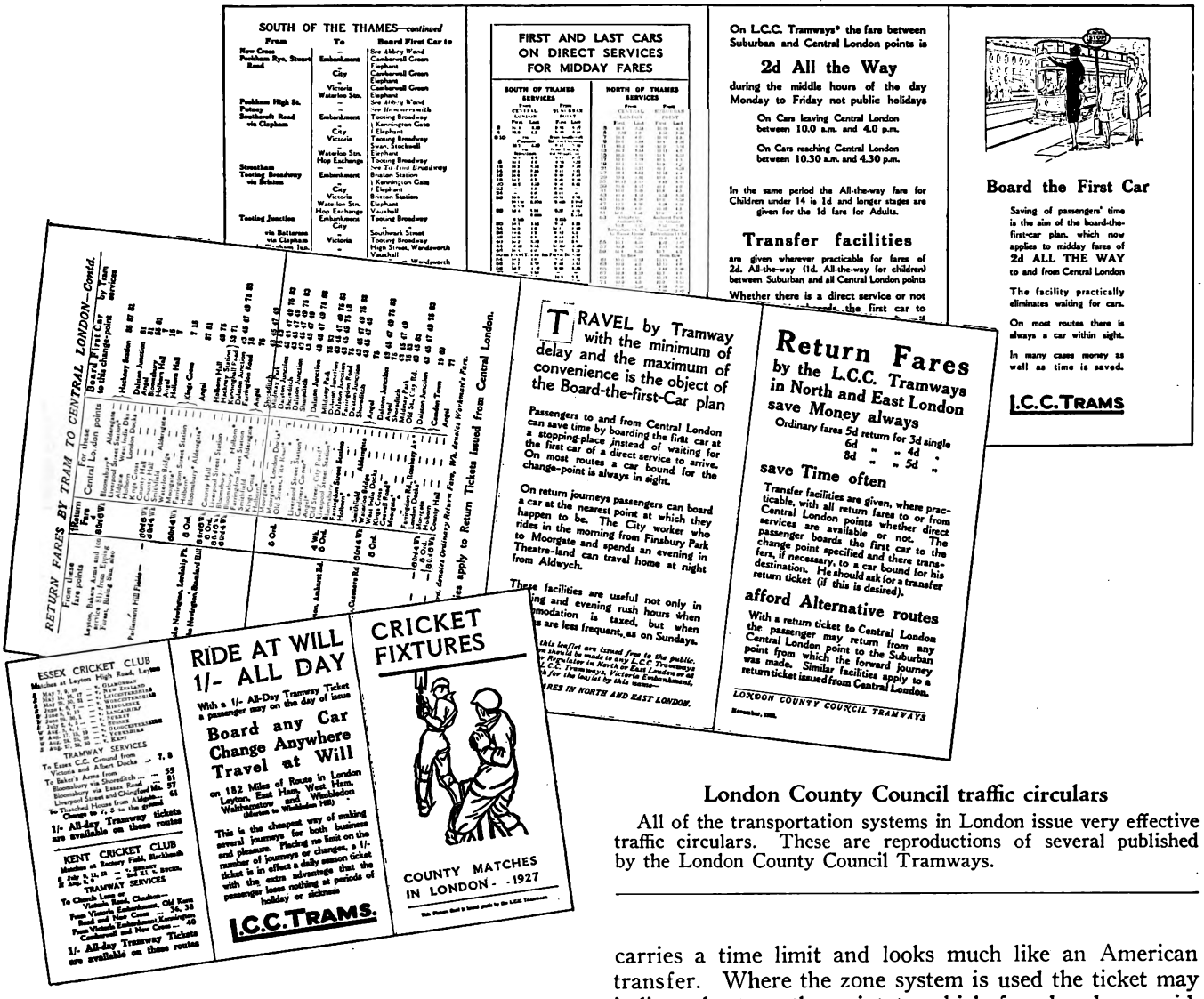

London County Council traffic circulars

All of the transportation systems in London issue very effective traffic circulars. These are reproductions of several published by the London County Council Tramways.

number of pads of tickets which a conductor has to carry is quite large. The supply of these tickets which is required in the stockrooms of the company is correspondingly large. Sometimes the number carried by the conductor is reduced by having him punch the rate, but as another alternative the London General Omnibus Company is trying on one line a ticket-issuing machine. It is swung around the neck of the conductor, just as the customary bell punch is carried. It weighs 4 lb. instead of 2 lb. for the punch.

Often the space on the back of the ticket (or fare receipt) is sold for advertising purposes, thereby bringing in a considerable revenue. The aptness of some of this advertising is illustrated by the reproduction of the back of the bus ticket between Nice and Monte Carlo. It shows a man whose pockets are empty, but whose woman companion says that the pawnbroker Maxima "will advance us some more money on our jewelry."

Every passenger by train or bus is expected to get a receipt for the fare paid by him and to hold it until he finishes his trip. Inspectors occasionally board the car or bus to see that all passengers have fare receipts. When the passenger leaves the car he may throw his receipt away, either on the car floor or on the street.

The form of this kind of receipt is very simple on flat-fare lines which give no transfers, as will be seen from the Italian tickets reproduced. Where a transfer is permitted for the fare paid, as in Berlin, the ticket carries a time limit and looks much like an American transfer. Where the zone system is used the ticket may indicate by type the point to which fare has been paid, as in London and Brussels, or by a map of the system, as in Dortmund, or it may simply carry the words that it covers a certain section or number of sections, as in Paris.

The London General Omnibus Company follows an ingenious method of arranging the names of the different zone limits on its fare receipts so that the conductor indicates both the boarding point and the point to which fare has been paid by a single cancellation. Sometimes the punches used are of the magazine type so as to give another check on the number of tickets issued by the conductor.

A feature of every ticket sold, and this applies to steam railroad tickets in Europe as well, is that it carries distinctly on its face the price at which it is sold. This is usually printed, but occasionally may be punched. This is undoubtedly a great convenience to the traveler and a plan which steam railroads here could copy to advantage. A few railroads print the price on the ticket, as does the Pullman Company, but except for these the purchaser of a railroad ticket in the United States can never be sure that he is not being short-changed, unless he knows the proper charge for his ticket or goes to the trouble of looking it up.

The one-man cars in Amsterdam were the only ones seen by the writer on his recent trip which were equipped with fare boxes.

The rapid transit lines follow the same practice of

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issuing fare receipts, except that where a zone fare is charged the passenger on leaving the station surrenders his ticket to a station guard, who thereby can check him to see that he has not overridden.

On the flat-fare Paris rapid transit lines tickets are not necessary for this purpose, but are issued to indicate whether the fare paid entitles the passenger to ride in a first-class or second-class car. Ticket-issuing machines are employed, and different colors indicate the two classes. Each ticket is stamped with the time it was issued as well as the name of the issuing station, so it cannot be used a second time.

As there need be no check on overriding on this flat-fare line, the Paris rapid transit passenger is not obliged to surrender his ticket at the end of his trip, but to prevent the stations from being littered with tickets wire baskets are provided near the entrances, into which those leaving the station can throw their used tickets if they wish to. Occasionally baskets of this kind will be seen at important unloading points on surface lines, but they are not common.

On the Berlin rapid transit lines, as explained, the fare receipt issued is very similar in appearance to that used on the Berlin bus and street railway lines. In May of this year, however, the company was experimenting with several ticket-issuing machines.

On the zone fare rapid transit lines in London each ticket not only names the station on the direct line to which the passenger may ride for the fare paid, but also names all the limiting stations on all the connecting lines to which the fare paid entitles the passenger to ride. On a 6-penny ticket this means a larger number of stations.

Most of the London rapid transit stations are equipped with "penny-in-the slot" ticket-issuing machines, from which passengers with the exact change can secure the ticket they want. Thus one machine will issue 1½-penny tickets, another a 2-penny ticket, etc.

Reason for Issue of Fare Receipts

It may appear strange to Americans that European flat-fare lines continue to use a system such as the fare receipt, which has several conspicuous disadvantages as compared with the fare box. One of these is the expense of printing the receipts, though this is sometimes covered, as explained, by the sale of advertising space on the back. Another objection is the expense of inspectors. Another is the litter in the car and on the street caused by discarded tickets. It will appear also to most American managers that the system is slower and more open to abuse by both passengers and conductors than the fare box, though European managers deny this to be the case on their roads.

For zone fare lines there are certain advantages which call for the retention of the fare receipt, as it does afford a definite way of indicating the point where a passenger boards the car or bus and the distance which he is entitled to ride. This is especially useful where the fare zones are short, as they are in Europe.

Probably the main reason for the use of the fare receipt on flat-fare lines is that the public is accustomed to it, both because many of these flat-fare lines formerly charged zone fares and because the fare receipt is in general use in neighboring cities. However, it is not very practicable with one-man car operation, and if that method should spread in Europe the fare box would undoubtedly be more widely adopted. Already the managements of some flat-fare lines are considering the fare box seriously.

As will be seen, the fare system in Europe is by no means standardized. Beside it the straight fare charged in most American cities is simplicity itself. In Europe each system seems to have worked out its fare system independently. Part of the variation is due to law. The low workmen's fare in most cities is an instance. Part can be attributed to compromises made with the city authorities when permission for an increase in fare was obtained. Part has been caused by the spur of competition. In London this competition has been between the city-owned trolley cars on one side and the privately owned buses and rapid transit lines on the other. In all the cut rates put in, however, the great traffic advantage has been sought of giving the reduced rate, so far as possible, only during the non-rush hours or in the direction contrary to the main flow of traffic.

Keeping passengers in line

In Paris a box containing a pad of tickets for queue formation in boarding cars or buses is attached to this standard, upon which is also a stop sign for street cars and buses. A sample queue ticket is shown in the lower left-hand corner.

In America the principal, indeed the only, competitors ever considered are the jitney and the privately owned automobile. Neither of these is a serious factor in Europe, owing to the small proportion of the population which owns cars. It is another matter, however, with bicycles. Especially on the continent of Europe bicycles are a very common sight on city streets, but perhaps more so in Italy and Holland than in France, Germany or Belgium. It is said that in Amsterdam, which is a city of 800,000 inhabitants, there are 200,000 bicycles, and any one who sees them crowd the streets in the downtown

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SECTIONS ET TARIFS

De VITRY (Église) à :	1re Cl.	2e Cl.	Ouvriers 2e cl.	Mutilés	MUTILÉS 100 %
VITRY (Gare)	0 50	0 35	0 50	0 35	0 30
IVRY (Place Gambetta)	0 75	0 80	0 60	0 35	0 30
PORTE DE LA GARE	1 10	0 85	0 85	0 70	0 30
PONT D'AUSTERLITZ	1 85	1 35	1 45	1 05	0 65
SAINT-GERMAIN-DES-PRÉS	2 10	1 60	1 70	1 05	0 65
PLACE DE LA CONCORDE	2 35	1 85	1 85	1 20	0 80
De VITRY (Gare) à :					
IVRY (Place Gambetta)	0 50	0 35	0 50	0 35	0 30
PORTE DE LA GARE	0 75	0 60	0 75	0 50	0 30
PONT D'AUSTERLITZ	1 50	1 10	1 25	0 85	0 65
SAINT-GERMAIN-DES-PRÉS	1 75	1 35	1 50	0 85	0 65
PLACE DE LA CONCORDE	2 »	1 60	1 75	1 »	0 80

D'IVRY (Place Gambetta) à :	1re Cl.	2e Cl.	Ouvriers 2e cl.	Mutilés	MUTILÉS 100 %
PORTE DE LA GARE	0 50	0 35	0 50	0 35	0 30
PONT D'AUSTERLITZ	1 25	0 85	1 »	0 70	0 65
SAINT-GERMAIN-DES-PRÉS	1 50	1 10	1 25	0 70	0 65
PLACE DE LA CONCORDE	1 75	1 35	1 50	0 85	0 80
De la PORTE DE LA GARE à :					
PONT D'AUSTERLITZ	0 75	0 50	0 60	0 35	0 35
SAINT-GERMAIN-DES-PRÉS	1 »	0 75	0 85	0 35	0 35
PLACE DE LA CONCORDE	1 25	1 »	1 »	0 50	0 50
Du PONT D'AUSTERLITZ à :					
SAINT-GERMAIN-DES-PRÉS	0 75	0 50	0 60	0 35	0 35
PLACE DE LA CONCORDE	1 »	0 75	0 85	0 35	0 35
De St-GERMAIN-DES-PRÉS à :					
PLACE DE LA CONCORDE	0 75	0 50	0 60	0 35	0 35

Tables of this kind are posted in all Paris cars

They vary according to the route traversed, showing the fares between different zone points. Notice the difference in fares between regular passengers, workmen, cripples and completely disabled soldiers. The workmen's fares quoted are for a round trip.

section between 8:30 and 9 a.m. will have little difficulty in believing that such a high ratio is correct. In all the continental European capitals they form a serious competitor to the bus and electric car.

Tickets for Queue Formation in Paris

Before the subject of electric railway and bus tickets is dismissed a short reference should be made to the tickets for queue formation used in Paris. At the more important car and bus stopping points there is a pad containing numbers serially arranged, the pad usually being attached to the post carrying the sign which lists the lines passing that point. This pad is used by passengers only when the cars or buses passing that point are crowded and it is evident that only a limited number of additional passengers can be taken on at the next stop. At such times, as intending passengers arrive at the stopping point, each detaches a number from the pad. The passengers are then admitted to the car or bus in the order of their numbers, the lowest numbers coming first. The only exception to this rule of priority is the published regulation of the company which says:

"La priorité est laissée aux aveugles, mutilés de guerre femmes dans une position intéressante ou portant un enfant sur les bras."

Paris was the only city visited by the writer in which this queue system is in use. Even there some of the transportation officials were skeptical about its desirability, but they said it was continued because the public was accustomed to it. It has been employed there for many years, even during the days when buses and cars in Paris were drawn by horses. A queue ticket is reproduced on page 1068 and a pad of these tickets can be seen attached to the pole in the Paris stop sign, illustrated on the same page.

Operator's Nameplate Put on Fare Box

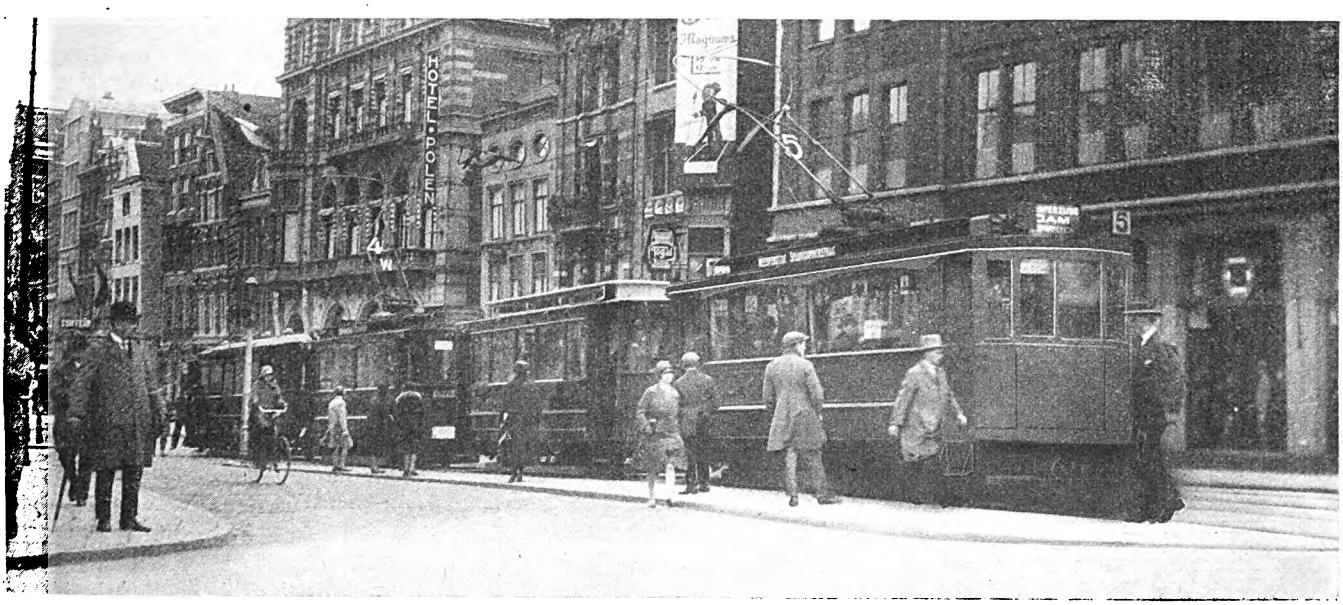
USE of a plate on cars, particularly one-man cars, giving the name of the operator is extending. The practice, of course, is followed also for the clerks serving the public at hotel desks, railroad ticket offices and elsewhere, the thought being that the public likes to know at least the name of the person with whom it is doing business.

Usually the name is painted on a strip of wood which fits into a slide inside the vestibule. The brief of the El Paso Electric Company, El Paso, Tex., presented for the 1927 Coffin Prize discloses that on its railway the name is carried on the fare box.

The nameplates are of brass with polished raised letters. They are about $1\frac{3}{4}$x6 in. long and fit into a special slot on the fare box. Thus the name of the operator is in plain view of all boarding passengers. A light placed over the slot makes the name visible at night.

At first aluminum nameplates were used, but they were discarded in the summer of 1926 in favor of brass plates. It was found that aluminum was not durable enough to withstand the hard usage to which the nameplates are subjected. Being of metal, the plate is not so likely to be mutilated or become unsightly as if of wood, and the highly polished letters of the name can be read easily.

As it is attached to the fare box, the nameplate automatically is always carried at the front end of the car.



Loading platform in the down-town business district of Amsterdam

No traffic is in sight except the street cars and a bicycle. While this absence of street traffic is not a common condition, it is a fact that automobiles are much less in evidence in Amsterdam and other European capitals than in cities of corresponding size in the United States, and that the number of bicycles very much larger.

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Maintenance Methods and Devices

Good Use Found for Obsolete Cars

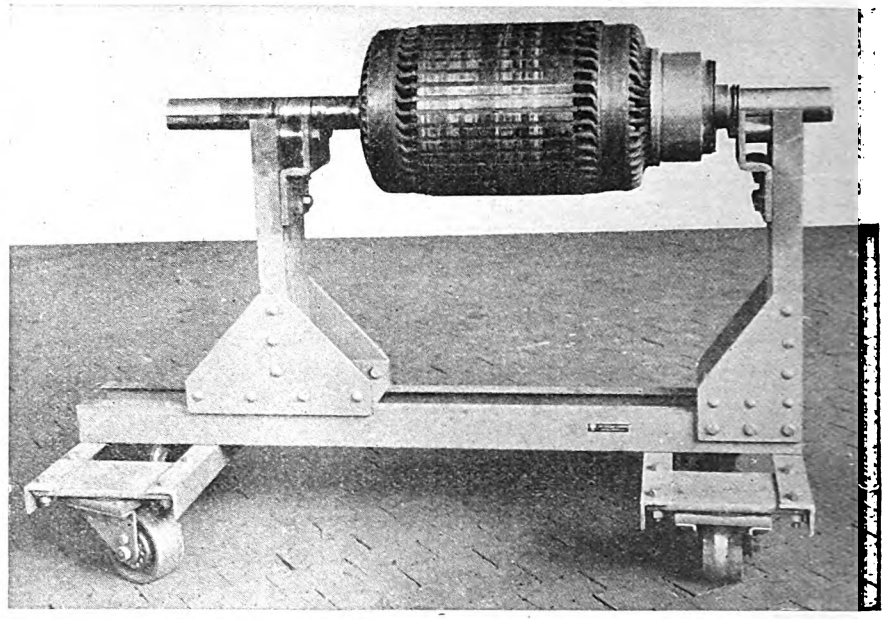
OBSOLETE passenger cars have been put to good use by the Northern Texas Traction Company of Fort Worth, Tex., according to its 1927 Coffin brief. It makes flat cars out of them and uses them to carry gravel. The company owns and operates its own gravel pit. Last year the amount of new construction done was larger than usual and more gravel cars were necessary. It was found that the trucks and brake rigging on two passenger cars about to be discarded were in fair condition, so it made two very serviceable gravel cars out of them by removing the superstructure.

Auxiliary Light for Block Signal

IN ITS brief for the 1927 Coffin Prize the Arkansas Power & Light Company, Little Rock, tells of an attachment to one of its Nachod turnout signals which has been found convenient. This signal is located near the entrance switch from single to double track.

Before the attachment was made the operator of an inbound street car had to look back after he had passed the trolley pan to see that the signal had registered "clear." Sometimes this required him to get off the car to see the signal. Now an auxiliary 110-volt clear lamp has been connected in series with the 110-volt red lamp in the signal so that it will go out when the signal clears. This lamp is mounted within a small box on a pole to the right and in front of the trolley pan. This allows the operator to keep his eyes to the front at all times.

The connection has helped to speed up traffic, and the company is planning to equip all of its signals in the same way.



Portable armature stand with adjustable supporting post

Ball Bearing Adjustable Armature Stand

By Jesse M. Zimmerman
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

CONVENIENCE in handling armatures of railway motors is had by the combination adjustable portable armature stand shown in the accompanying illustration. One post is stationary, while the other can be moved in or out to fit any size of armature. It is locked in position by a wing nut. The four castors have wide wheels so the truck can be moved about over an uneven floor and are equipped with ball bearings. The pivot bearings are also ball bearing so that the castors will turn easily in the direction the truck is being pushed.

The rollers on which the shaft rests are supported on roller bearings. These rollers turn with the shaft, thereby preserving the journal polish. The truck was designed by the equipment and method department at the Homewood Renewal Parts Works of the Westinghouse Electric & Manufacturing Company.

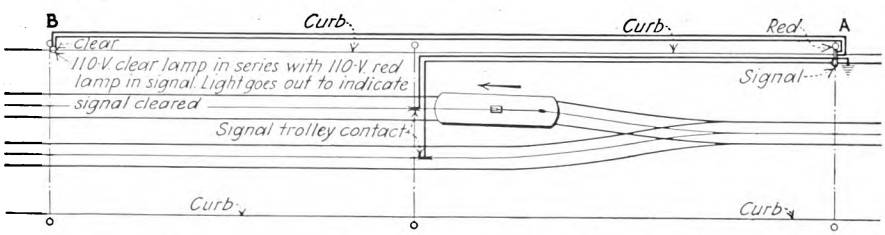


Diagram of connections showing location of auxiliary light to indicate operation of signals

Handling Compressors Pneumatically

REMOVING and installing air compressors was always a slow and tedious job in the Woodside shop of the New York & Queens County Railway, New York City, until a method was adopted to simplify the work. This scheme is shown in the accompanying sketch. Prior to this installation considerable blocking was necessary in order to install or remove a compressor. This blocking is obviated with the new apparatus, which consists of an 8x12-in. brake cylinder installed in the overhauling pit. A 17x24-in. oak platform is fastened to the cylinder piston. Control is by a motorman's valve with necessary piping. The cylinder is bolted to two $\frac{3}{4}$x$2\frac{1}{2}$-in. bars fastened securely to the side wall of the pit and in such a position as to permit the platform to reach the compressor when the piston is near its maximum travel. The platform is designed so

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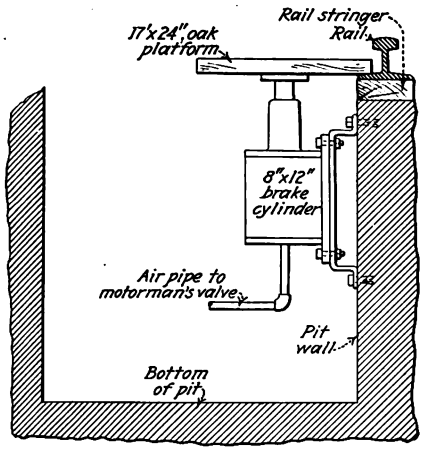


This equipment has provided a means for the quick removal and installation of compressors with a minimum of labor

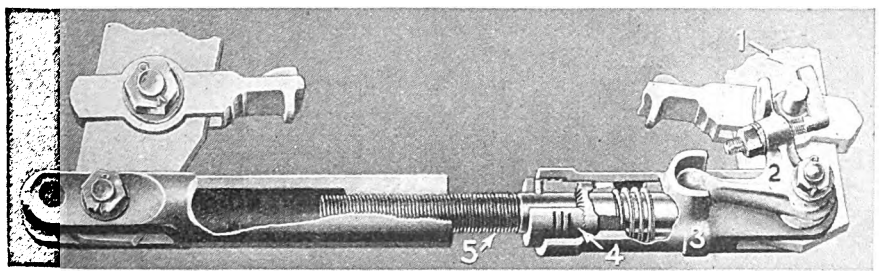
that one side of it will rest upon the rail stringer and below the surface of the rail when the piston is in the full down position. A ¾x2-in. flat bar is installed under the cylinder and fastened to the floor in order to strengthen the installation. The cylinder is operated by a motorman's straight air valve installed on the pit side wall alongside of the cylinder.

To remove a compressor with the new apparatus the car is run to such a position that the compressor is directly over the pneumatic lift. A hand truck is run onto the platform and air is admitted to the cylinder until the truck is lifted into contact with the bottom of the compressor. When the compressor is unbolted the air is released and the truck is returned to the floor level.

New Equipment Available

Improved Type of Slack Adjuster

DEMAND for a device that will function automatically to take up the slack in brake rigging caused the J. G. Brill Company, Philadelphia, Pa., to bring out an improved type of mechanical slack adjuster. This slack adjuster is for installation in the bottom brake rod of a truck. The accompanying illustration shows the various parts. As the brakeshoes wear and the movement of the live lever 1 increases, the adjuster crank 2 on the live lever turns the adjuster housing 3, and with it the sliding ratchet 4, the length of one tooth. As the brakes are released the return movement of the live lever reverses the direction of the sliding ratchet and through the bottom brake rod ratchet increases the length of the brake rod. The use of ratchets makes the adjustment positive and eliminates the possibility of loss by slipping.

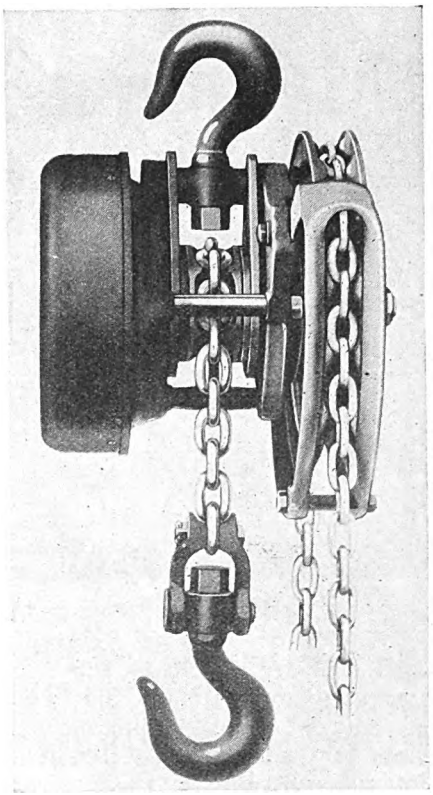


Automatic slack adjuster cut away to show parts
1, Live lever; 2, adjuster crank; 3, ratchet housing; 4, bottom brake rod ratchet; 5, adjuster screw.

Your rebabbitted bearing shells, that don't give a tone like a bell, are likely to run as hot as H——

Spun-Geared Chain Hoist

SPUR-GEARED ball bearing chain hoists in a complete line with capacities from ¼ to 10 tons are announced by the Dickerman Hoist Manufacturing Company, Cleveland, Ohio. The steel ball bearings are self-contained, having large diameter hardened and ground balls of high carbon chrome-alloy steel, inclosed in hardened and ground chrome-vanadium steel races. Armored felt washers protect the bearings from dirt, grit and other abrasive matter and also retain the lubricant. By means of ducts the oil is delivered directly to ball bearings and pinion cap bearings. To resist the strain and shock of severe use a one-piece steel load wheel is used. Accurately formed chain pockets in this permit free and easy passage of the chain. The top hook and cross head are steel forgings. Gears and pinions are made from a special alloy and gear teeth are cut from machined blanks. An automatic brake holds the load at any desired point.



Spur-geared ball-bearing chain hoist

The gear arrangement is of the planetary type. An endless chain passes over the handwheel, which turns on the screw hub of a ratchet friction disk. This is keyed to a one-piece driveshaft and pinion. The pinion meshes with two gears held diametrically opposite each other in a pinion cage. Integral with these gears are intermediate pinions that mesh with a large internal gear and serve as a fulcrum to rotate the planetary gear.

A pull on either side of the hand chain loop causes the drive pinion to rotate the gears in opposite directions, thus causing the pinion to travel around the internal gear, revolving the pinion cage and load wheel, thereby raising or lowering the load.

High-Speed, Heavy-Duty Metal Saw

MAXIMUM output can be obtained from high-speed steel blades, it is said, with a new metal sawing machine placed on the market by Edward G. Herbert, Ltd., Manchester, England. This machine can run at 200 strokes a minute, which provides a cutting speed of 200 ft. per minute. This is nearly double the usual maximum speed of a hacksaw machine. When run at 200 strokes per minute with a Rapidor H.S.S. blade, this machine will cut

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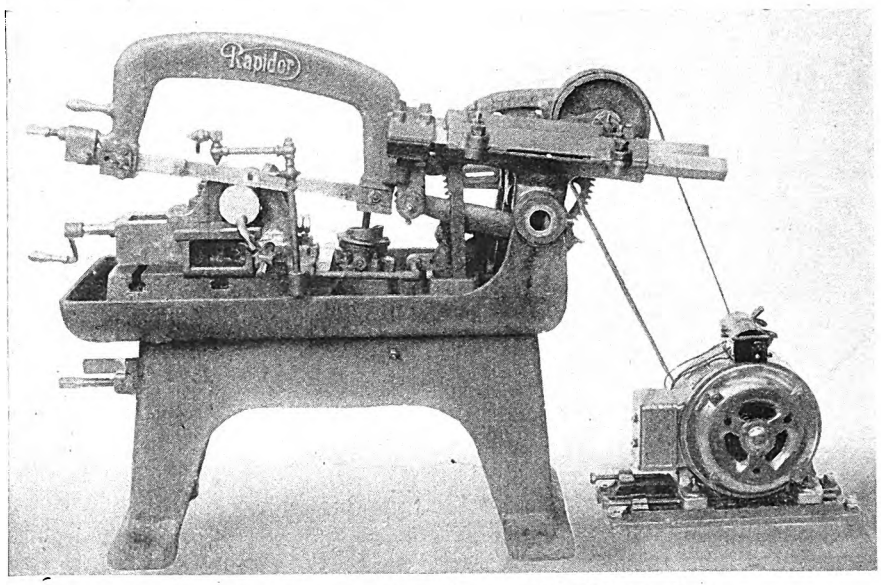


Heavy-duty sawing machine for use with high-speed saws

3-in. diameter mild steel bar in an average of three minutes and twenty seconds. When sawing 3-in. diameter brass bar under the same conditions 100 cuts can be made between sharpenings and the average time per cut is 45 seconds. These outputs are in advance of previous designs of hack-saw machines.

Quick operation is a particular feature of the new design. The saw blade is strained by turning a handle and a patent tension indicator shows when the blade is strained correctly. All operations and adjustments are controlled from one position in the front of the machine. On the three-speed machine the speed changes are made by a handle at the front.

In operating the machine the pressure on the blade is not altered after adjustment. This is unnecessary, because when a blade is dulled, instead of adding pressure and forcing it to cut, it is taken out and resharpened. The vise, of the heavy-duty screw type, has a loose jaw which swivels for holding taper work. The screw is fitted with a ball thrust washer, which lessens the effort required from the operator when fixing work. A control device makes it possible to start on sharp corners without damage to the blade.

The new saw is made from machine-molded castings. Rotating shafts are ground to size and run in renewable phosphor bronze bearings. The main slides are adjustable for wear. The crank and frame pins are hardened and ground. Grease gun lubrication is used.

Motor-driven machines have speed-reducing gearing and the motor can be fixed on slide rails on the floor behind the machine. If portability is required the motor can be bolted to the body of the machine. All gearing is machine cut and guarded.

Long Life Feature of New Hoists

IMPROVEMENTS in the new Model K Cyclone hoist manufactured by the Chisholm-Moore Manufacturing Company, Cleveland, Ohio, include an increased efficiency of 90 per cent, as against 80 per cent of previous models. Particular attention has been given to providing a material and construction which will give long life. Among the changes is the addition of anti-friction bearings at every rotating point. Altogether eight ball bearings, four roller bearings and one Timken thrust roller bearing in the lower swivel hook are used.

One of the most important changes is the use of four eccentric roller bearings. In previous models the rollers of these bearings were loose and had to be fitted carefully into their cage at the time of assembling. In the new model these roller bearings are built in one complete unit, which does away with loose rollers.

Another improvement includes the use of a new steel alloy of extreme hardness. This gives exceptionally clean and accurate chain pockets and reduces the wear at that point. All parts are made interchangeable, so it is possible to assemble them in the hoist quickly without regard to rights or lefts. Center punch marks or other generally accepted means for indicating the correct position are not necessary.

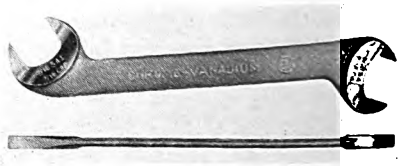
The entire mechanism is inclosed in a dustproof, oil-tight frame. This feature makes possible a minimum of attention for the hoist as it needs only to be packed with grease once a year under ordinary use. The hoist being exceedingly light, it is possible to carry it easily from one job to another. Exceptional efficiency is a feature.

New type of cyclone hoist

Your weak and run-down armatures say "for heaven's sake" treat me to a "dip and bake."

Thin Wrench for Brake Adjustment

HEADS of but $\frac{7}{32}$ in. in thickness feature a chrome-vanadium wrench announced by the Bonney Forge & Tool Works, Allentown, Pa. The extreme thinness makes the wrench easier to use in adjustment



New thin model wrench

of Lockheed brakes, the adjusting nuts of which are not readily accessible to ordinary wrenches.

The new wrench is a double-ender with $\frac{5}{8}$-in. opening at each end for the $\frac{7}{16}$ S.A.E. adjusting nuts. One opening is at $22\frac{1}{2}$ deg. and the other at 60 deg. to the handle.

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Association Activities

Pennsylvanians Meet at Scranton

Well-attended meeting of Pennsylvania Street Railway Association is addressed by President Stevens of the A.E.R.A. and prominent railway men of the Keystone state

IMPROVEMENT in transportation service was the general subject discussed at the annual convention of the Pennsylvania Street Railway Association held Dec. 1 and 2 at Scranton. R. P. Stevens, president of the American Electric Railway Association, chose "Service" as the theme of an address made at the banquet Thursday evening. He stressed the extreme importance of maintaining good relations between the electric railway companies and the public. H. S. Metcalfe, assistant to the president West Penn Electric Company, talked along somewhat similar lines on the same occasion. Prior to the presentation of the addresses of the two principal speakers, Thomas Davies, secretary to Mayor E. B. Jermyn of Scranton, welcomed the convention delegates to the city.

The feature of the afternoon session was a discussion of traffic congestion and its causes by R. C. Haldeman, president Pennsylvania Motor Federation, who emphatically condemned automobile parking.

Another paper presented by W. T. Rossell, general manager Pittsburgh Railways, discussed the need for better organized supervisory methods on electric railway properties, while J. W. Shaw, Philadelphia Rapid Transit Company, spoke on co-ordinating all transportation facilities under a single management. These papers will appear in abstract in a future issue.

Developments in Car Design Discussed by Engineers

Recent improvements in car design were discussed in a talk by George Frey, assistant general sales manager J. G. Brill Company, Philadelphia, Pa. He described in detail the novel features of the Brill model 1928 car, which was exhibited at the Cleveland convention last October. His talk was illustrated with a number of views of this car and its mechanism. The double reduction gear drive on the model 1928 car was discussed by George Woods, railway engineer Westinghouse Electric & Manufacturing Company. He said that four objects had been sought in the design of this drive: First, faster acceleration; second, greater spring support; third, low floor height, and, fourth, quiet operation. In his opinion considerable success has attended the effort to accomplish these objects. J. C. Thirlwall, General Electric Company, called attention to the fact that these new designs are still in the experimental stage.

Many of the brickbats thrown at street railway companies were fully deserved, according to H. S. Metcalfe, assistant to the president West Penn Electric Company, speaking at the annual banquet. In their infancy and through their early years, he said, public utilities in general and street railways in particular developed habits that in many cases have grown with them. Even though there have been sincere attempts to discard the evils of yesterday, those records have not been and will not be forgotten. Franchise evils, the abuses of monopoly, watered stock, ancient equipment, a "public-be-damned" policy and irregular service are all blotches upon the record of street car companies.

Likening the street railway industry to a leopard, Mr. Metcalfe remarked that it is infinitely easier to get spots on than to get them off. However, many of the spots are fading away, he said, and there is a new appreciation of the necessity and worth of street railway service abroad today. A real desire to render true public service is foundational if the mistakes of the past are to be eradicated and this program must begin with the management of the street railway, be conveyed by it to the employee group and interpreted by both management and employees to the public.

Mr. Metcalfe stated that promises without performance are piffle and that all high-sounding statements made by street railway executives amount to nothing more than wind unless service and equipment adequate for every community are provided. In an attempt to change the leopard's spots in the street railway business a willingness to face facts with candor is needed, recognition must be given to the difficulties which arise from acute competition due to the private automobile, an honest endeavor must be made to meet existing conditions and overcome them, and through the whole program an optimism born of faith in future success must be manifested.

Reports of the secretary and treasurer and of the various committees were presented at the Friday morning session. New officers were elected and installed. A moving picture showing how automobile tires should be cared for was presented by the Firestone Tire & Rubber Company.

New Officers Elected

Officers chosen for the coming year are: President, H. L. Mitchell, president West Penn Railways; first vice-president, J. E. Wayne, vice-president and general manager York Railways; second vice-president, H. F. Dicke, vice-president Lehigh Valley Transit Company; secretary, H. A. Buch, Harrisburg; treasurer, C. F. Crane, assistant to the president Harrisburg Railways. The new executive committee will consist of Thomas Cooper, Westinghouse Electric & Manufacturing Company; C. F. Crane, Harrisburg Railways; S. S. Crane, Altoona & Logan Valley Electric Railway; H. H. Dartt, Scranton Railway; Thomas Fitzgerald, Pittsburgh Railways; A. R. Myers, Erie Railway, and W. A. Woolford, General Electric Company.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 16-17*—Midwest Electric Railway Association, Hot Springs, Ark.**

***Jan. 18-19*—Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.**

***Jan. 18-19*—Central Electric Traffic Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25*—Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.**

American Association News

Next Convention City to Be Decided

A JOINT meeting of the committee on policy and the sub-committee on convention contract will be held at association headquarters at 10 a.m. Dec. 16 to decide upon the location of the 47th annual convention. J. P. Barnes, first vice-president of the association, is chairman of the committee on policy and Frank R. Coates, past-president of the association, is chairman of the sub-committee on convention contract.

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Engineering Committee Appointments

BESIDES the committee appointments in the Engineering Association already reported special committee No. 9 of the Power Division is announced. In addition, Morris Buck, New York, N. Y., has been appointed to the committee on subjects, and L. W. Birch, Mansfield, Ohio, has been appointed to the committee on heavy electric traction vice M. W. Manz, resigned.

The personnel of the new committee follows:

POWER DIVISION—SPECIAL COMMITTEE NO. 9—CONDUIT SPECIFICATIONS

A. J. KLATTE, electrical engineer Chicago Surface Lines, Chicago, Ill., chairman.
R. B. W. PECK, New York, N. Y.
W. J. QUINN, New York, N. Y.
E. F. NORTON, New York, N. Y.
HARVEY WOOD, New York, N. Y.
R. B. PATTERSON, Washington, D. C.

Rolling Stock Committee No. 3 —Car Design

MODERN cars must be designed to provide faster schedules with increased acceleration and braking rates, was the general opinion of members of special rolling stock committee No. 3 on car design, which met at association headquarters, New York City, Nov. 30. Those present were H. H. Adams, chairman; O. W. Basquin, J. A. Brooks, C. A. Burleson, W. J. Clardy, L. J. Davis, Charles Gordon, W. L. Harwood, A. P. Jenks, A. L. Kasemeier, G. L. Kippenberger, John Lindall, W. R. McRae and H. S. Williams. In addition to the preceding members of the committee, there were also present at the invitation of the committee N. R. Brownyer of the Timken-Detroit Axle Company, E. R. Fitch of the Westinghouse Air Brake Company, C. W. Squier of ELECTRIC RAILWAY JOURNAL, and Guy C. Hecker of the association staff.

To obtain suggestions as to desirable work that could be undertaken by the committee and the scope of any investigation or tests that should be made, each member was invited to comment on desirable data that should be collected. The general opinion was that in particular two problems should receive attention, first the mechanical problem of studying technical characteristics of various types of drives that are now being incorporated in several improved trucks, and second, a study of features that are needed to meet modern transportation conditions. Some of the essential factors that the committee thought should be considered are light weight, comfortable seating, faster acceleration and braking rates, and faster schedules. With some of the new designs brought out, rates of 3 m.p.h.p.s. for acceleration and braking can be used without discomfort to passengers.

In discussing this phase of the problem, it was generally agreed that smoothness of acceleration is an important factor in connection with any increase made. Jerky acceleration is liable to result in an increased number of accidents from people falling inside cars. Some members of the committee felt that a study of floor coverings should be made in connection with any recommendations for increased acceleration or braking rate. The committee decided that an efficiency test of gearing should be made to obtain preliminary test data throughout the life of the gear. A subcommittee was appointed to obtain an estimate of expenditures necessary for complete tests, the time required, and to outline a desirable procedure in order that the test should be uniform and give desired information.

The committee also decided that an analysis of the advantages and disadvantages of new truck designs recently brought out should be made in comparison with conventional truck designs, and a sub-committee was appointed to compile, by correspondence, a complete comparison of the various new truck designs with trucks of corresponding capacity of the conventional type sold by each manufacturer. The purpose of the collection of these data is not to determine the relative merits of any of these trucks but rather to give the committee a complete comparative analysis of the design so that it can visualize better the possibilities and limitations of the radical developments that have taken place in the last year.

A study of the desirability of so-called de luxe features in cars for a large city, small city and an interurban property was discussed and it was the feeling of the committee that attention should be devoted to the study of this subject. Another phase which some members of the committee felt should receive attention was that of determining the elements in construction and painting which have a desirable or undesirable effect upon the general appearance of cars.

Purchases and Stores

PLANS for the special committee work were discussed at the first meeting of the standing committee of the new Purchases and Stores Division of the Engineering Association held at association headquarters, New York, on Dec. 6.

John Y. Bayliss, chairman, presided. W. J. Walker was elected secretary and A. A. Ordway vice-chairman. The session was largely devoted to the presentation by special committee of preliminary reports on the subjects recommended for consideration during 1928. There was a discussion of the desirability of handling certain of the work of the division in co-operation with the stores accounting committee of the Accountants' Association. There was also a discussion of the possibility of having a joint session with the accountants at the 1928 convention. R. A. Weston, chairman of the stores accounting committee was in accord with co-operative work and a joint convention session.

A program committee to formulate plans for the session on purchases and stores at the 1928 convention was appointed consisting of J. Y. Bayliss, chairman; J. Fleming, W. E. Scott, C. A. Harris, A. A. Ordway and R. A. Weston.

Those in attendance at the meeting were: J. Y. Bayliss, Richmond, Va.; A. S. Duncan, East Pittsburgh, Pa.; A. L. Fischer, Cincinnati, Ohio; W. E. Scott, Philadelphia, Pa.; A. A. Ordway, Boston, Mass.; J. Fleming, Washington, D. C.; W. J. Walker, Schenectady, N. Y.; E. A. Murphy, Indianapolis, Ind.; R. A. Weston, New Haven, Conn.; W. P. McArdle, New York, N. Y.

New Association Bulletins

FOLLOWING is a list of special reports that are being prepared by the bureau of information and service of the American Electric Railway Association, and that will be available to member companies on request:

Bulletin No. 173.—Wages of Employees Other Than Trainmen.—A new edition of the association's regular bulletin on wages of employees other than trainmen, showing for about 250 companies the classification of employees and the wages paid each class in the shop, barn, way and structures, carhouse, overhead line, stores, bus maintenance and garage departments. It also shows the number of hours worked weekly, the average weekly wage earned, overtime rates, and the number of employees in each department.

Bulletin No. 174.—Special Reduced Rate Tickets.—A tabulation showing whether or not companies are required to give reduced transportation rates to children, students, workmen, or any others, based on a survey of nearly 300 companies. Where reduced rate transportation is required by law, the table shows what rates are specified and whether or not tickets are sold on the cars and, if not, where they may be purchased.

Bulletin No. 175.—Rate of Return Allowed Electric Railways.—Extracts from decisions of public utility commissions on which the rate has been fixed after official determination of the amount upon which the company is entitled to earn a return. This is a new edition of Bulletin No. 96, issued on Aug. 1, 1926, and includes decisions handed down since that date. A second part has been added showing rates of return established in franchises.

Bulletin No. 176.—Free Transportation on Electric Railways.—Shows for 338 electric railway companies whether or not they grant free transportation to policemen, firemen, letter carriers, employees and members of employees' families. In addition there is shown whether or not such free transportation is required by law and, where this is the case, the nature and extent of the requirement.

In addition to the above the following supplements have been prepared, bringing the information they cover down to Dec. 1, 1927:

Supplement No. 2 to Bulletins Nos. 163 and 164.—*Electric Railway Fares.*

Supplement No. 3 to Bulletin No. 160.—*Wages of Trainmen.*

Supplement No. 3 to Bulletin No. 161.—*Wages of Bus Men.*

Cost of Living Studies (Bulletin No. 177).

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News of the Industry

Under New Auspices

Riding public informed of management change in St. Louis. Work of receiver publicly recognized

OPERATION of the lines of the United Railways, St. Louis, Mo., was started at midnight Nov. 30 by the St. Louis Public Service Company. So far as the riding public was concerned there was no appreciable change. Motormen and conductors wore hatbands with the name of the company and in addition the conductors had silk badges with the inscription "We Start Today." Each passenger upon entering the car was handed a folder entitled "All Aboard." The lead article was headed "We Make Our Bow." On the outside of all the cars were signs reading: "Now! This Street Railway System is Operated by the St. Louis Public Service Company." Inside the cars were other signs telling of the change in management. On some of the cars the old "U.R." on the outside had been replaced with the words "Public Service" painted in orange on a black background. Other cars will be so marked as quickly as possible.

The old United Railways tokens will be used for the time being, while the supply of transfers on hand when Receiver Rolla Wells turned over the properties will be utilized and transfers with the name of the new company probably will not appear for about a month.

Full-page advertisements were inserted in all of the St. Louis newspapers headed "Today We Make Our Bow." The body of the advertisement was as follows:

Beginning today the St. Louis Public Service Company is operating the railway system of St. Louis and St. Louis County. Service will be maintained without interruption and for the present there will be no changes affecting patrons.

In assuming the responsibilities that go with the maintenance and operation of this great transportation system we wish to recognize, with keen appreciation, the good physical condition of the property as it is turned over to us by the receiver, Rolla Wells, Col. A. T. Perkins, his manager, and staff.

The St. Louis Public Service Company begins its management of the railway with a thorough understanding of the growing transportation needs of this community. The new management includes men of training and long experience in the operation of railway properties. These men have been assisting in the reorganization and are familiar with the property.

The St. Louis Public Service Company assumes the task of serving the public. This service must be of such a character that it will win both the good will and patronage of the citizens of this community. It will be the policy of the new company to determine the character of service desired by the public and then to supply that service with the understanding that the public will gladly pay the fare necessary to maintain it.

Frank criticism and constructive suggestions will be invited. It is only through a mutual understanding of the problems involved that complete confidence can be built up. The St. Louis Public Service Company pledges itself to do everything possible to establish that confidence, so that a cordial relationship may exist between the patrons and its transportation system.

Subway Items in Budget Hit

Supreme Court Justice Wasservogel has handed down an opinion granting a peremptory writ of mandamus to William Jay Schieffelin against Mayor Walker of New York, the Board of Estimate and others on the application of the Citizens Union for elimination from the 1928 city budget of a $13,000,000 appropriation for amortization of the first instalment of rapid transit stock for the new independent subway system.

The New York *World* says:

Whatever the outcome of this litigation, it has already become evident that the Delaney plan is unworkable. Mr. Delaney asked for an initial budgetary allotment of $20,000,000, which was to be quadrupled within four years. It was found that the first $20,000,000 could not be provided without raising the tax rate or else curtailing expenditures for other purposes. The city administration naturally shrank from either alternative and consequently was compelled to reduce the first appropriation to $13,000,000. The setback which this plan has received in no way interferes with the unification program now in preparation by the Transit Commission. Instead, it rather emphasizes the need of the economies of unified service as the way out of the muddle.

Readers, What Have You?

NEW YORK Public Library, 42d Street and Fifth Avenue, New York City, wants to complete its volumes of *Street Railway Journal*, the predecessor of this paper. It is making an appeal to us to help find the missing numbers. It lacks the following:

Vol. 1—November, 1884, to October, 1885.

Vol. 2—November, 1885, to October, 1886.

Vol. 3—November, 1886, to December, 1887.

Vol. 4—January, 1888, to December, 1888.

Vol. 5, No. 1—January, 1889.

Vol. 5, No. 6—June, 1889.

Here is your chance to contribute to an institution national in character, and noted as a reference library, the numbers it needs to complete its file of information about the activities of this industry.

Another Jitney Move in Detroit

State Supreme Court refuses to reopen case there which debars parasites from principal thoroughfares

THE Michigan Supreme Court on Dec. 1 refused to reopen the hearing conducted before it last year involving the right of jitneys to operate in Detroit. It is believed that the state court's action, which also included the dissolving of all jitney injunctions, blocks any possible new attempts to get the case back into that court. It dissolved its own injunction previously existing against the enforcement of the ordinance. The legal battle between the city and the jitney organizations has extended from 1922, when the ordinance was passed ruling the jitneys off certain principal streets over which they operated. Since that time court actions of various kinds have prevented the enforcement of the ordinance and the jitneys are still operating.

Corporation Counsel Charles P. O'Neil is awaiting the receipt of the official Supreme Court order before taking any steps to enforce the ordinance. The jitney organizations base their hope for the future on the temporary injunction issued more than a year ago by Circuit Judge Harry J. Dingeman, restraining the city from enforcing the ordinance. Judge Dingeman is now ill, and it was announced by the Corporation Counsel that if the State Supreme Court's order does not dissolve the Dingeman injunction the quickest way to end the injunction will be sought.

The ordinance was first held invalid by the Circuit Court, but on an appeal to the State Supreme Court by the city, that court found it sound. A later motion by Edward N. Barnard, counsel for the jitney drivers' associations, was denied. State Supreme Court Justice John Bird later signed an injunction temporarily restraining the city from making the ordinance effective. Then the matter was carried by the attorney for the jitneys to the United States Supreme Court on constitutional grounds. The city appealed to the full State Supreme Court following the order of Justice Bird and not only lost the appeal but was ordered not to enforce the ordinance until further instructions were received from that court.

Court actions against the jitneys, which are believed to make Judge Dingeman's injunction ineffective, include the state court's action in holding that the ordinance is valid, the denial for one motion for a rehearing and the denial of a recent motion by the jitney organizations for leave to file a motion for rehearing. The United States Su-

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preme Court has also thrown the case out on the ground that it has no jurisdiction, no federal question being involved.

It has been announced by Mr. Barnard that the jitneys will continue to operate until the injunction is dissolved and that the matter will be appealed to higher courts on new grounds that have arisen since the first appeal.

"Narrow-Gage" Will Be Electrified

Hemphill & Wells have purchased the Boston, Revere Beach & Lynn Railroad. New owners plan to give suburbanites de luxe transportation

ELECTRIFICATION plans for the Boston, Revere Beach & Lynn Railroad, popularly known as the "narrow-gage," have been divulged by Gardner F. Wells, new president of the railroad, which was recently purchased by Hemphill & Wells of New York City, an engineering and management organization. The organization also operates the Interstate Street Railway of Attleboro, Mass., and the Poughkeepsie & Wappingers Falls Railway, serving Poughkeepsie, N. Y.

The purchase of the stock of Karl C. Adams, president of the road, amounting to more than 5,000 shares of the outstanding 8,500 shares, at $137.50 a share, was effected through a holding company known as the Eastern Railway Associates, Boston, according to Boston newspaper reports.

Following a complete engineering investigation, the board of directors, consisting of Daniel P. Abercrombie, Charles A. Collins, Albert W. Hemphill, Walter P. Simonds, Gardner F. Wells and George W. Wells, issued the following statements concerning the electrification and the financing of the improvements:

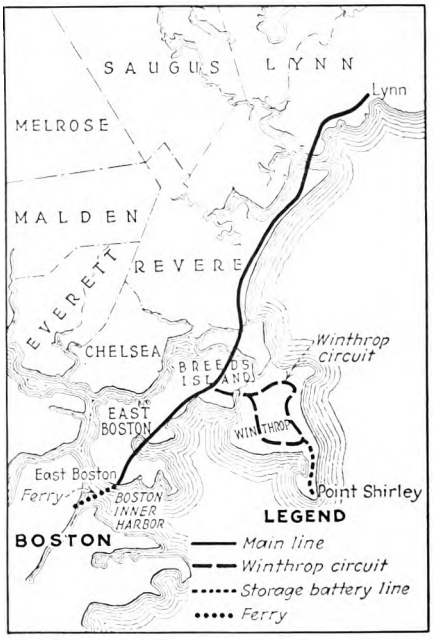
"In order to give the patrons of the road the benefit of improved service, more expeditious movement of trains and modern, efficient methods of operation, with resulting advantage to the company and to the traveling public, the necessary steps will be taken to electrify the company's line and to install such other improvements and equipment as in the judgment of the general managers will most effectively promote the rendering of speedy, efficient and satisfactory service.

"In order to finance the proposed improvements and for other corporate purposes, the directors recommend to the stockholders that they authorize immediate application to the Department of Public Utilities for authority to issue 1,700 additional shares of stock, and $1,000,000 of general mortgage bonds of the company."

Application will be made to the Department of Public Utilities for authority to issue eventually 11,900 additional shares of stock and $1,000,000 of general mortgage bonds, but of the additional stock it is planned to issue only 1,700 shares immediately, authority with respect to the balance being desired for future refunding purposes.

"Subject to the Department of Public Utilities for the security issue necessary to finance the undertaking," stated Gardner F. Wells, "the new management will carry forward its plans to electrify both the 12-mile double-track main line between Lynn and the East Boston ferry terminal and the Winthrop loop line.

"The 3-ft. gage will be retained on the entire system, totaling 34 miles of single track. The complete program will cost more than $1,000,000 and includes the purchase of new car equipment, remodeling of all stations, installation of an overhead system and the construction of substations.



Main line of the Boston, Revere Beach & Lynn Railroad from Lynn to the East Boston ferry and the Winthrop loop

"The cars to be used will be of the de luxe type, modern in every respect and comfortable as well as attractive. The seats are to be individual type, leather upholstered. The cars will be mounted on special narrow-gage Brill trucks, with 50-hp. special-design motors and control equipment for multiple-unit operation. They will be designed so that trains of any number of units, from one to ten, can be operated.

"Catenary type overhead will be installed to distribute the 600 volts direct current to be used on the system. The overhead system was selected rather than the third rail because of the many cuts and marshes on the road and because of the trouble which would accompany the heavy winter snows. Two permanent substations and one portable substation will be used to distribute the electrical energy, which will be purchased from local central stations.

"All passenger stations will be repainted and remodeled. The prepayment system is to be used so that selling tickets at the stations and collecting them on the trains will be eliminated.

"The company plans to give the patrons a high-speed electric service which will prove much more satisfactory than any given heretofore. Trains will operate at more frequent intervals and with greater elasticity.

"Electric trains will provide not only a faster ride but also a cleaner ride. This feature will be appreciated particularly in the tunnels on the road, where the smoke from the steam locomotives has proved in the past a nuisance to the patrons and a problem to the owners."

Steam Operation Began Over Half Century Ago

Since July 20, 1875, more than half a century ago, the "narrow-gage" has been operated to the great convenience and advantage of residents of the North Shore between Boston and Lynn. Its beginning was a humble one, for the company's entire rolling stock included three locomotives and eleven cars. On the first day of operation the trains carried 1,078 passengers. The fare from Boston or Lynn to Revere Beach was 10 cents, making the fare between Boston and Lynn 20 cents. In 1891 the company absorbed the Boston, Winthrop & Shore Railroad, which it made the Winthrop branch. This road was a similar narrow-gage passenger line with a route of 4.7 miles from East Boston to Winthrop and one of 12.6 miles from Crescent Beach to Point of Pines, Revere. Although the line paid no dividends when operated by an independent company, it proved profitable as a branch of the Boston, Revere Beach & Lynn Railroad.

The first president of the railroad was A. P. Blake. In 1891 Col. Melvin O. Adams became president and took over the executive management of the railroad. Upon the death of Colonel Adams, six years ago, his son, Karl C. Adams, succeeded as president and executive manager of the railroad, so that the railroad has been sort of a "stepchild" of the Adams family.

Road Experienced A Rapid Growth

Tunnels were put through the hills in East Boston in the '90s and a new terminal was built with a drop and ferry slip. During the same period the 5-cent fare was introduced, making the total fare from Lynn to Boston only 10 cents. The number of passengers increased by leaps and bounds and increased carrying capacity was demanded. The cars were enlarged and the locomotives were built heavier and larger. Today, after a half century of operation, the company has 26 locomotives and four big, modern ferry boats. Through its long period of operation the road has continued to pay dividends, a rare accomplishment for any railroad.

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Another Move to Restore Railway Service in Columbia

A manufacturer of buses with a branch office at Atlanta, Ga., recently made a definite proposal to the City Council of Columbia, S. C., to operate the street cars of the Columbia Railway, Gas & Electric Company in connection with the buses now run there. The proposition was made by attorneys representing the manufacturer and the Carolina Transit Company, which originally operated the buses in Columbia. Some time ago the bus maker, creditor of the Carolina Transit Company, took over the operation of the buses.

According to the proposal, the bus maker will organize a company with a capital of $250,000 to take over the bus lines and the railway equipment, now idle in the carhouse, and run the two in conjunction.

The suggestion is conditioned on several points, namely, that a proper arrangement can be made with the Columbia Railway, Gas & Electric Company, owner of the railway system, whereby the new company will have conveyed to it the franchise of the old company; that a contract can be arranged to furnish the new company with power at a reasonable rate for a period of ten years; that the City Council enforce the ordinance regarding the operation of jitneys on the streets of Columbia, an ordinance now before the South Carolina Supreme Court; that all litigation concerning the railway system be terminated, and that the Council use its efforts in securing a reduction of the taxable value of the railway system as it appears at the present time and that the Council relieve the system of any obligation for street paving which now exists by virtue of ordinances passed heretofore.

According to the proposal, the manufacturer believes that at the beginning of operation by the new company some 25 or 28 pieces of equipment, including cars and buses, would be in operation on the streets of the city. The Columbia Council has taken the proposal under consideration.

After the street cars were withdrawn last March several actions were started in the courts to compel the restoration of trolley service. Disposition of these has not yet been made. The jitneys also instituted proceedings relative to the constitutionality of an ordinance which required the jitneys to operate over a certain prescribed route and on regular schedule. This matter is also before the courts.

At present the jitneys, carrying passengers for 10 cents, operate over any streets they see fit, cease operations when they so please and offer a competition to any other form of transportation that can hardly be met. Buses too are operated on a 10-cent fare. The jitneys, carrying passengers direct to their doors, have so reduced the patronage of the buses that the latter can hardly keep on operating indefinitely.

The outcome of the latest move to restore railway service in the capital of South Carolina is said to be very problematical.

Successful Bidder for Staten Island Equipment Not Decided

No decision has been made on the public auction sale of trackless trolley cars and trolley cars which took place at the office of the Department of Plant and Structures of the city of New York on Dec. 5. The equipment was first offered in separate parcels and then in one lot. R. W. Marshall, New York, was the high bidder for the separate parcels and H. E. Salzburg & Company, Inc., New York, was the high bidder for the material to go in one lot. A decision on the disposition of the equipment will be made soon. The equipment that was sold was used by the city in service operated by it on Staten Island.

From Exclusive Brighton to Downtown Rochester by Tube

Rochester's $12,000,000 subway in the bed of the abandoned Erie Canal was opened on Dec. 1, with local shuttle service and interurban cars operated by the New York State Railways. There was no official ceremony, but thousands of persons used the line on the first day. A bursted water main held up operation for three hours, but that was the only incident to mar the beginning. The shuttle line provides local high-speed service between Winton Road at the eastern end of the line to City Hall, in the heart of the downtown district.

Rochester & Eastern interurban cars have been diverted from the city streets at Monroe Avenue and are now running in the subway through the city, greatly relieving the traffic congestion problem.

The New York State Railways also is providing freight switching service to industries along the subway line.

Because installation of signals has not been completed, the maximum possible speed is not yet in effect on the railroad.

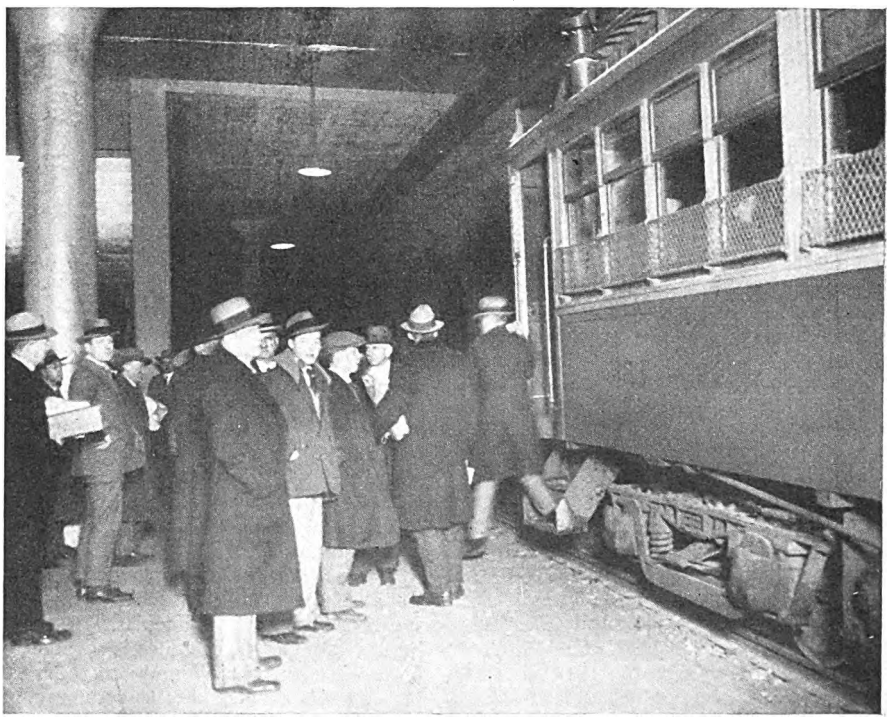
The shuttle service is maintained on approximately a half hour schedule, starting with a running time of eleven minutes from Winton Road to City Hall. This speed, City Railway Commissioner Barnes announced, would be cut considerably when signal installation is finished and the operators are more familiar with the tracks.

The fare on the subway is 9 cents within the limits of the city and 5 cents additional outside.

The shuttle service provides a much needed means of rapid transportation for commuters from the suburb of Brighton. All trolleys make stops at the following stations: City Hall, Court Street, Meigs Street, Monroe Avenue, Culver Road, Colby Street, Winton Road, Highland Avenue, Elmwood Avenue and Rowland's Loop.

The first interurban car leaves City Hall station at 6:10 a.m. and the last one departs at 11:10 p.m. A 30-minute schedule is maintained in the rush hours and hourly otherwise. The local service starts at 6:15 a.m. and stops at midnight.

The subway, running from Oak Street on the western edge of the city and ending at Brighton, an exclusive residential suburb, will be operated by the New York State Railways for a three-year trial period under virtually the same terms as those of the service-at cost contract under which city railway and bus service is maintained.



First commuters arriving at City Hall station following the opening of Rochester's new $12,000,000 subway

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No Selection Yet

Chicago parties fail to agree on arbitration board member. Matter pending since last July

The failure of Judge Kickham Scanlan, representing the street car men's union, and E. J. McIlraith, Chicago Surface Lines' representative, to decide upon a third member of the arbitration board which was approved by both parties on July 19, has resulted in some public discussion. Names of some 25 different persons have been submitted to both members, but the majority have been flatly rejected.

Officials of the local union are said to feel the companies have been remiss about carrying out their part of the arbitration agreement. Mr. Mahon, president of the Amalgamated Association of Street and Electric Railway Employees, is expected to arrive in Chicago this week for the purpose of deciding what action is best. The Chicago Rapid Transit Company trainmen have agreed to be governed by any arrangement reached by the Surface Lines negotiations.

The negotiations for a new wage scale date back to June 1, when the last wage agreement expired. At that time, the Surface Lines employees demanded an increase of 15 cents an hour together with the $20 weekly sick benefits and $1,000 in life insurance, which had been granted to the Rapid Transit Line employees last year. The street railway companies subsequently countered with a proposal to reduce wages 5 cents an hour, maintaining that wages and working conditions in Chicago were the highest and best in the country and that present business conditions justified a cut rather than an increase. The arbitration agreement, which was adopted in July after six weeks of parleying, during which the trainmen voted to authorize their union officials to call a strike if necessary, admitted both the company's and the union's demands as subjects for mediation.

Federal Judge James H. Wilkerson announced that inasmuch as the Chicago Railways is under his jurisdiction, because of receivership proceedings, he might summon the companies and the union representatives before him should the situation become acute. The Chicago Railways represents approximately 60 per cent of the city's street railway mileage.

Fare Hearing in St. Paul on Jan. 5

The postponed hearing by the Minnesota Railroad and Warehouse Commission of the application of the St. Paul City Railway for an increase in car fare, now 8 cents cash or six tokens for 40 cents, is set for Jan. 5, 1928. The former date was Nov. 14, 1927. Judge T. D. O'Brien and W. H. Oppenheimer have been retained by the St. Paul Association of Public and Business Affairs to aid Corporation Counsel Arthur A. Stewart to represent the city. The company alleges it is not receiving the 7½ per cent set by the commission as a fair rate of return on the company's property valuation. The city and association will oppose any increase in fare.

Careful New Jersey Operators Will Receive $130,000

Approximately $130,000 will be paid to operators of railway cars and buses under the no-accident bonus plan put into effect Dec. 3, 1926, by the Public Service Railway and Public Service Transportation companies of Newark, N. J. The object was to provide an additional incentive to careful operators and the further promotion of safety. With the expiration of the first year's trial of the plan the operators will be paid, beginning Dec. 12, by which time the complete records will have been computed. The plan called for the payment to operators of bonuses for good accident records.

The plan will be continued for another year under revisions which will give the operator more frequent returns for his efforts. While Vice-President Boylan says that it is difficult "to determine whether it has brought the return in accident reduction which this large expenditure warrants," nevertheless, believing the great majority of men have tried to co-operate, he has decided to try it again. Under the new plan the year will be divided into three bonus periods as follows:

First period to run from December, 1927, to March, 1928; second period from April to July, 1928. third period, from August to November, 1928. Bonuses will be paid for each period as follows: To operators having a perfect record, $20; to those having one accident, $19; to those having two, $17,-50; to those having three, $15. Those having more than three accident will not be entitled to any bonus. In addition, an extra $20 will be paid to those having perfect records for the three periods. Bonuses will be paid during the first month following the expiration of a period.

In addition a carhouse or garage bonus will be awarded to the carhouse or garage in each division which makes the best showing in each bonus period. The record will be based on a comparison of the number of accidents per 100,000 car-miles during each bonus period, with the record for the corresponding four month of the previous year. This bonus will be $5 for each operator assigned to the winning carhouse or garage on the last day of the bonus period.

Those eligible to bonus participation are regular or extra operators engaged in passenger service who work 95 days in any bonus period. Any operator failing to report an accident of which he has knowledge becomes ineligible for bonus in that period and any operator leaving the service of the company before the final day of any bonus period forfeits his right to any bonus for that period.

Suspended Railway Proposed for Montreal

In an attempt to solve the problem of traffic congestion on the Island of Montreal, Canada, a plan for the transportation of passengers new at least to Canada is now being studied by the chief engineer of the Montreal Tramways Commission, who has been instructed by the commission to report on it.

The system, in brief, may be described as an overhead railway which differs from the ordinary elevated system in that the cars, instead of running on tracks, are suspended like baskets from a specially designed running beam. The designer, W. E. Hamilton, with the assistance of his son, C. Harold Hamilton, has devised the scheme for the peculiar conditions of Montreal. As described the proposed system is apparently similar to the famous suspension monorail over River Wuppur at Elberfeld, Germany.

A report on the proposed system is now being prepared for the chairman of the Tramways Commission. In the meantime the plans are undergoing constructive criticism at the hands of various tramway and railway officials to whom the scheme has been presented by the designer.

Work Started on Important San Francisco Line

Mayor Rolph of San Francisco, Cal., broke ground on Nov. 24 for the Judah Street car line, which is to tap the Sunset district. Sunset residents gathered in jubilation over the long-looked-for line of the San Francisco Municipal Railway. After a brief program of speechmaking the contractors began work on the line. It is expected the road will be completed by Feb. 15.

Date Fixed for Subway Bids in New York

The Board of Transportation of New York City announced recently that it would receive bids on Dec. 30 for construction of another section of the new subway system in Brooklyn, running along Manhattan Avenue from Nassau Avenue to Greene Street, in the Greenpoint district. The contract is the third advertised this month for bids on subway construction work in the area between McCarren Park and Long Island City.

Bids on the section in Long Island City from Arch Street to Queens Street, to form the junction of the Queens Boulevard and Brooklyn cross-town routes at the connection with the 53d Street tunnel to Manhattan, were to be received by the Board of Transportation Dec. 9. On Dec. 21 the Board of Transportation will receive bids for the section along Manhattan Avenue, under Newtown Creek, and along Vernon and Jackson Avenues from Freeman Street, Brooklyn, to Arch Street, Queens.

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New Franchise Modern in Terms Wanted in Grand Forks

Unless a new franchise not so exacting as the present one is granted to the Grand Forks Street Railway, Grand Forks, N. D., by the City Commission the company will go into liquidation as the stockholders will not be willing to continue longer with a proposition that is paying no dividends and shows no prospects of being a paying investment.

Urging immediate consideration of the matter, by the Council a representative of the company stated that the annual meeting of stockholders would be held on Jan. 11, and a 60 days notice of the matter of applying for a new charter had to be given the stockholders. Unless there is some assurance of the company being relieved of the cost of paving, counsel explained that there was no use in trying to obtain a majority vote of the stockholders for the renewal of the state charter.

Baltimore Fare Testimony Concluded

Testimony has been concluded before the Maryland Public Service Commission on a petition filed by the United Railways & Electric Company, Baltimore, Md., for permission to increase the car fare from 7½ cents to 10 cents. Lawyers on both sides have been requested to file briefs with the commission. Final arguments will then be heard.

Fare Increase Sought in Wichita

The Wichita Transportation Company, Wichita, Kan., has filed with the City Commission a request for a new twenty-year franchise and an increase in fares for its electric railway. The company wants street car fares the same as fares for buses, single 8 cents and on down with 24 fares for $1.50. Early in the present year the system at Wichita passed into control of local interests.

Ten Cents in Council Bluffs

The report of the master in chancery which granted the request of the Omaha & Council Bluffs Street Railway for a 10-cent fare in Council Bluffs, Iowa, was recently affirmed by Judge Martin J. Wade. The present fare on the railway line is 7 cents. The city of Council Bluffs fought the attempt to gain a 3-cent boost, contending that the old 5-cent fare was a sufficient and just charge.

In his statement Judge Wade decried the fact that Iowa had no statute providing for the regulation of electric railways. Nearly all other utilities were regulated by public bodies, he pointed out, but under the Iowa law no public body had the power to fix rates and regulate service of a railway. Expressing his impatience with the situation in Iowa with reference to fixing the rates for elecric railways, he said in part:

I have sat for hours almost without number in these cases—the Des Moines street railway, the Ottumwa case and others—in which eminent counsel have talked for hours about the fixing of electric railway rates. For years there has been discussion, but nothing else, about having the power to fix rates conferred upon a commission, or upon the railway commission, or upon the City Council, all without results.

"Borrow Books" Suggested to Cincinnati Employees

All employees of the Cincinnati Street Railway, Cincinnati Ohio, are urged by the management to take advantage of the invitation of Chalmers Hadley, librarian of the Public Library of Cincinnati, to visit the library and borrow some good books and magazines, which really belong to all taxpayers. With time and material on hand the company asks in the *News*, its official organ, "Do we want more pleasure in living and a wider knowledge of the world and its people? We will have only ourselves to blame if we do not use our public library." Mr. Hadley explained in a letter to the company how easy it is to get books.

Another Sensation in Grand Rapids

With city officials, railway experts and mechanical engineers as special guests, the Grand Rapids Railroad, Grand Rapids, Mich., gave the final tests to the new Versare six-wheel electric railway coach a few days ago and placed the new vehicle in regular service for experimental purposes.

With the distinguished company on board the coach was run over the company's lines so they might appreciate the riding qualities, quick acceleration, quick braking and other factors that are sought in meeting present-day traffic conditions. Included in the party were Mayor Elvin Swarthout, City Manager Fred H. Locke, City Consulting Engineer Gerald J. Wagner, City Engineer C. W. Darling, Director of Public Service W. A. Sperry, Director of Public Welfare A. E. Davidson, Safety Director James Sinke, Vice-President and General Manager L. J. DeLamarter of the railway and these representatives and experts representing the industry: O. F. Warhus, vice-president of the Versare Corporation, Albany, N. Y.; W. H. Beattys, Jr., Chicago; J. S. Y. Fralick, Chicago; K. A. Simmon, Pittsburgh; J. C. Morrell, Pittsburgh; P. L. Hermann and W. N. Mohr, Detroit; N. M. McKibbin, Detroit; A. D. Wood, Chicago.

The new coach, developed after two years work by the Grand Rapids Railroad and the Versare Corporation, has been very favorably received by the public.

Philadelphia Electrification Ready by June

Electrification of the line of the Pennsylvania Railroad from Philadelphia to Wilmington and the Octoraro branch to West Chester, via Swarthmore and Media, will cost approximately $11,000,000. The Wilmington line will be completed early in June, 1928, and the West Chester line is expected to be in operation in August. It has been announced that installations of electrical equipment on 128-passenger cars for operation on these lines is practically completed. The electrification of these two lines is part of the railroad's plan now being actively developed for the construction of the new main passenger terminal on the west bank of the Schuylkill, a subway extension under Filbert Street and an underground station for suburban trains at Fifteenth Street and the Parkway. All suburban trains will be electrified for operation in the subway.

Vote Asked on Long Beach, Cal., Proposal

D. W. Pontius, vice-president and general manager of the Pacific Electric Railway, has proposed to the city of Long Beach, Cal., that there be a vote of the people on the three alternative transportation propositions recently presented to Long Beach. In his letter to the city authorities, Mr. Pontius says:

We ask that at the next election, if you do not feel one should be called for this particular purpose, you place on the ballot for the consideration of the voters these three propositions:

Shall the offer of the Pacific Electric Railway to serve the city of Long Beach with local service by unified operation of street cars and buses be accepted?

Shall the Lang Transportation Company's offer to operate local bus service in the city of Long Beach under a 2½-year permit be accepted?

Shall the city of Long Beach establish and operate its own municipal bus service in the city? (If this is carried affirmatively a bond issue will be necessary and will have to be considered at a later election).

The City Manager disagrees with Mr. Pontius concerning the necessity of a bond issue for inauguration of a municipal system of buses. He thinks it can be financed otherwise.

New Identification Signs in Topeka

With the advent of the new year, Topekans will be able to identify the cars of the Topeka Railway, Topeka, Kan., from afar. New 6-ft. boards with signs telling the destination of the car are to be affixed to the upper part of the cars on either side, indicating the town on which line the car is operating. The signs are to be decorative as well as beneficial to the riding public. At present Topeka street cars carry signs only in front.

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Recent Bus Developments

Accounting Order Expected in Pennsylvania in January

Promulgation of an order relating to bus accounting effective Jan. 1, 1928, is probable by the Public Service Commission of Pennsylvania. To this end there was a public hearing before the commission in Harrisburg on Nov. 15. At previous informal conferences, all motor carriers and others interested in the subject were permitted to submit criticisms, amendments and changes.

Several of those who spoke mentioned preference for the classification adopted in 1926 by the National Association of Railroad and Utilities Commissioners and by the American Electric Railway Accountants Association in 1925.

Except for a few instances the Pennsylvania classification follows the fundamentals of the other. Depreciation, however, is not considered a part of maintenance expense, but is set up in a group with amortization of other capital following "other general expenses." The title of this new group is to be "Depreciation and Amortization." Operating expense groups are arranged in the following order: Conducting transportation, maintenance, traffic, general administration expenses, other general expenses and depreciation.

The classification as drawn applies to bus companies, taxicab companies and to trucks when they are an incidental part of passenger operations.

Common carriers are divided into four groups, and for the first three, a classification has been drawn. Class A applies to carriers having an average annual operating revenue of more than $250,000, Class B from $50,000 to $250,000, Class C from $10,000 to $50,000 and Class D, of less than $10,000, for which no classification is prescribed.

Higher Bus Fares in Kansas City Under Consideration

The Kansas City Public Service Company, Kansas City, Mo., is considering raising bus fares and eliminating at least three non-paying bus lines, as it is considered by company officials that this is the only means by which this branch of the public carrier system can be continued in operation. It is expected that these changes will be incorporated into a new franchise now being studied and which will be submitted to the City Council at the expiration of the present grant June 1, 1928.

The Armour-Peaso line, according to Fred G. Buffe, vice-president of the company, is the only one of the nine in operation to show a profit. Operation of the present bus system for the past three years has cost the company $526,636 more than the total receipts. The average operating cost for each mile is placed at 27 cents, compared with the average receipts of 24.4 cents a mile. Officials of the company believe that a cash fare of 15 cents with two tokens for 25 cents will show a proper return on the money invested. In addition to the increased rate, it is planned to use the buses for the most part only during rush hours. The Winchester, Leeds and South Troost lines, because of the poor showing they have made, are slated for discontinuance. They are said to show a loss of approximately 10 cents a mile. In 1926 the system operated at a loss of $307,302 and so far this year the loss has been $134,530.

From Pasadena to the Pacific at Long Beach

The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for a certificate of public convenience and necessity to operate auto stage service between Pasadena and Long Beach over a route specified in detail in the request to the state body.

Fewer Cruising Taxis in Philadelphia

Experiment in regulation under co-operation of state body and city authorities. Diamond and Cunningham cabs pass to local railway

ON DEC. 12, or shortly thereafter, a plan will be put into effect in Philadelphia which it is expected will serve still further to relieve street traffic congestion. It relates to the regulation of the cruising taxi. Its narrow downtown streets greatly complicate the problem of traffic congestion in Philadelphia. Last winter congestion became so acute that car and bus riders of the Philadelphia Rapid Transit Company were seriously inconvenienced. Cruising taxicabs in the central business district naturally add to the volume of traffic.

The Yellow Cab Company felt for a long while that if the cruising problem could be satisfactorily solved the traffic situation would be helped considerably. Accordingly the Pennsylvania Public Service Commission appointed a committee of cab operators, one from each of the four most prominent companies, to report a plan to eliminate the cruising practice. The commission has now approved this report, and the City Council has passed an ordinance authorizing the establishment of the additional 176 cab stands in the central section.

Plea Made for Cruising Cabs

The committee representing the cab companies held numerous conferences, but it was apparent at the outset that continuation of intensely competitive methods among rival cab companies would make impossible any effective regulation of cruising. Moreover, the two smaller companies—the Diamond and the Cunningham—felt that they would suffer material losses in revenue if forbidden to cruise, since their revenue is derived almost wholly from this source. This obstacle, however, was removed by the agreement of the Philadelphia Rapid Transit Company to purchase and merge them with the Yellow Cab Company under terms to be submitted to the commission for approval.

Full consideration was given to the valuable service which the cruising cab now provides to the riding public by making this form of transportation readily accessible in the busiest sections of the city. However, the committee believed that the plan which it submitted, while reducing to a minimum the interference of the taxicab with moving traffic, will at the same time increase its usefulness as a public carrier by making it even more accessible to prospective riders.

Expansion of Present Cab Stand Idea

At present there are fifteen regular cab stands in the district affected by the new plan, with accommodation for 60 cabs. In addition about 540 cabs are now cruising in the downtown streets at the peak hour. It was recommended that the present stands be retained and that 176 new stands be established with accommodation for 384 cabs. The number of cabs within the district in the peak hour will thus be reduced from approximately 600 to 444, or about 25 per cent. The feeling of the committee was that these cabs will give a better service than is now possible, since they will be distributed more nearly in accordance with traffic requirements and will be stationary except when in actual service or when returning to a stand. In so far as possible these stands are placed at such frequent intervals that any prospective rider can get a taxicab at the nearest street corner.

Telephones will be installed at each end of 159 of the proposed 191 stands, one connecting directly with the Quaker switchboard and the other with the Yellow switchboard. These phones will be available to the public without charge.

Yellow and Quaker have agreed that the two companies shall have equal rights at all stands and that the stands will also be opened to any other cab company or individual cab owner operating under certificate of convenience

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from the Public Service Commission. Cabs bringing riders from the residential district to the business section will, after discharging their passengers, proceed to the nearest telephone stand and report by telephone to the dispatcher. Cabs carrying riders out of the business district will be replaced by additional cabs dispatched from garages as needed. During the peak hours all stands will be occupied in accordance with the demands of traffic. At all times cabs will be under the supervision and control of the telephone dispatchers and street supervisors in the district.

In other words, the two larger companies, Quaker and Yellow, are ready, with the co-operation of the commission and the city authorities, to conduct an experiment in cruising regulation within the district bounded by Arch Street on the north and Walnut Street on the south, inclusive, from the Delaware River to the Schuylkill River, these boundaries to be extended later to include the entire city as rapidly as the new method proves itself feasible and in the public interest.

New Entertainment for Toledo Children to Ride Buses

Mothers in Toledo, Ohio, are finding a new use for the feeder bus lines operated by the Community Traction Company. They give the children a nickel and put them on the bus, with a result that a child can be entertained for an hour or more by making five rides. Some children also use the bus as a pleasure vehicle by getting a dime and taking the whole neighborhood for rides. The fare for children is 1 cent.

Commissioner E. L. Graumlich reported to the board of control that the practice does not bother the company much because it is carried on mostly in off hours when travel is light. Children are provided with safe passage, are practically insured against injury and they get a good long ride for their money. Bus operators get to know them by their first names and this acquaintance feature has proved helpful in creating goodwill between drivers and patrons.

Agreement Reached on Maryland Bus Rules

New rules dealing with the operation of buses in Maryland have been agreed upon by the Maryland Public Service Commission and the operators. At a hearing on Dec. 1 all the rules but one as agreed upon at an earlier hearing were acceptable to all concerned. The one rule required the companies to make detailed reports every two weeks. These reports require so much time that the operators asked the commission to make a change.

It has been agreed that the companies keep duplicates of the daily manifests and file these every two weeks and then make detailed reports once a month. It is said that this plan was agreed to by John N. Mackall, chairman of the State Roads Commission, who wanted the reports for his department. The copies of the manifests, however, will supply him with the information he needs, it was stated, and the Public Service Commission has agreed to make this change, which met with the approval of the large number of operators who attended the hearing.

Effort to Speed Up New York Grants

Efforts are being made to speed up the hearings by the New York Transit Commission to act as quickly as possible on the applications of the Equitable Coach Company and the Tompkins Bus Company for certificates of convenience and necessity to enable them to exercise the bus franchises awarded by the Board of Estimate. The franchise granted the Tompkins Bus Company for operation on Staten Island stipulated that operation should begin within 120 days after the grant and this period will expire on Dec. 10. There is a further clause in the franchise which, in effect, grants a further period of thirty days, in which time either the board or the company may cancel the franchise.

It was said in city circles recently that the company probably would apply for an extension of the 120-day period if the commission did not grant a certificate at once. It has been discovered that through error there is a gap about a mile long in one of the Staten Island routes covered by the Tompkins Company's franchise. It was said that this route probably would have to be readvertised and approved again by the Board of Estimate.

During the week objection was registered before the commission by the Brooklyn-Manhattan Transit Corporation to the affirmation of the bus grants.

Buses May Be Operated on Another St. Louis Line

The St. Louis Public Service Company, St. Louis, Mo., plans to eliminate its Marcus Avenue railway line between Easton and Natural Bridge Avenue. If this move is made buses will be substituted for the one-man cars now in use and the line will be extended northward to connect with the Bellefontaine and Taylor Avenue car lines at West Florissant Avenue.

For the Convenience of Portland's Scholars

The Portland Electric Power Company, Portland, Ore., has extended its 39th Street bus line for a number of blocks in the Eastmoreland district to accommodate students of the new Eastmoreland school, recently opened. This gives through service to a district where previously more than one transfer was necessary from street car to bus.

Gray Line Activities Intensified

Electric railways, particularly those affiliated with the Gray Line, will be interested in the deliberations of the convention of the Gray Line, held at Banff, Alberta, Canada, during the latter part of September, 1927.

So as to foster co-operation between tourist agents and transportation, railroad and steamship companies and the Gray Line, plans were made for the co-ordination of ideals for increasing mutual benefits, with the end in view of supplying the general public with the highest type of service. Many details were discussed tending toward the betterment and development of sightseeing, to which each member contributed his part with pertinent remarks.

Diverse phases of sightseeing were taken into consideration to increase the efficiency of the service of the Gray Line, and to maintain good will all along the line. In fact, all possible avenues for the heightening of the standards of the service which the Gray Lines is organized to give were explored.

Louis Bush, president, emphasized the importance of co-operation in his report. He said, in part:

> You have in your hands probably the greatest travel institution of all times. Have you the vision to see past your own little sphere? Our future lies ahead. Remember it is by giving and doing that we succeed, and if each one will do his best for his fellow members the benefits will be greater than all that money could buy. Operating under the principle that by one all are known is rather a dangerous one unless we also adopt a further ideal of service above self.

In the secretary's report Mr. Springer enumerated the accomplishments of the past year. He advised of the wonderful growth of the Gray Line family by the addition of St. Paul, Milwaukee, Portland, Me.; Buffalo, San Diego, Norfolk, Pittsburgh, Kansas City, Ottawa, Montreal, Quebec and Minneapolis. Mr. Springer further outlined the progressive plans and ideals guiding the future development of the Gray Line, and also reviewed the results of the efforts of Mr. Dooley, traveling representative for the organization.

Officers were elected for the ensuing year as follows: Louis Bush, president, Washington, D. C.; E. B. Brown, vice-president, Los Angeles; Adrian Hughes, Jr., treasurer, Baltimore, and George E. Springer, secretary, Baltimore.

In addition to the officers, the members of the executive committee are as follows:

J. I. Brewster, Banff; S. K. Smith, Salt Lake City; J. J. Reddington, New York; H. B. Olsen, Victoria; C. C. Kunz, Chicago; B. L. Thomas, Boston; J. L. Crowley, Philadelphia, and W. A. Mulpeters, San Francisco.

The next annual convention will be held at New Orleans, La., Oct. 8-10, 1928.

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Financial and Corporate

Approval Sought for $7,000,000 of Capital Improvements

Acting under the 1907 city-company agreement, the Philadelphia Rapid Transit Company, Philadelphia, Pa., on Dec. 1 requested City Council to approve the expenditure of $7,000,000 of capital funds for property betterments and retirement of securities. The request was sent to the transportation committee. It was explained that the money was to be used next year, and Ralph T. Senter, president of the P.R.T., gave details of the purposes for which the money was to be applied.

Preferred stock in the amount required is to be sold to raise the money. The largest amount is $2,750,000 for miscellaneous track improvements, extensions of lines, betterments to carhouses and substations, in compliance with the Snow report to the Public Service Commission. This work is to be done on various lines and at all of the carhouses and substations, it was said.

Retirement of bonds of underlying companies is included in the financial program for 1928. The largest amount in this part of the program proposed is $1,375,000 of car-trust certificates issued in payment of rolling stock. In addition, the financial item of the request sets forth that $92,000 of P.R.T. bonds maturing in 1957, $60,000 maturing in 1962 and $105,000 of the issue maturing in 1944 are to be retired.

There are also $20,000 of the Philadelphia & Willow Grove Railway bonds, maturing in 1934; $34,000 of Union Traction, maturing in 1952, and $25,000 of the People's Passenger Railway securities to be disposed of.

Oakland Branch Abandonment Prohibited

The California Railroad Commission denied the application of the Key System Transit Company to abandon a branch line which extends along Piedmont Avenue from the southern gate of Mountain View Cemetery to a connection with the Piedmont Avenue car line at or near the intersection of Piedmont Avenue and Mather Street, in the city of Oakland.

Dividend on Manhattan "L" Stock Deferred

The Interbourough Rapid Transit Company announced on Dec. 6 that the dividend on Manhattan Railway stock due on Jan. 1 will be deferred. Under the modified guarantee, the Interborough pays $5 a share annually as dividend rental on stock of the company from which it leases the elevated lines. A back dividend rental of $1.25 on the stock declared Sept. 1 brought payments on the stock up to date. Frank Hedley, president and general manager of the Interborough, said:

Under the terms of the Interborough-Manhattan readjustment plan of 1922, the amount of the quarterly instalment of Manhattan dividend rental due Jan. 1, 1928, is determined by earnings for the three summer months ended Sept. 30, 1927. The earnings of that period, calculated as provided for in the plan, were insufficient to warrant any payment.

For the four months to Oct. 31, the Interborough reported gross earnings of $20,917,881 and deficit of $302,805 after interest and charges.

Engineers Engaged to Survey Massachusetts Interurban

The Boston, Worcester & New York Street Railway, incorporated as a result of a drastic reorganization of the property of the Boston & Worcester Street Railway, Framingham, Mass., has engaged the Buchanan & Layng Corporation of New York to make a complete survey of the situation and take charge of the operating management of the company. C. B. Buchanan, the president, is now in Framingham and will spend three or four months in a personal study of all angles of the situation affecting both passenger and freight service and motor coach operation.

Holding Company for St. Louis and Kansas City Stock

A company to hold common stock of the electric railways of St. Louis and Kansas City, known as the City Utilities Company, has been organized under the laws of Delaware by J. K. Newman and others interested in the St. Louis and Kansas City railway systems. Mr. Newman has been elected president of the new company and Col. A. T. Perkins, who was manager of the United Railways under Receiver Rolla Wells, has been named vice-president.

The City Utilities Company was formed to expedite the work of looking after the affairs of the new interests in St. Louis and Kansas City. The extent of its holdings has not been made public.

Mr. Newman was one of the chief figures in the reorganization of both the St. Louis and the Kansas City railway properties.

Stock of the Kansas City Public Service Company is held in trust for five years by five trustees, W. S. McLucas, William G. Woolfolk, George W. Davison, J. K. Newman and Powell Groner. This was accomplished under the reorganization plan. Beginning in April voting trust certificates were issued to the owners of the old holdings of the railway.

Traffic, Fare and Wage Figures

Electric railway traffic continued to decline during the month of October compared with the similar month of the previous year. The number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 198 companies for October, 1927, compared with October, 1926, is as follows:

October, 1927.....	785,250,909
October, 1926.....	801,672,805
Decrease, per cent.....	2.05

The average cash fare in cities of 25,000 population and over:

	Cents
November 1, 1927.....	7.9846
October 1, 1927.....	7.9516
November 1, 1926.....	7.7570

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate Cents	Index Number 1913 = 100 Per Cent
November 1, 1927.....	57.27	210.17
October 1, 1927.....	57.26	210.13
November 1, 1926.....	56.88	208.73

$18,000,000 Refunding Issue at Minneapolis

An issue of $18,000,000 in refunding bonds of the Twin City Rapid Transit Company, Minneapolis, Minn., to be used for refunding the bonded debt of both the St. Paul City Railway and the Minneapolis Street Railway is planned by the company. The purpose of the company, according to a statement by Mr. Lowry, is to make possible refunding of all existing debt as it matures, and to provide complete separation of the bonded debt of the two companies. The companies operate independently under state regulation.

A statement issued in anticipation of the issue being advertised for sale to the public by the bankers said:

The first and refunding 5½ per cent mortgage bonds of the Minneapolis company and the refunding 5½ per cent mortgage bonds of the St. Paul company are to be pledged as collateral security, dollar for dollar, for an issue of first lien and refunding 5½ per cent bonds of the Twin Cities Rapid Transit Company.

This will enable the operating companies to refund their present bonded indebtedness as the same matures, at a cost much less than if each company were financed independently. It also provides a complete separation of the bonded indebtedness of the two companies and the cost of the money will be the same in each city.

There will be issued at this time $18,000,000 of first liens and refunding 5½ per cent gold bonds of the Twin City Rapid Transit Company. This issue of bonds has been sold to a syndicate of bankers headed by the Federal Securities Corporation, including the Chase Securities Corporation, New York; H. M. Byllesby & Company, Inc., and Halsey, Stuart & Company, Inc. It is expected this banking syndicate will make a public offering of the securities at an early date.

A petition filed with the state regulatory body stated that the bonds will

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mature in 25 years. A total of $12,037,000 will be pledged by the Minneapolis company with $5,963,000 allocated to the St. Paul company.

Public offerings of the $18,000,000 Twin City issue was made on Dec. 7 at a price of 97 and interest to yield more than 5.70 per cent.

Revenue and Traffic Fall Off in Honolulu

The total revenue from all sources for the year 1926 of the Honolulu Rapid Transit Company, Honolulu, Hawaii, was $1,023,772, compared with $1,074,483 for the year 1925. Total operating expenses for the year were $662,932, compared to $708,716 for the year 1925, in addition to which the sum of $13,939 was charged to operating expenses for replacements during the year, compared with $26,283 for replacements during 1925. These facts were contained in the manager's report, a part of the annual statement.

The number of passengers carried during the year 1926, compared with 1925, is here shown:

Rail:	1926	1925
Full fares and half fares	16,286,105	17,071,473
Free fares	92,081	169,929
Total	16,378,186	17,241,402
Transfer passengers carried	3,357,651	3,499,425
Kalihi Bus Operations:	1926	1925
Full fares and half fares	347,287	351,044
Free fares	1,108	1,686
Total	348,395	352,730
Transfer passengers carried	315,165	305,923
Bus miles operated	128,441.30	130,596.70

The segregation of transportation revenue and operating expenses is here shown, comparing the years 1926 and 1925;

Revenue:	1926	1925
Passenger revenue	$992,063	$1,040,452
Bus revenue	21,536	21,081
Special car revenue	1,265	1,254
Freight revenue	242	....
	$1,015,107	$1,062,788
Operating Expenses:	1926	1925
Way and structures	$55,204	$63,111
Equipment	74,127	76,797
Power	94,179	104,868
Conducting transportation	322,356	346,578
Traffic	2,252	5,926
General and miscellaneous	114,811	111,435
	$662,932	$708,716

Power was taken from the Hawaiian Electric Company during the months June to October, both inclusive, and the three-year contract was terminated as of Dec. 1. The company is now operating its own power plant without a stand-by contract, but with the assurance that power will be furnished in case of emergency at the contract rates pending negotiations for a new contract.

Expenditures on upkeep of track and equipment were kept as low as possible consistent with the general program of economy.

The capital expenditures program for the past year amounted to $28,333.

The report states that the group life insurance has proved its value in the assistance provided for the families of several employees who died since the insurance has been in effect. The employees' relief fund, which is handled by the employees' council, is being drawn upon in many cases of real need and is proving a benefit which is well worth while.

President Castle's report to the stockholders refers, among other things, to the Sachse survey and recommendations.

REVENUE ACCOUNT OF HONOLULU RAPID TRANSIT COMPANY, LTD., FOR YEAR ENDED DEC. 31, 1926

Revenue from transportation		$1,015,107
Operating expenses		662,932
Net revenue from transportation		$352,175
Revenue from other railway operations		8,664
Net revenue from railway operations		$360,840
Taxes—		
Property	$83,188	
Income	9,672	
Capital stock	1,030	
Corporation income	25,924	
Public utilities	2,074	
Vehicle licenses	739	
Bus licenses	50	122,678
Gross revenue, less operating expenses and taxes		$238,161
Depreciation	$46,607	
Replacements chargeable to operating expenses	13,939	
Loss on property retired	3,097	63,644
Net revenue 1926		$174,517
Interest on loans	$6,318	
Dividends	150,000	156,318
Balance net revenue 1926 to surplus		$18,198
Surplus:		
Balance as at Jan. 1, 1926	$266,406	
Less, additional corporation income tax, 1924	4,689	261,716
Balance carried to 1927		$279,914

Situation in Oklahoma City Declared Promising

The Oklahoma Railway, Oklahoma City, Okla., has been placed on a paying basis under the federal receivership, according to figures made public by G. T. Lackey, one of the receivers. Net earnings of the company from Jan. 1 to October of this year were $89,571, after all expenses and depreciation were provided. During October the net earnings were $14,188, compared with $8,114 for September. A large amount was spent for repair work and new material in September.

Purchase of California Line Sanctioned by I. C. C.

Plans of the trunk line railroads for acquiring the Central California Traction Company were finally approved on Dec. 5 by the Interstate Commerce Commission.

The Southern Pacific, Western Pacific and Santa Fe will jointly take over the electric railway under the arrangement approved, paying for it $2,650,000.

Under the terms of the original proposal, the Southern Pacific alone would have acquired the electric system, but the commission required it to share ownership.

The railroads concerned already have completed their financing arrangements for the purchase.

Smaller Preferred Dividend in Denver

The directors of the Denver Tramway Corporation, Denver, Col., have declared a quarterly dividend of three-quarters of 1 per cent on the preferred stock payable on Jan. 1 to holders of record Dec. 15. From October, 1925, to October, 1927, inclusive, the company paid quarterly dividends of 1¼ per cent on this issue. The preferred stock is preferred as to dividends up to 7 per cent per annum, of which the first 5 per cent is cumulative, whether earned or not, and the remaining 2 per cent cumulative only when earned in any year, but not paid.

New Directors in St. Louis

The new directors of the St. Louis Public Service Company, successor to the United Railways, are as follows: Louis P. Aloe, president A. S. Aloe Company; A. T. Perkins, vice-president City Utilities Company; Mark C. Steinberg, president Mark C. Steinberg & Company; Stanley Clarke, vice-president St. Louis Public Service Company; A. C. F. Meyer, president Lafayette-South Side Bank; J. K. Newman, president Newman, Saunders & Company, Inc., New York and New Orleans; Henry S. Priest, Boyle & Priest; A. L. Shapleigh, president Shapleigh Hardware Company, St. Louis; J. Sheppard Smith, president Mississippi Valley Trust Company; Walter W. Smith, vice-president First National Bank in St. Louis; F. O. Watts, president First National Bank in St. Louis; George W. Wilson, president Mercantile Trust Company, and Hugo Wurdack, president Wurdack Securities Company.

OPERATING STATEMENT OF THE HONOLULU RAPID TRANSIT COMPANY, LTD.

	Gross Operating Revenues			Operating Expenses and Other Charges									Net Revenue, Exclusive of Deductions for Depreciation and Interest and Profit and Loss
	Transportation	Other than Transportation	Total Revenue	Way and Structures	Equipment	Power	Conducting Transportation	Traffic	General and Miscellaneous	Total Operating Expenses	Taxes	Total Operating Expenses and Taxes	
Total 1926	$1,015,107	$8,664	$1,023,772	$65,832	$77,438	$94,179	$322,356	$2,252	$114,811	$676,872	$122,678	$799,550	$224,221
Total 1925	1,062,788	11,695	1,074,483	88,261	80,894	101,904	346,578	5,926	111,435	735,000	94,847	829,847	244,636

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Book Reviews

The Claim Agent and His Work

By Smith R. Brittingham, LL.B., assistant general solicitor Seaboard Air Line Railway. New York: The Ronald Press Company. 466 pages. Price $6.

There are too few books on the important subject of claim adjustments. Their place is not taken by treatises on the law of negligence, written primarily for lawyers, although they also form a necessary adjunct to the library of the claims man. The book under review, by an author who understands the problems met in railroad claims work, while primarily directed to the steam railroad claims man, has also practically as direct application to the electric railway field.

The first half of the book is devoted in large part to a general review of the salient principles of the law of accident liability. There are chapters, for instance, on the passenger, employee under the common law, employee under the federal employers' liability act, licensees and trespassers, invitees or guests, and workmen's compensation. In the latter part of the book, where the scope and principles of claims adjustment are more directly considered, the topics discussed include: Principles of investigation, releases, statistical methods in claim agency, psychology and claim agency, medical phases of claim agency, some problems of the claim agency, and forms. Besides these, there are tables of the expectation of life in years, life annuities, etc., and the appendices include glossaries of medical and legal terms.

The book should help the claim agent over many a difficult problem. It should also, if read by the operating railway manager, indicate to him clearly, if he does not already realize that fact, the extent of the responsibilities of the claim agent and the importance of the work of the claims department.

Beyond the Counter

Mary B. Reeves, manager industrial and school savings the Philadelphia Saving Fund Society, Philadelphia, Pa., 1927. 86 pages. Price $1.90.

Assuming that the welfare of the worker is an important factor in the growth of an industry and the development of a community, a necessary requirement is enlightenment within the ranks concerning the workers' responsibilities as potential capitalists. Thus does labor become stabilized and capital and labor mutually supplementary. There must be a service to help investors, in the opinion of Mary B. Reeves, who has studied banking methods in this country and abroad as a free lance. She has a message for every employer and employee. The employee by this time knows that systematic saving is insurance against anxiety, business reverses and desolate declining years.

At some length Miss Reeves discusses the need for industrial saving from the viewpoint of the employer and gives in detail the two main classifications, namely, the payroll deduction plan and the voluntary association plan. It is her belief that the idea of industrial saving is as yet new to the majority of employers. After years of working in this field she sees in industrial savings a means to reduce labor turnover, to improve the workers' morale and to lessen radical tendencies within the ranks. She is unsympathetic with the notion that employees resent this intrusion into their personal affairs. Rather do they welcome it if the advertising appeal is made with a knowledge of human psychology and from the viewpoint of the worker.

Now that many utility employees throughout the country have had the opportunity to become part owners of an enterprise by subscribing to company stock for their future welfare, Miss Reeves' argument, differently presented for consistent thrift practices and wise expenditures, will meet with their ready indorsement. Her plan means education, to the end that $1,000,000,000 shall not be thrown away annually in speculation.

The Art of Speculation

By Philip L. Carret. Boston, Mass.: Barron's, the National Financial Weekly. 365 pages. Price, $3.

To some persons the title "The Art of Speculation" would seem to have a sinister sound. But the title must be accepted in its broader sense. The need does not exist to go into a discussion of relative values, but it would seem that the reader should be reminded that every one who invests is really a speculator. There is a certain inescapable risk in the ownership of even the highest grade securities. But this review is not intended to be either a defense of the title of the present book or of its contents.

One thing is certain. There is much of interest in the book, particularly for those engaged in various phases of public utility work. Of course, the contents are intended primarly for the market operator, but the chapters that tell the reader how to analyze an annual report correctly, how and when to buy bonds and stocks, carry by their implications a message to officials intrusted with the conduct of the fiscal policies of the corporations for which they act. Of the electric railways in general the author has comparatively little to say, but he concludes his consideration of them with this paragraph:

> Cut-throat competition of bus lines among themselves and with the interurbans will eventually be ended by financial exhaustion of the weaker participants and by legislative and court action to insure safe and adequate public service. When that day comes a real bull market in traction securities is by no means inconceivable.

The prospects of receivership are not pleasant to contemplate, but there is much food for thought in the chapter "Profits in Financial Surgery." Mr. Carret has so handled his subject as to make the book very readable.

Bibliography on Management

Prepared under the direction of the executive committee of the A.S.M.E., Management Division, New York, N. Y. Price $1.65.

This work represents important material published on management. The more than 2,000 references to be found within its pages will show the valuable literature appearing in American and Canadian periodicals and in a great number of books published in England and in Great Britain the past 25 years.

N.E.M.A. Handbook of Supply Standards

New York, N. Y.: National Electrical Manufacturers Association. 231 pages. Price, $3.50.

This completely revised edition of the N.E.M.A. Handbook of Supply Standards is indexed and illustrated and contains standards indorsed by 189 manufacturers, with approximately 125 illustrations, diagrams of designs and methods and numerous tables and curves. These standards have been approved by the standards committee, the official body for the control of technical standardization within the association. "This handbook represents in printed form the experience and knowledge of practical and technical men, who have for years been most vitally concerned with the design, manufacture and installation of electrical supply equipment," says C. A. Bates, chairman of the standards committee.

Alternating-Current Rectification

By L. B. W. Jolley, M.A., General Electric Company, Ltd., London, England. New York, N. Y.: John Wiley & Sons, Inc. 472 pages. Price, $6.

Unidirectional currents have large possibilities both in the supply of power and in the laboratory, yet in no branch of electrical engineering has development been so retarded as in that of rectification. Mr. Jolley has prepared the second edition of his book, "Alternating Current Rectification," noting new improvements and revising the contents thoroughly.

In this treatise the author describes clearly the methods for rectification available and presents the mathematical analysis with numerical examples whenever such are possible. The book covers wave form, mechanical rectifiers, gaseous conduction, liquid conduction, wireless rectifiers and alternating current measurements and voltage regulations. Thermionic rectifiers have received particular attention.

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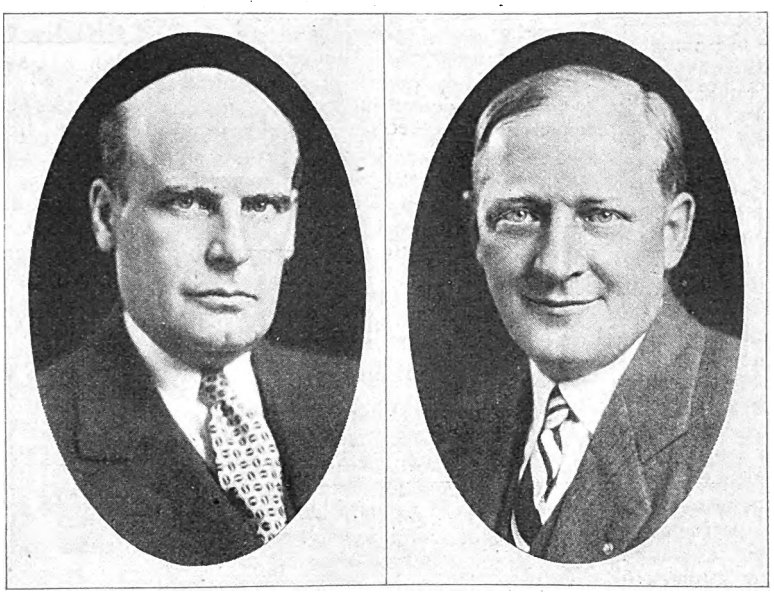
Personal Items

New Management Takes Hold in St. Louis

OFFICERS of the St. Louis Public Service Company, which started operation of the properties of the United Railways at midnight on Nov. 30, include the following: A. L. Shapleigh, president; Stanley Clarke, executive vice-president and counsel; Sam W. Greenland, vice-president and general manager, and Thomas E. Francis, general attorney.

Mr. Shapleigh's position as president of the newly organized properties will be primarily a supervisory one as it was with the United Railways when he served in a similar capacity. He is an important business factor in the West and an officer of the Shapleigh Hardware Company. In commenting on his new position President Shapleigh said that in accepting the post of president he felt that he and his associates, directors and officers of the company, were aware of their responsibility to the public, which it would be their aim to discharge in full. He considered that the general public of the community, as well as the company, owes much to the manner in which the railway properties were maintained during the receivership, just ended, under the leadership of Rolla Wells, as receiver, and Col. Albert T. Perkins, as his manager. With hopes for co-operation on the part of the city and the general public, the aim would be to maintain good service, and from time to time to introduce certain changes in the line of improvements.



Stanley Clarke Sam W. Greenland

Stanley Clarke, who will be in immediate control of the company as counsel and executive vice-president, was counsel for the reorganization committee representing the old security holders. Before going to St. Louis he was prominent in New York, where he was in general law practice.

Sam W. Greenland, the new vice-president and general manager, will have a task ahead of him as important as he had when he went to St. Louis in 1924 to assist in the work in connection with the reorganization of the United Railways. In assuming the rôle of ameliorator at St. Louis he resigned his position as vice-president and general manager of the Indiana Service Corporation, Fort Wayne, Ind., and as general manager of the Fort Wayne & Decatur Traction Company and the Fort Wayne, Van Wert & Lima Traction Company.

Mr. Greenland has a knowledge of public utility problems covering a period of nearly 30 years. In the Middle West he stands for progress both in modernizing and merchandising railway transportation. A notable example of his genius in these respects was his deft handling of the Fort Wayne properties, where an important part of his work was the recasting of the financial structure of the Fort Wayne & Northern Indiana Traction Company and the organization of its successor, the Indiana Service Corporation.

Mr. Greenland was born at Clarion, Pa., in 1879. He was educated at the Pennsylvania Military College, Chester, Pa., and at Penn State University. From the time of his first utility job with the Bell Telephone Company at the turn of the century up through his various connections, both in operating and association activities, until he became identified with the Fort Wayne properties in 1911 and later the St. Louis properties, is a long recital of pushing ahead, winning the confidence of his public and doing big things. The details of this career were included in an extended biography published in the ELECTRIC RAILWAY JOURNAL, issue of April 19, 1924.

Thomas E. Francis, who will act as general attorney for the St. Louis Public Service Company, served as general attorney for the receiver of the United Railways. He estimates that all of the legal work on hand can be disposed of in a month or six weeks from Dec. 1, and then with the acceptance of the report of the receiver the St. Louis Public Service Company will be free to operate the St. Louis railway system as a private corporation still subject to the state law.

With the enthusiasm attending the ushering in of the new régime the untiring efforts of the Wells-Perkins combination in the reorganization details were not overshadowed. St. Louis newspapers unanimously complimented Receiver Wells on the manner in which he filled an important job since 1919. His farewell message to the officials and employees thanked them for their loyalty to him and the company, their support of the rules and policies, their efficiency in service and co-operation for its success. Mr. Wells leaves his post very little changed in appearance with the passing years and he still retains that freshness of outlook and keen analytical vision that made him a civic, financial and political leader of the community. The son of the original promoter of the old Missouri Railroad, Rolla, at the age of 22, was serving as manager of this system. That chapter covering the years 1878-1883 was an important one in the career of the man who was to serve two terms as Mayor of St. Louis and become a leading figure in business and banking circles.

The commendatory comments on Mr. Wells' success are shared by Col. A. T. Perkins, who served as general manager under the former's receivership and helped to make the partnership of Wells and Perkins an important one in transportation affairs in that city. Mr. Perkins, who retains a place on the board of directors, was an executive officer and engineer of various railways and adviser on terminal matters in many cities and served as manager for the receiver in St. Louis since 1919. He began his business career as a clerk in the service of the Chicago, Burlington & Quincy Railroad in Chicago in 1887. Colonel Perkins' announcement of his retirement from the office of general manager for the receiver effective Nov. 30, coincident with the retirement of Mr. Wells, was made by him personally in an address to an audience of employees at the Park Avenue station on Nov. 25.

Receiver Wells filed an affidavit with the Missouri Public Service Commis-

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sion at Jefferson City on Nov. 30 that he had complied with all terms of the federal court in the sale and transfer of the properties to the St. Louis Public Service Company. An affidavit was also filed by Walter Dew Bradley, secretary of the reorganization committee, setting forth that all details of the organization had been carried out and that the transfer of the properties would be consummated at midnight on Nov. 30. These filings were mere formalities to perfect the records in the office of the state commission and will be followed by a formal order of the commission transferring the rate schedules of the United Railways and its subsidiaries to the new owners.

L. E. Lippitt Leaves Railway Field

L. E. Lippitt, general manager of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., and former president of the American Electric Railway Accountants Association, has tendered his resignation to T. C. Cherry, president of the company, to take effect on Jan. 1, 1928. He will become associated with the Thermo-Ice Corporation, one of Auburn's new enterprises which manufactures and sells ice refrigerating machines.

Mr. Lippitt is one of the youngest electric railway executives in central New York State. His career began with the Oneida Construction Company, which electrified the West Shore Railroad between Syracuse and Utica. This line is now operated by the New York State Railways. He entered the employ of the New York State Railways in 1907, serving in various subdivisions of the accounting department.

Six years later he was appointed auditor of the Syracuse & Suburban Railroad and three years later became auditor-treasurer of the Auburn & Syracuse Electric Railroad under the management of Peck, Shannahan & Cherry, Inc. Mr. Lippitt was promoted to general manager on July 1, 1926, to succeed W. J. Harvie, resigned.

Mr. Cherry will take over the active management of the railroad as president and general manager on Jan. 1, 1928.

C. E. Smith Goes with New Haven Road

Charles E. Smith, consulting engineer of the city of St. Louis, who last September completed an exhaustive survey of the New York City transit situation for the Comptroller, has been appointed a vice-president of the New York, New Haven & Hartford Railroad. His duties will be to assist President Edward J. Pearson in problems relating to improvements, construction, operation and other matters. Mr. Smith's immediate responsibility, according to New Haven officials, will relate to the development of plans for meeting increasing traffic requirements, for better service to shippers and passengers, and for making such improvements as revenues and credits will permit.

Mr. Smith was born in Somerville, Mass., in 1877. He graduated from the Somerville High School in 1895 and the Massachusetts Institute of Technology in 1900.

The first engineering work done by Mr. Smith was in the summer of 1897, on the New York & New England Railroad, now part of the New Haven System, at and around Boston, and later largely on municipal and county road improvements, during the years 1898-1900. During the years 1900-1903 he was engaged in the bridge engineering department of the New York, New Haven & Hartford Railroad, with which, and its problems, he is already largely acquainted.

During the years 1907-1915 he was employed by the Missouri Pacific Railroad with headquarters at St. Louis for several years as chief engineer in charge of maintenance and construction. Subsequently, under the firm name of C. E. Smith & Company, he has been a consulting adviser to numerous railroads, city administrations, public utilities, industrial companies and for the last 12½ years as consulting engineer and technical adviser to the city administrations of St. Louis on railroad and public utilities matters.

Promotions in Byllesby Personnel

William H. Hodge, vice-president and manager sales and advertising department, Byllesby Engineering & Management Corporation, announces the appointment of J. W. Devereaux as manager merchandise division, T. P. Pfeiffer, manager advertising division; J. F. Gardiner, manager financial advertising, and J. W. Hicks, editor Byllesby publications.

Mr. Devereaux will supervise merchandising activities at all properties under the direction of Byllesby Engineering & Management Corporation. He has been connected with the operating department of the Byllesby organization for the past sixteen years.

Mr. Pfeiffer will supervise the advertising of the Byllesby Engineering & Management Corporation and the companies operating under its direction. He has been in the advertising department since 1922, and prior to that time was with the Louisville Gas & Electric Company for eight years.

Mr. Gardiner will be in charge of financial advertising for H. M. Byllesby & Company. He has been a member of the advertising department since 1922. For eight years previous he was an editor or financial writer for a number of the leading newspapers of the Middle West.

Mr. Hicks has been managing editor of *Byllesby Management* for the last two years. He also will edit the *Byllesby News Bulletin* and *Byllesby Monthly News*. For ten years prior to 1925, when he joined the Byllesby organization, he was engaged in newspaper work in the Middle West and on the Pacific Coast.

Alex Dow Heads Mechanical Engineers

Alex Dow, president of the Detroit Edison Company, Detroit, Mich., will succeed Charles M. Schwab, chairman of the Bethlehem Steel Corporation, as president of the American Society of Mechanical Engineers. Mr. Schwab retires after one year of service. Mr. Dow, prominent in the engineering world, a native Scotsman, who in 1895 became a citizen of the United States, has been a member of the society since his naturalization. He has been connected with the Baltimore & Ohio Railroad, the Brush Electric Company and other companies.

Charles G. Adsit Resigns from Atlanta Property

Charles G. Adsit, nationally known engineer, has resigned as vice-president of the Georgia Power Company, Atlanta, Ga., to enter private business. Mr. Adsit has been long identified with the Atlanta properties. He was made executive engineer on April 1, 1922, with authority and jurisdiction over engineering work of all departments and in May of the same year he assumed the rôle of vice-president.

Prior to his affiliation with the companies operating in Atlanta, he had extensive engineering experience in the western part of the United States, South America and Mexico. He was elected a director of the Chicago & West Towns Railway, Oak Park, Ill., early in the current year.

OBITUARY

FRANK J. GATRELL, superintendent of the department of accident investigation of the Chicago Surface Lines and one of the oldest officials in point of service, died at St. Francis Hospital, Chicago, on Dec. 4, after a short illness. He began his service with the claim department of the Surface Lines in 1894 as junior clerk and rose from that position to chief adjuster, general claim agent and finally superintendent of the department. He had a national reputation among claim agents and insurance companies.

PATRICK J. BOYLE, transportation superintendent of the Community Traction Company, Toledo, Ohio, died on Saturday, Nov. 19. He entered the service of the railway at Toledo 37 years ago as a driver of a horse car and later became a motorman when electric power was applied to the lines. His long experience made him unusually familiar with the property in Toledo and one of the most valuable members of the executive staff. The phrase "Call Pat Boyle" became the order of the day as a way out of most any kind of difficulty. Mr. Boyle was born in Ireland 67 years ago.

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Manufactures and the Markets

I.R.T. Needs 107 New Cars Now, Says Colonel Lancaster

At a hearing of the New York Transit Commission on Dec. 5 Col. William C. Lancaster, chief engineer of the commission, testified that 107 new cars were needed immediately by the Interborough Rapid Transit Company and gave as his opinion that 400 new cars would be needed by the company to meet its service requirements during the next two or three years.

Arthur G. Peacock, of counsel for the company, reserved the right to cross-examine Colonel Lancaster. Commissioner Lockwood of the Transit Commission put the matter over for two days.

Distribution of the 107 new cars was suggested by Colonel Lancaster as follows: White Plains Avenue line 40; Pelham Bay Park line, 30; Astoria line, twelve; Lexington-Fourth Avenue line, ten; Corona extension, six, and nine to be held in reserve.

Montreal Tramways Officials Inspect New Cars

Inspection of Montreal's newest type of street cars took place recently when the first of the 50 cars ordered last summer from the Canadian Car & Foundry Company by the Montreal Tramways, Montreal, Canada, were delivered. The order for these cars was forecast in the JOURNAL for Feb. 19, 26 and March 12 and the placing of it in the issue of Sept. 3.

Among those included in the inspection party were Julian C. Smith, president, and Col. J. E. Hutcheson, vice-president and general manager of the Montreal Tramways, and other officers of the company, as well as J. F. Saint-Cyr, chairman of the Montreal Tramways Commission, and Gustave Comte, secretary.

Of the two-man type, the cars have a seating capacity of 44 passengers and are 5 ft. longer than the one-man cars constructed last year. The space between the front facing seats at the head of the car is wider than in previous designs and there is a better arrangement of the motorman's section. This provides more space for passengers.

Some of the new features are that the cords running along the inside of present cars are dispensed with and the signal for the motorman to start is given electrically when the rear door is closed by the conductor. Should the motorman wish to signal the conductor a bell and push-button arrangement is provided. Aluminum rails run along the sides of the car instead of individual hand straps. Safety devices are one of the prominent features of the new cars.

The eighteen buses ordered some time ago cost from $14,000 to $18,000 each. Three of the new buses are of the "street car on rubber" Versare type. The operation is combined gas and electricity and the front of the bus is like the front of a street car with the motor and other equipment in the rear. The other fifteen buses are the regular four-wheel type, similar to those used on Sherbrooke Street.

Steel Tops for Some P.R.T. Buses

Philadelphia Rapid Transit Company, Philadelphia, Pa., it is reported, announced this week that all Penn-Jersey double-deck buses will shortly be equipped with steel tops over the upper open section. There is a possibility that double-deck buses on local lines eventually may be similarly equipped. The new inclosures allow more than 5 ft. headroom on the top deck. The sides of the new covers are equipped with ventilators.

General Prosperity Shown by Hoover's Report

EVERY previous record of volume of production and consumption in the United States and in the physical quantity of exports and imports was broken, according to the annual report of Secretary of Commerce Herbert Hoover. This report, released on Dec. 2, embodies interesting facts on the economic progress of the country in the fiscal year ended June 30.

There was very little unemployment, except during a moderate recession near the end of the year, and the rate of real wages remained higher than anywhere else in the world, or than at any other time in the world's history. The high prosperity of the year did not represent merely an upward swing in the business cycle, but was the result of that general and permanent progress the extent and causes of which are more fully set forth in the various sections of the report. There were a few aspects of American business which were less satisfactory, some of which were noticeable in the coal and textile industries, the relatively low price of cotton with its depressing effect upon the farmers of large regions of the South, and some continued depression in agriculture of the Mid-West.

The volume of output in the manufacturing industries, by all odds the largest branch of productive activity, showed an appreciable gain even above the extremely high level of the fiscal year 1925-1926. The most conspicuous gains shown, as compared with 1925-1926, are in mineral production, freight transportation, output of electric current, and sales of 5 and 10-cent stores. Electric current is being used in rapidly increasing quantities for lighting, for domestic power and heat, and above all for industrial power.

In the discussion of agriculture the situation of the farmer has an important bearing on the general trend of industry and commerce, according to the report. The crops harvested in the autumn of 1926, constituting the main factor in the agricultural situation of the fiscal year, were in the aggregate the largest produced in our history with the exceptions of the years 1915 and 1920.

The report states that the building and construction industries played a great part in the prosperity of the fiscal year. New construction undertaken in the fiscal year 1926-1927, amounting to some seven billion dollars in value, constituted a powerful factor in maintaining general business activity and prosperity.

Railway Efficiency Commented On

During the last two fiscal years a conspicuous increase has occurred in the volume of railroad freight traffic even as compared with the high figures for the fiscal years 1924 and 1925. The ton-mileage of freight in 1925-1926 was about 8 per cent greater than the year before, and 1926-1927 showed a further increase of about 5½ per cent. This gain in traffic was accomplished with an insignificant addition to the number of employees, a fact indicating the continued advance in the efficiency of the railways which has been going on since the close of the war.

Concerning motor transport it is brought out that the rapid increase in the use of motor trucks and motor buses in conjunction with older forms of transport has been remarkable, and this increase reflects to a large degree the rapidly changing conditions in modern methods of transportation and the progress made in highway surfacing. Sixty steam railroads have 1,253 buses in operation, covering 11,440 route-miles, while there are 19,099 buses operated in competition with railroads, the route mileage being 334,522. Electric railroads in 1927 were using 7,284 buses compared with 5,150 the previous year, common-carrier bus route mileage in-

Where Will the Next

A.E.R.A. Convention

Be?

The committee having this in charge will tell us on Dec. 16.

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creased from 232,340 in 1926 to 270,068 miles this year. The total number of buses in operation increased from 69,425 to 80,040 during the year.

The financial markets are but briefly touched on in this report. From the banking point of view, the fiscal year, like the calendar year, was one of sound but uneventful growth with ample money at low and stable rates.

Foreign trade, which is one of the principal phases of the Commerce Department, shows a very encouraging growth. The value of exports during the fiscal year 1926-1927 was greater than in any other fiscal year since 1920-1921, and when account is taken of the much lower price level, as compared with the war years, this past year was the greatest in our history.

There has been an extraordinary increase in the production of American industry during recent years with a consequent corresponding advance in the standards of living. This reflects not merely recovery from the dislocation caused by the war, nor from the low point of the post-war slump—it represents in large part an advance beyond the highest pre-war levels and marks a trend which we may well consider of a permanent character.

The basic causes of economic progress translate themselves into a number of more specific and directly working causes. Among these may be mentioned especially the advance in education, scientific research and invention; the growing use of mechanical power, machinery, and other forms of capital; the larger scale of production; the conscious and concerted effort to eliminate waste and reduce costs; the high scale of wages, with consequent general high buying power; and the relative stability of prices, money and credit.

In compliance with the new responsibilities assigned to the Department of Commerce by the passage of the air commerce act of 1926, providing for the promotion and regulation of civil aeronautics, the department's first task was to organize aeronautical activities and select the necessary personnel. These activities were assigned to five divisions, under the Director of Aeronautics and Assistant Secretary of Commerce provided for in the new act.

Copper Makes Further Advance

THE feature of the non-ferrous metal markets during the week ended Dec. 7 was the further advance in price of copper, accompanied by active business for both domestic and foreign accounts. Lead has also sold in excellent volume at somewhat higher prices. Tin has been firm and quiet. The one dull spot has been in zinc, sales being small and prices virtually unchanged.

Copper advanced nearly ½ cent per pound during the week ended Dec. 7. Three advances during the week seem only to have whetted the appetite of foreign buyers, and domestic consumers have felt forced to join the buying movement with the best grace they can muster. The successive advances in the c.i.f. price were as follows: on Dec. 2 from 14.05 cents to 14.25 cents, on Dec. 5 to 14.35 cents, and on Dec. 7 to 14.50 cents. The advances in the domestic market were made sooner by some sellers than others, which accounts for the range in prices for the individual days. Some metal was to be had the morning of Dec. 7 at 14.075 cents, delivered in Connecticut, but in the afternoon this seemed to have disappeared and some producers advanced their price to 14.25 cents.

Though lead prices underwent a sharp advance Dec. 1, there was no let-up in buying; in fact, demand for the next two or three days after the increase was made was better than it had been before. On that day, Dec. 1, the American Smelting & Refining Company advanced its contract price from 6.40 to 6.50 cents, New York, and the principal seller in the Middle West went to 6.325 cents, St. Louis, which was subsequently raised to 6.34 cents. The advance in London culminated on Monday, and with the lower quotations cabled from abroad Dec. 6 and 7 there was less insistent demand on this side.

In spite of the absence of any considerable demand, prices for zinc have remained steady. High-grade is still quoted at 7.75 cents New York, on a purely nominal basis.

Trading in tin has been moderate, with most of the interest on the part of the dealers. Prompt quotations apply also to December and January, later deliveries being about ⅛ cent less. Prices have averaged about the same as last week—about 59 cents for Straits.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Dec. 6, 1927
Copper, electrolytic, cents per lb.	13.825
Copper wire, cents per lb.	15.50
Lead, cents per lb.	6.50
Zinc, cents per lb.	6.20
Tin, Straits, cents per lb	59.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	.....
Central, Ill., screenings, Chicago, net tons.	.....
Kansas screenings, Kansas City, net tons	2.125
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.50
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal.	$0.55

Malleable Iron Fittings Company Acquires Bridgeport Concern

The Malleable Iron Fittings Company, Branford, Conn., has acquired the Clark-Williams Engineering Company, Bridgeport, Conn. The Bridgeport concern has manufactured and marketed pole mounts for application to telegraph, telephone and power transmission lines. The patented device comprises two heavy malleable iron castings which clamp the butt of the pole to a concrete base embedded in the ground. Rolland G. Williams, the inventor of the device, has joined the staff of the Malleable Iron Fittings Company, and the office of the Clark-Williams Engineering Company has been moved to Branford, Conn.

Twelve One-Man Cars for Knoxville Power & Light

Specifications have recently been released for twelve one-man, passenger, city type, single-end, double-truck cars which were ordered in November by the Knoxville Power & Light Company, Knoxville, Tenn., from the Cincinnati Car Company, Winton Place, Ohio. Mention that the cars would be ordered was made in the JOURNAL Nov. 5.

The units will have an over-all length of 43 ft. 9 in., total weight of approximately 30,000 lb., a seating capacity for 54 passengers and will be of semi-steel construction. The exterior color scheme will be yellow and cream and the interior trim cherry. Haskelite headlining has been specified, as have General Electric No. 264 motors.

Subjoined are the specifications as released by F. V. Underwood, general manager of the Knoxville Company:

Number of units	12
Type of unit	One man, motor, passenger, city, single end, double truck
Number of seats	54
Builder of car body	Cincinnati Car Company, Winton Place, Ohio
Date of order	Nov. 21, 1927
Date of delivery	Four months
Weight, total	Approximately 30,000 lb.
Bolster centers	24 ft. 0 in.
Length over all	43 ft. 9 in.
Length over body posts	33 ft. 6 in.
Truck wheelbase	5 ft. 0 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. 5½ in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Plain
Axles	3½ in. diameter
Car signal system	Faraday high voltage
Compressors	Westinghouse DH-16
Conduit	Duraduct
Control	General Electric
Curtain material	Pantasote, double-faced morocco
Destination signs	Keystone illuminated
Door mechanism	National Pneumatic Co.
Doors	End, folding, C-2320
Fare boxes	Cleveland
Finish	Old Dutch enamel
Floor covering	Battleship linoleum
Gears and pinions	13-74 ratio
Glass	Double strength American, set in felt
Hand brakes	Drop handles
Hand straps	White enameled metal
Heat insulating material	Cork and asbestos
Heaters	Consolidated Car Heating Co.
Headlights	Golden Glow, type RM-96
Headlining	Haskelite, ivory color
Interior trim	Cherry
Journal bearings	Plain
Journal boxes	3-in. x 6-in.
Lamp fixtures	Flush type
Motors	GE-264
Painting scheme	Yellow and cream
Roof material	Haskelite
Safety car devices	Safety Car Devices Company
Seats	Hale & Kilburn, 17 in. x 36 in.
Seat spacing	30 in.
Seating material	Green plush
Slack adjusters	Brill
Steps	Folding, 9½ in. x 36 in. treads
Trolley catchers	Ohio Brass
Trolley base	Nuttall U.S.-13-E No. 1224
Trolley wheels	5 in. with V. & K. harp
Trucks	Brill, 76-E1-x
Ventilators	Ten, Nichols-Lintern, type C
Wheels	Steel, 26-in. diameter
Wheelguards	H-B
Special devices	Treadle doors and steps and brake interlocking devices

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, December 17, 1927 *Number 25*

What Is a Modern Car?

REQUIREMENTS of the modern car have been discussed at length so often that it would seem there is nothing more to be said. Still, despite all the publicity that has been given to the subject doubt seems to exist in the minds of some railway men as to just what constitutes a modern car. For instance, the manager of a property recently approached his banker with a request for funds with which to purchase some modern cars for his road. The banker asked him to find out if he could obtain cars in the second-hand market that would be "just as good" as the new cars he wanted. Naturally this was discouraging, but the manager set out to prove that by no stretch of the imagination could cars cast off elsewhere be the equal of new ones for his own property.

Practically all the changes which have been incorporated in modern electric railway equipment have been included with the idea of making the cars earn greater profits, for after all the purpose of a railway is to earn a return on its investment, whether it is a private company organized for profit or a municipality pledged to give service to the community. The innovations are generally made to increase speed, safety, comfort and appearance. Some changes are primarily to reduce operating expense, but usually they cannot be considered apart from the others.

Four Essentials for Present-Day Equipment

WHILE the several elements that make for improvement in these various lines have been the subject of articles and editorials in this paper from time to time a recapitulation gives a means for the management of any property to check up and determine if its equipment really is modern.

Speed is a relative quantity. What is desired is not necessarily a high maximum velocity, but a high average from one end of the run to the other. This involves many elements. The car must be light enough in weight that a reasonable motor equipment can handle it. The motors must be sufficiently powerful to accelerate the car quickly and to maintain a reasonably high maximum speed. The structure must be strong enough to withstand the strains incident to a hard schedule. Brakes must be reliable and must give smooth and rapid retardation. So much for the movement. The modern car must also be designed to minimize the lack of movement, or standing time. There must be facilities for rapid collection of fares to prevent waste of time. For the same reason there must be effective control of passenger movement within the car. It must be easy for the passengers to board and alight quickly to prevent delays to car movement. This involves the design of doors and door mechanisms that work surely and swiftly.

Safety likewise demands full control of a number of elements. Efficient and reliable brakes have been referred to already, as have high quality of materials and correctness of design. The steps must be of proper height and width and there must be convenient arrangements for ingress and egress. Positive signaling systems are needed if two men operate the car and in any event there must be positive control provided to insure closing and unfailing action of the doors. Automatic protection of the passengers in the event of incapacitation or carelessness of the operators is now considered an essential.

Comfort demands attention to many details. The seats and the seating arrangement must be satisfactory. There must be ample heat and light and good ventilation. There must be freedom from roughness in handling the equipment. Proper facilities must be provided for the operator, and the automatic features must be simple and easy to work with. Arrangements to prevent crowding around the doors and in the aisles are also factors in promoting both comfort and safety.

Appearance, which is considered so essential today, requires good architecture and departure from conventional design. The latest models have low headroom and clear vision for passengers and operators, particularly the view ahead. Lines must be graceful, both inside and out. Unsightly apparatus either must be redesigned or concealed. Interior appointments must be good, the floor covering attractive and the accessories must harmonize with the design. A pleasing decorative scheme, both on the interior and the exterior, is essential. The signing should give the patron a means of choosing the right car without hesitation.

These features have their primary effect on the earnings of the car. It stands to reason that the parts should be designed for maximum efficiency in operation. The equipment should be easy of maintenance and it should need but little time in the shops, where it is unproductive. Anything that reduces the standing time of the car promotes speed, and in turn reduces operating cost per unit of service rendered. Safety features likewise reduce accident expense. Features that permit the use of one man instead of two reduce platform cost. Lightness of weight reduces the cost of energy, wear on track and paving and wear of the car itself.

Few cars so far designed and built embody all these desirable characteristics. Often pet ideas of the designer or of the operator militate against the attainment of all the best points in one structure. However, as the principles of modern design are becoming better and better understood there is a distinct trend toward the inclusion of more and more of the desirable features, with the result that the latest cars are far in advance of those built a few years ago. As to the financial results, the statements of many railways bear ample witness of their success.

This is the issue in December that is devoted essentially to maintenance and construction subjects

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Growing Pains

FOR the past several years the mass of workers on Chicago's transportation systems have been subjected to management policies and influences which have gradually permeated through to the lowliest platform recruit. Square dealing has been the first rule in that policy—square dealing flanked by sincerity and backed by courage and firmness. No compromise has been tolerated regarding the joint responsibility of management and labor to protect the public's interest. The principle has been firmly maintained that transportation systems are run to serve the public first and to earn a fair return to capital and labor second. The worker who would serve his own interests or gratify his own feelings at the expense of his patrons has been classed as an unfit employee for a public service company.

Management expects co-operation because it merely shares with the workers the responsibility of providing safe, dependable, efficient and courteous service. It insists upon obtaining this co-operation in full measure. In return it gives intelligent and expert direction, impartial justice, sympathetic understanding and courageous leadership. This is the creed that has gradually permeated into the ranks of Chicago transportation workers. In the day-to-day contacts between men and management, the principle of fair dealing has been put not so much into words as into action. So it was inevitable that deep-seated currents of readjustment should be set in motion.

New leaders arise to question reactionary labor thinking. Old leaders, failing to grasp the full import of new conditions, struggle to maintain their prestige and influence. Thus events which in themselves may confuse the casual observer are better understood when underlying forces and influences are perceived. For many years the mental attitude of Chicago transportation labor was far from healthy. Present symptoms indicate an acute case of growing pains.

Increased Attention to the Power Drives of Railway Shops Will Pay

IN THESE times of high costs for labor and materials, electric railway managements are interested in anything that will reduce expenses. One thing that has not received the attention that it deserves is the mechanical power drive used in shops.

If railway shops were part of an industrial plant, experienced mechanical power transmission engineers would be engaged to make certain that shafting is in accurate alignment, that pulleys are of proper size to develop highest efficiency for the individual machine tools, that belting is of a class to give longest service with low maintenance cost and freedom from interruptions, that all excessive slippage is eliminated, that modern lubrication practice is followed and that excessive friction from plain bearing transmission equipment is avoided. Since by some persons railway shops are thought of as only repair shops, little attention is given by them to the factors that enter into efficient mechanical drive. As long as a machine tool will operate at a speed somewhere near what is expected the drive is assumed to be all right.

To show how easy it is to let bad practices creep in, a recent inspection by a belting engineer in one shop showed that there was a power loss of nearly 50 per cent between the driving motor and the group of machines served. A few very simple changes brought the efficiency up to normal.

Nearly every electric railway shop has a wood mill, where there is an accumulation of dust. Dirty belts have excessive slippage and as a result there is rapid wear of the belts themselves and of the pulley faces. Belts used in such a place should have a tension higher than normal, or else there should be large arcs of contact on the small pulleys to prevent slippage. A common method of obtaining a large contact arc is by use of a gravity idler. Composition pulleys sometimes help reduce slippage. Where an accumulation of dust cannot be prevented on belts it is especially necessary to consider the quality of the belt material used, as long life and low maintenance cost can best be obtained by having a pliable, tough and strong belt. The type of fastening used for belts is also an important factor in preventing interruptions.

Enforced idleness of a machine at a time when it is urgently needed may cause a car to be held in the shop much longer than otherwise. Its earning power is thus decreased, although the fact may not be known to the management. It should be the duty of the shop foreman to show just what is needed to get production standards in the shop up to the most economical point, and specifically to point out conditions that he cannot remedy with his own forces.

In looking for additional opportunities to decrease costs during the coming year general managers will do well to have conditions of the mechanical power transmitting equipment in shops investigated and make desirable changes.

Many Important Considerations Enter Into Comfortable Seat Design

COMFORTABLE seats in cars are essential if passenger riding is to be increased. Until a few years ago electric railways gave little consideration to this most vital question. A seat which would not wear out and which reversed satisfactorily if used for double-end operation, or stood up rigidly for single-end operation, was good enough. Some of the blame for this indifference may be laid to the manufacturer, but operators did not take readily to the idea of providing comfort for the riders, particularly when it was found that improvements would increase costs.

At present there is somewhat of a tendency to go to the other extreme without thought of longevity and ease of maintenance of the seat itself. Many of the experimental seats installed may be classed as comfortable, but freedom from maintenance trouble appears to have been given insufficient consideration.

A high seat back that provides a head rest for the passenger, even though correctly designed, is not necessarily comfortable, because all too often the rider cannot take the proper position due to too close spacing of the seats themselves. A cushion can be soft and yet uncomfortable, particularly if care is not used in determining the height above the floor. Cushion heights from 19 in. to even 22 in. are used too commonly, when a 16½-in. to 18-in. height should be a maximum. To use the lower height satisfactorily, study should be made of heater side wall and design of the car in relation to the seats themselves.

If it becomes necessary to replace seats in a few years, the cause of comfortable seating will get a setback, but this is inevitable unless great care is used in securing a seat that is not only comfortable but is so ruggedly

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constructed that it will stand the severe service required and do so without excessive cost of maintenance. Seats for passenger cars cannot be built like parlor furniture and be expected to stand up in service. The springs should be tempered so as to give proper deflection without taking a set and the spring units should be designed and constructed to give an absolute minimum of upholstery deformity. Many years have been spent in studying upholstery foundations for car service. The lessons learned should not be disregarded.

Comfort in seats has emphasized the necessity for use of softer covering. Canvas-lined rattan unquestionably is an excellent covering for withstanding wear. It is easy to maintain in a presentable condition. This covering, however, is being replaced to a great extent by plush and genuine leather, although recently soft and comfortable seats have been designed to utilize the excellent qualities of rattan in combination with leather or plush. For certain kinds of service this combination works out satisfactorily.

O'Fallon Case Did Not Decide Valuation Basis

NOT until the Supreme Court of the United States passes upon the matter will the so-called O'Fallon railroad valuation case be settled. In the decision just rendered, the Federal Court for the Eastern District of Missouri sustained the order for recapture of earnings issued against the O'Fallon road after modifying it in one particular. The court held the commission's determination valid with specific reservation that the methods used in arriving at a value on which the per cent of earnings is calculated should not enter into the case. The two circuit judges, Kimbrough Stone, who handed down the decision, and Arba Van Valkenburgh, agreed on this point. The district judge, Charles B. Faris, concurred in the judgment, but expressed the opinion that the commission's valuation method was justified, although defective in some particulars. The two circuit judges held it unnecessary to go into the basis of valuation or the question of confiscation, because the road earned more than 6 per cent on the full valuation claimed by it. They said that under such circumstances a claim of confiscation could hardly be made. The decision read in part:

> It seems that the contention of the United States is well founded; that the verity of the commission's valuation herein need not be examined and cannot affect the recapture order, and that therefore such order is not open to attack upon the grounds of wrongful valuation. If this be true, it is unnecessary to examine and determine the various contentions made by the parties and *amici curiae* concerning the proper manner of ascertaining value hereon.

In his comments, Judge Faris said that a valuation arrived at by the sole use of either the "prudent investment" theory, based on the cost when constructed, or on the present cost of reproduction new less depreciation, would work presently to the public and eventually to the carriers themselves such monstrous iniquity as to preclude wholly the use of either of such methods exclusively, and would eliminate the notion that Congress contemplated the exclusive use of either of such methods.

Summed up, the court held that 6 per cent upon the value affixed by the commission on the O'Fallon property, plus one-half of what it termed "excess earnings" for the several years considered, taken together, constitute a fair return upon the value of the property even as claimed by the carrier. The court thus saw no necessity for concerning itself with the commission's valuation or with the method of the commission in reaching its conclusion.

The Theory on Which the Commission Acted

THE O'Fallon case was the first decision by the Interstate Commerce Commission interpreting and applying the so-called recapture clause of the transportation act of 1920. Since no definite rule of valuation was laid down in the transportation act of 1920, the commission proceeded on its own initiative. By a vote of 6 to 4 it held in effect that the value of the property for rate-making purposes, as determined by the commission for 1914, approaches more nearly the reasonable and necessary assessment on the property than the cost of reproduction of it. It felt warranted in basing the valuation on its tentative valuation figures of 1919 (based on 1914 unit prices) as far as available, allowing for property added in succeeding years at actual cost less depreciation, without giving effect to the cost of reproducing the original property at present-day prices. The idea of cost of reproduction new at prices current on the valuation date, laid down as a rule in previous court decisions, was rejected by the majority of the commission on the ground that it would prevent stability of rates and that it was unjust and unworkable. Between that method and the use of 1914 prices as a base, the commission held no intermediate practice was "possible which is capable of being applied to any rule independent of the caprice of those who apply it."

The theory upon which the commission justified its adoption of 1914 prices appears to be that that price level is one which will be fair to all concerned. The idea of the commission seems to be that if the carriers are protected in their right to earn a fair return upon a value for physical property so determined, with some allowance for going concern value and working capital, fixed in the discretion of the commission, the roads will have no ground for alleging confiscation and will have received all the returns that can justly be claimed by owners of property who have voluntarily dedicated it to the public service.

These comments, it is believed, summarize the various points of view of the commission and the court correctly. So far as the railroads are concerned, the opinion of the general counsel of the Association of Railroad Executives is to the effect that even admitting that the road might be receiving a fair return upon its own valuation figures, the decision had the effect of preventing the road from receiving a return as great as Congress deemed it entitled to receive. The feeling of the railroads appears to be that the court decided the case without consideration of the correctness of the value placed by the railroad on its own property.

It is understood that the Supreme Court will hold an open session on Dec. 19 to consider motions for perfecting an appeal. It is expected that in that proceeding the issue will be decided of whether the highest court will finally direct the commission to give greater weight than it appears to have done to the present reproduction cost as one of the criteria of values and perhaps also whether it will direct the commission to accompany its findings of value with a definite statement of the manner in which it gave weight to reproduction cost. Should the court by chance decline to pass upon the valuation and confiscation questions and affirm this adverse ruling the railroads would be back where they started.

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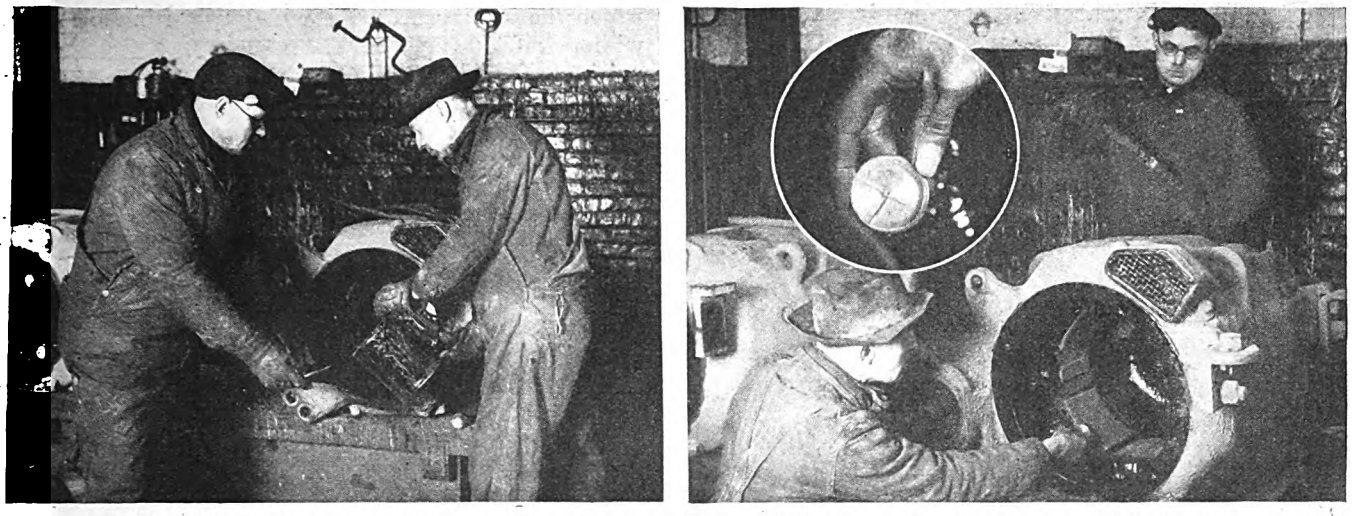


At left, heated insulation compound is poured into the motor frame, which is rotated so that the compound fills all corners and inaccessible places. At right, polarity of the fields is checked by a compass

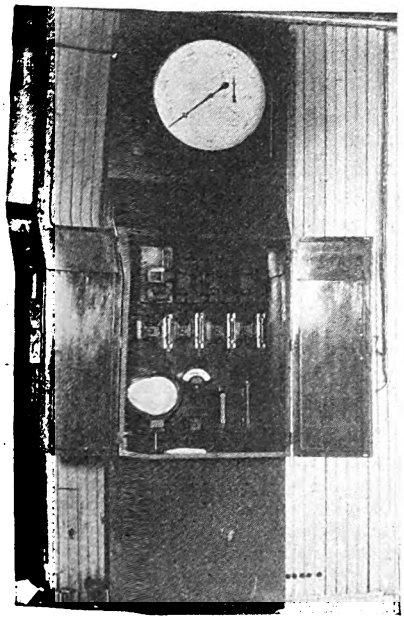
Special Devices

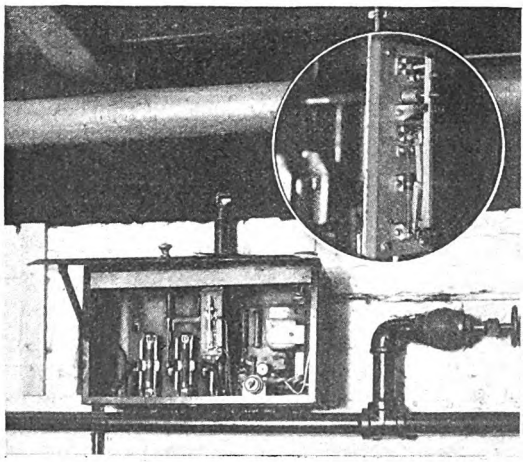
IMPROVE MAINTENANCE

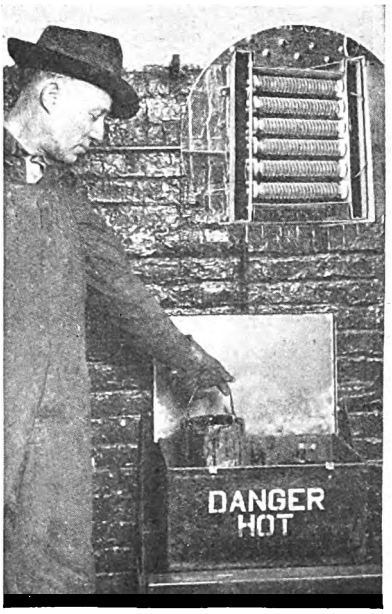
in Chicago Shops

MANY improvements made recently in shop practices and equipment of the Chicago Surface Lines have resulted in greater efficiency and output and reduced maintenance costs. On a system the size of the Chicago Surface Lines shop work is important. Many details of maintenance practice and equipment are given in the company's brief for the 1927 Coffin Award. In the two principal shops of the system there are 34 persons in a supervisory capacity and 978 employees. In the repair and cleaning departments of the car stations there are 64 supervisors and 1,361 employees, making a total of 98 in supervisory positions and 2,345 employees. Some of the shop practices are given in the following paragraphs.

In overhauling motors one of the first operations is to remove the armature. Considerable time and labor have been saved in the removal of armatures from box frame motors through a special device built in the shops. It consists of a hinged tripod, two legs of which hook into the motor commutator cover hole, while the third leg hooks into the bottom inspection hand hole. Pressure on a jack placed between the apex of the tripod and the end of the armature shaft causes the armature to push the pinion end bearing housing from its seat, after







The clock (at left) controls four heat circuits. The switch (above) controls oven temperature. The insert shows details of the switch.

Heater units (at right) are placed below plates which support containers for insulating compounds. One of these units is shown in the insert.

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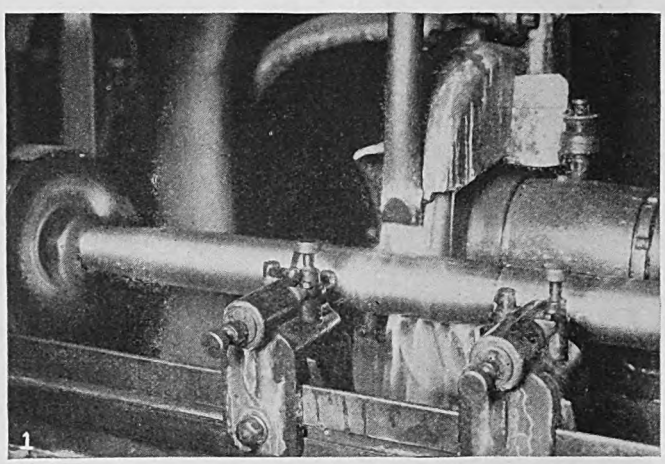
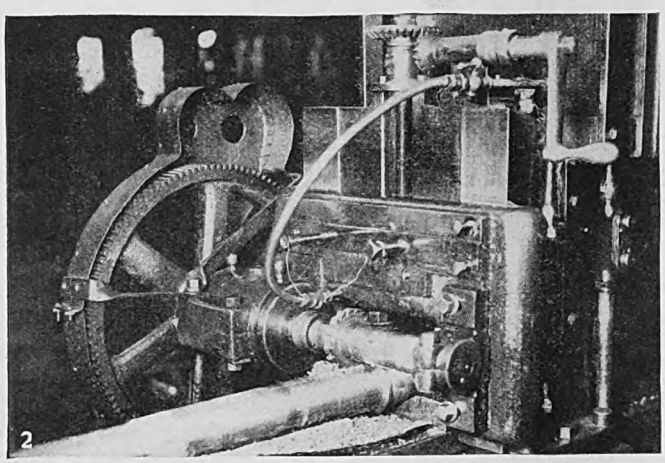
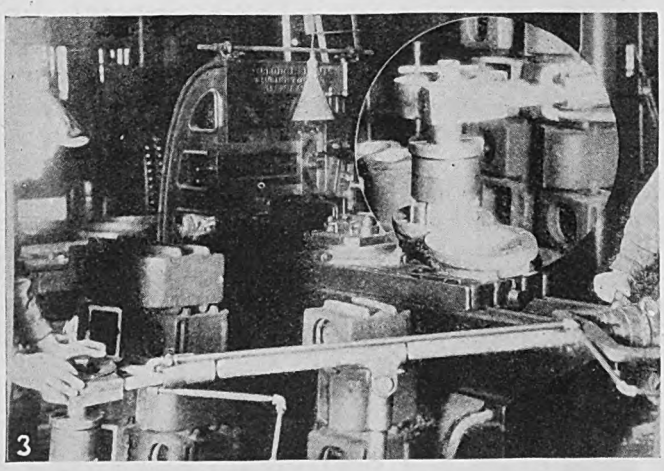
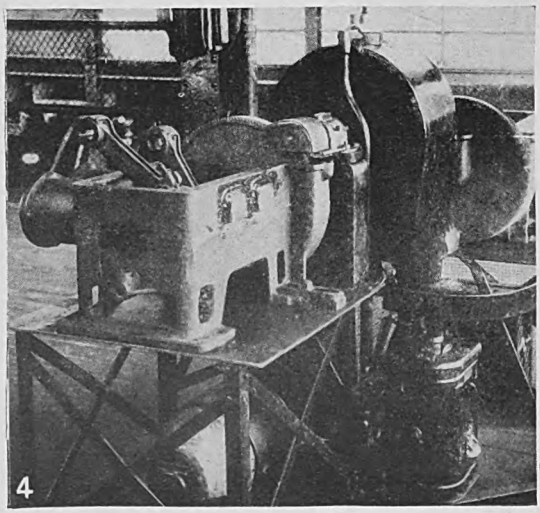




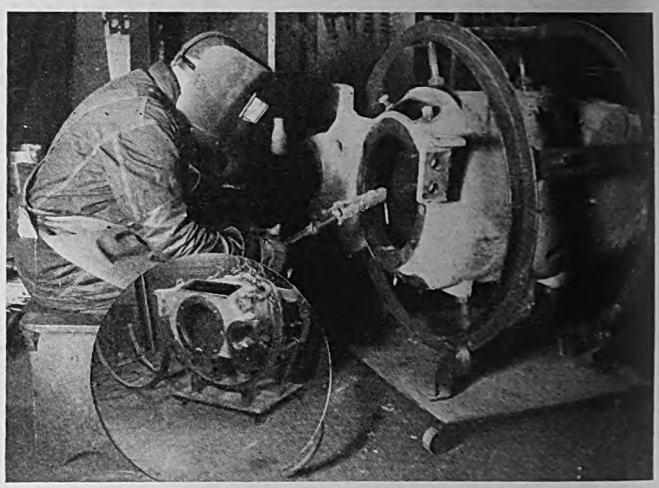




which the armature can be withdrawn from the frame without difficulty.

The practice of dipping and baking armatures is carried out very carefully. It has been followed since 1922 and extensive facilities have been provided for the care of the 12,000 armatures used by the system. Details of some of the baking oven equipment by which the capacity was increased considerably were given in ELECTRIC RAILWAY JOURNAL for March 20, 1926. The method of storing armatures during baking so as to get a maximum number in a limited space is a particular feature. Clamps for handling armatures by the overhead rail conveyor system with chain hoist have assisted materially in rapid handling and also in reducing the amount of labor necessary.

Control of the oven temperature at the South shops of the railway is by means of a seven-day clock and contactor panel. The clock controls four heat circuits. Three sets of heaters are turned on at 4 p.m. and off at 6 a.m. each day except Saturday, while the fourth is under thermostatic control during those hours, so that it cuts in and out as the temperature varies in the oven.



Circular fixture for supporting motor frames during welding

At the West shops of the company three circuits of heaters are used, two being under thermostatic control established through a contactor and quick break switch, actuated by a length of No. 00 copper trolley wire placed at the top of the oven and anchored at one end so that all expansion must take place in one direction. As the temperature rises the expansion of the rod causes the switch to operate at a predetermined point. This control and quick break switch are of shop design and manufacture, but have been found more reliable than some other types of thermostats.

Insulating compound is also used on the inside of motor shells. For heating this compound an electric heater made of six 1,000-watt heater units has been placed below plates which support the compound containers. The heating compound is poured into the

Equipment used to finish armature shafts and make air brake repairs

1. A Landis grinder finishes the armature shaft to required size.
2. After threading for the pinion nut, keyways are cut.
3. A special reaming attachment is used to recondition air compressor cylinders that have become worn out of round or tapered.
4. Machine for running in crankshaft bearings.

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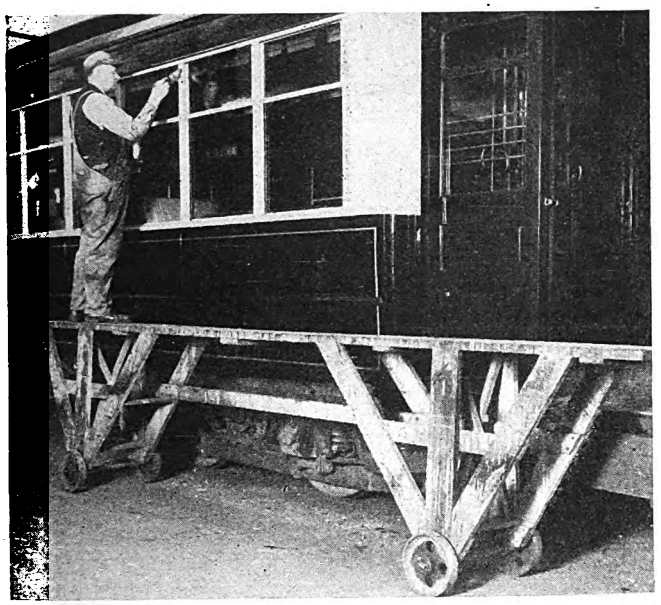
motor frame. By rotating the frame about its axis the compound fills and insulates corners and surfaces that are inaccessible to a brush. A system of taps and switches has been devised so that the same current used in the compound heating element can be used in the testing of polarity and insulation of the motor. Polarity of fields is checked with a compass.

Where the housing fits in railway motor frames are worn it is the practice to build these up by welding and then to rebore them. To assist in handling the motors conveniently while welding a special fixture has been constructed. This consists of a circular cage formed from a hinged framework mounted on a truck with small roller castors. The motor in its cage can be hauled about to a convenient location for welding and also transported for assembling. To place a motor case in the cage the upper half is swung back on its hinges

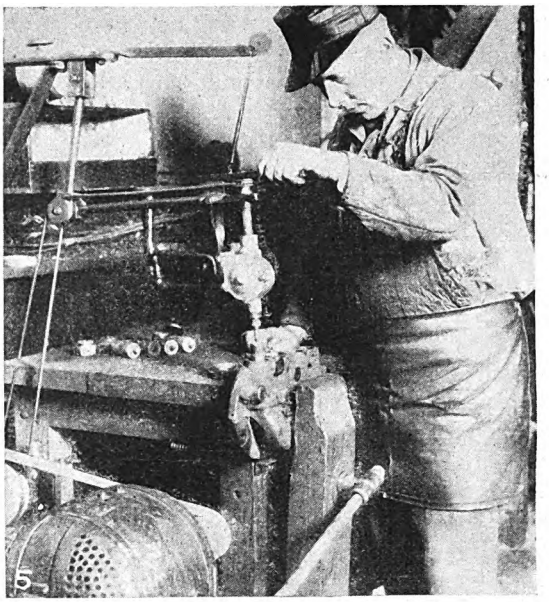


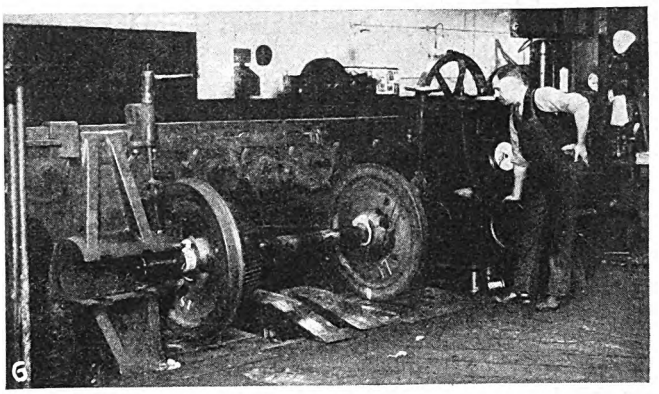
Low portable scaffold used for painting the upper parts of car body sides

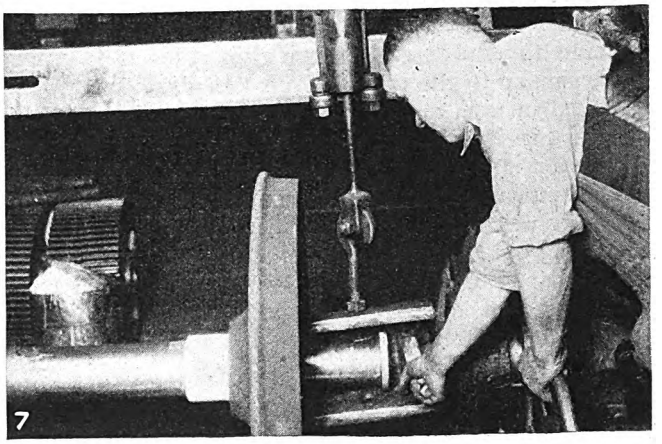
and the motor is placed in the lower portion. The top part is then closed into position and the clamping studs around the outside are adjusted to hold the motor rigidly. The cage rests on rollers at the bottom so that it can be rotated with the motor case inside. It is thus possible for the welder to place this in any convenient position and the welding work is not hampered through the operator having to work in a cramped position.

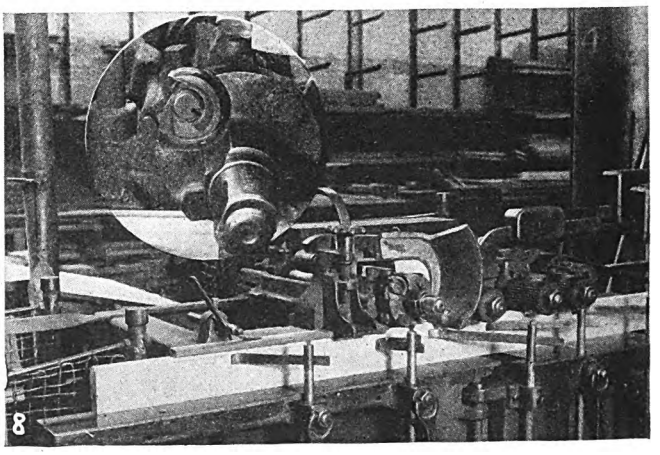
After welding, the motor frames are rebored in a twelve-tool boring machine, which is essentially a four-spindle horizontal boring mill. The four spindles are grouped in pairs of two in such a manner that all four bores are completed at the same time. Speeds can be adjusted to suit the thickness and hardness of the welded material in each built-up frame.

Armature shafts are turned out on a production basis in the Chicago shops on a group of machine tools. The rough shafting is first centered and then rough-turned









5. Intake and exhaust valves are seated by power grinding.
6. This wheel press is arranged so that two wheels can be pressed on the axle at the same time.
7. A special U-shaped block is arranged so that the thrust is taken by the hub of the wheel instead of by the end of the axle.
8. Door stiles and rails are formed in a machine with two horizontal spindles.

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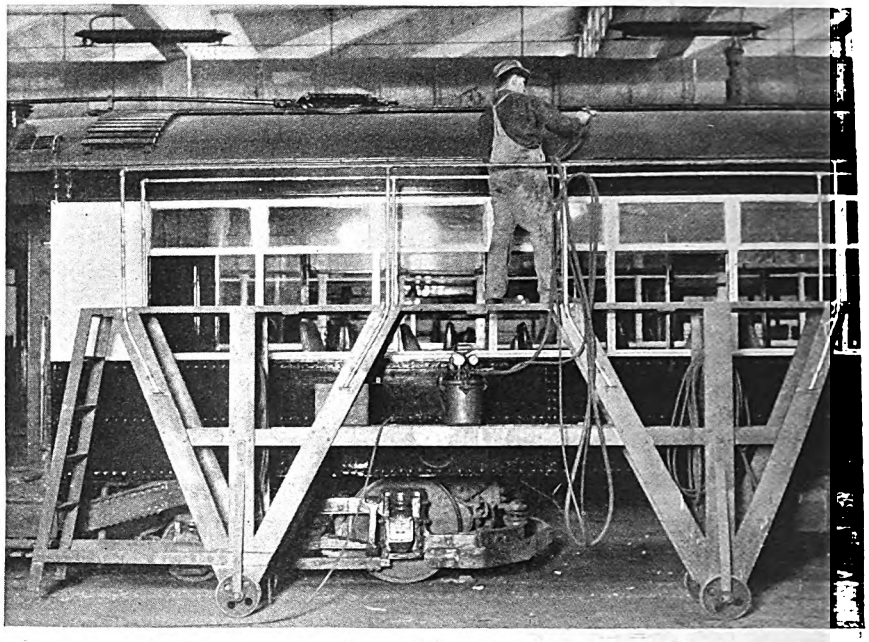
in an ordinary heavy-duty engine lathe. Finished turning is done in a low-swing lathe which has multiple tool posts. The saving in time resulting from the simultaneous use of four, five or six tools, combined with the use of cooling fluid, greatly reduces the cost of manufacture. A Landis grinder finishes the shaft to the required size. Finally, after threading for the pinion nuts, the keyways are cut.

All armature shafts are made of chrome-nickel steel. With this material, which has been the standard of the railway since 1921, breakage of shafts has been practically eliminated.

In the compressor overhauling department new rings and pistons are fitted to compressors until the bore has reached $\frac{1}{16}$ in. oversize, at which time a sleeve is fitted to bring the cylinder back to standard. Cylinders worn out of round or tapered are refinished with a special reamer. It has a micrometer adjustment and a true, smooth surface is secured. After a crankshaft is fitted the shaft is run in the bearings with a special machine. Two compressors can be run in at one time. Besides running the bearings, the machine is used to check the tightness before the motor is assembled. A power grinding attachment arranged for seating intake and exhaust valves has proved a great time saver and produces accurate work.

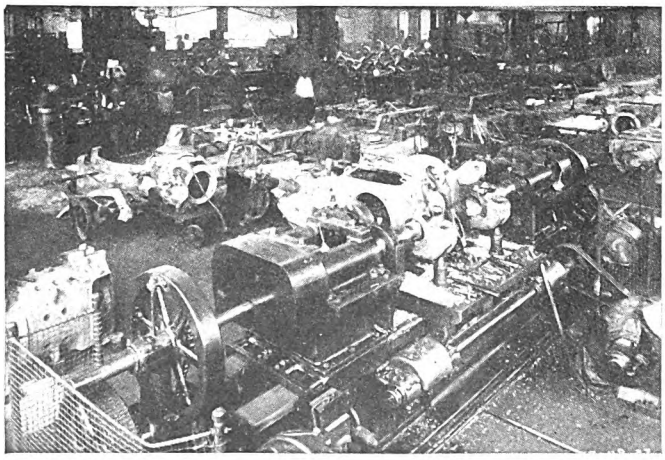
The wheel press used in the Chicago shop is so equipped that two wheels can be pressed on the axle at one time. The new equipment required to adapt the machine to double end pressing includes a U-shaped block similar to the one used on the piston end. This is placed in such a way that the thrust is taken by the hub of the wheel instead of by the end of the axle. Whenever it is found that the fixed end wheel will be pressed on farther than the gage mark on the axle before the other wheel is in its proper place an emergency stop, consisting of a block of iron, is slipped into a groove in the U-shaped fixed stop, after which the thrust is taken by the end of the axle and the second wheel can be pressed into place. If the piston end wheel arrives at its place first the iron block is placed between the piston and the axle end and the pressing on of the other wheel is completed. This procedure increases the production of the press by 90 per cent.



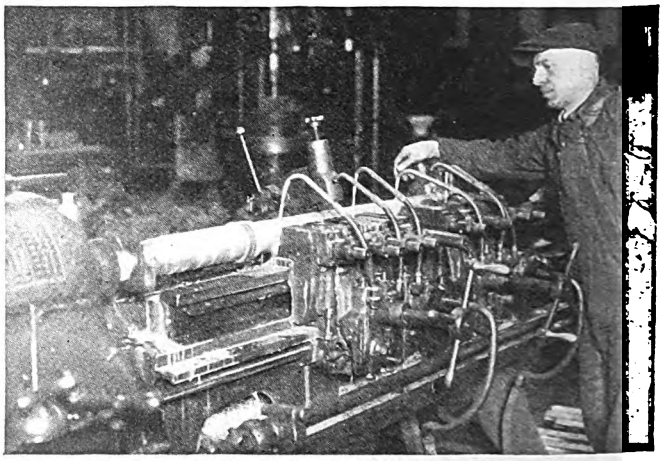
High type scaffolding used for spray painting roofs of cars

Many improvements in methods and equipment have been made in other shop departments. In the wood mill the edges of door stiles and rails are formed in a machine with two horizontal spindles, using shimer head cutters so that both edges of a piece passing through can be finished at the same time. Presses have been constructed to give pressure to vestibule corner posts and other large members after they have been glued. These presses hold the parts in position firmly until the glue can set. An improvement in platform flooring has been made through the use of an improved type of tongued-and-grooved flooring. A special machine is used for cutting this. This type of flooring gives much longer life than the usual type. Repairs to seat cushions are made without removing any part of the seat by the use of a special staple driver. An accompanying illustration shows its construction and use.

Work of painting the sides of cars has been facilitated greatly through the use of several types of rolling plat-



Twelve-tool motor frame boring machine used for finishing after welding



Shafts are finish turned in a low-swing lathe with multiple tool posts

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forms. These platforms are made of different heights so that workmen can reach all parts readily. They are mounted on large wheels so that they can be pushed along by the workmen without getting down from the platform.

An average of 4,870 cars are given a general washing each week on the Chicago Surface Lines. To aid in this work a fountain brush has been designed. It is so arranged that water is sprayed through the brush bristles directly on the car surface. Dirt is loosened with the brush and the steady flow of water flushes off the loose dirt. Care has been taken to prevent the use of water at higher pressure than necessary to secure a uniform flow through the brush. This prevents the entrance of water into cracks or crevices of the car and prevents the deterioration which is usually experienced where high pressure cleaning systems are used. Low pressure water also makes working conditions for the men more comfortable.

But four men are required to clean a car. Long and short handles are supplied to the fountain brushes and a special brush is also used to clean the glass behind the window bars. Periodically the cars are given a thorough interior cleaning and are swept and dusted after each day's run.

The care used in inspecting and purchasing repair parts which go into cars is illustrated by the attention given to securing uniform heater coils. To make certain that all coils have the correct resistance for the circuit in which they are used, independent of the resistance of the wire purchased, a special testing equipment is used which is an adaptation of the Wheatstone bridge in which a known resistance is balanced against the heater coil being tested. The known resistance is a standard heater coil. Coils are wound on a mandrel and are cut to such a length that the resistance will balance with that of the standard coil. In the illustration on page 1092 showing this test equipment a dry cell furnishes the electric current. The galvanometer to show when a balance is obtained is at the top of the board and the coil under test is around the outside.

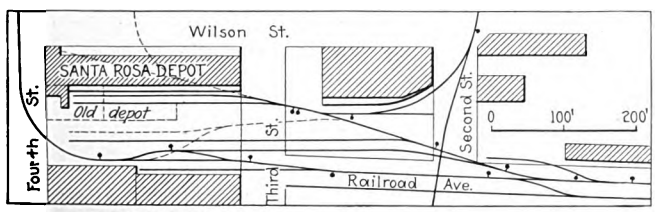


Diagram showing old and new locations of depot and tracks

Attractive Depot Completed at Santa Rosa

COMPLETING a new combined passenger and freight depot, costing approximately $30,000, the Petaluma & Santa Rosa Railroad has given to Santa Rosa what is said to be one of the finest depots in northern California. This road operates an electric interurban in Sonoma County between Petaluma and Santa Rosa via Sebastopol and a steamboat line on San Francisco Bay between San Francisco and Petaluma.

Of modernized mission style of architecture and tastefully decorated, it is a distinct improvement over the former structure. It provides for the traveling public a commodious waiting room and ticket office separate from the freight warehouse. The building has a frontage of 84 ft. on Fourth Street, one of 270 ft. on Wilson Street and a total floor space of 25,000 sq.ft.

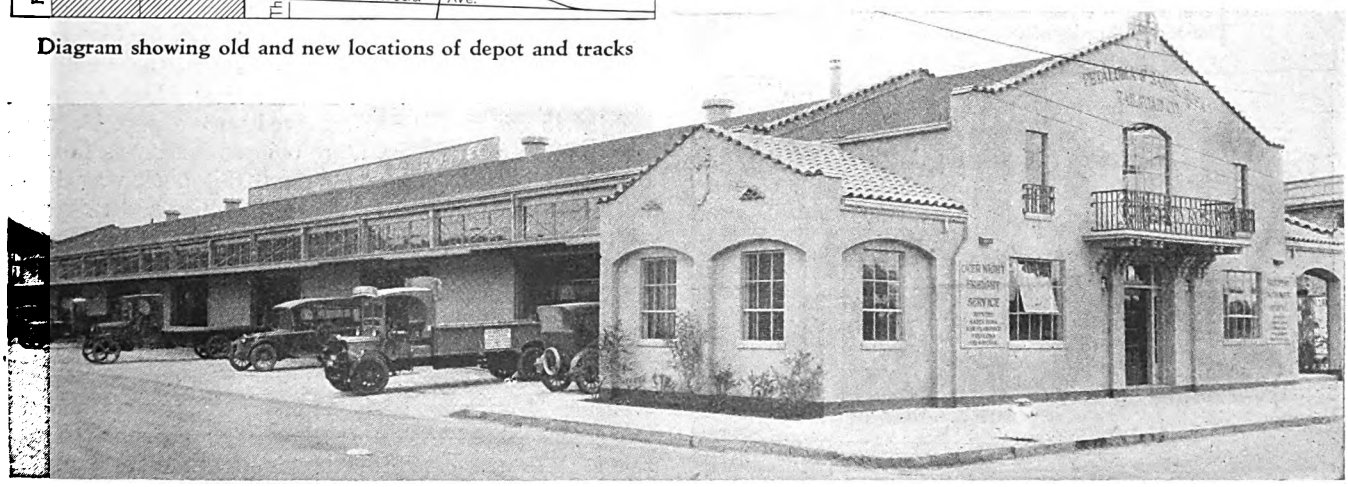
The passenger end of the depot, with its entrance on Fourth Street, the principal business street of Santa Rosa, is constructed of reinforced concrete, with a stucco finish and tile roof.

The adjoining freight warehouse, devoted entirely to the receipt and delivery of l.c.l. freight, has a 270-ft. frontage on Wilson Street and a 47-ft. frontage on Third Street. Inside dimensions are 40x250 ft. The floors of the warehouse and the 7-ft. platform on the car side are of concrete. The vehicle-loading side is fitted with Cahill roller steel doors, 16 ft. wide and 12 ft. high, and has a 4-ft. marquee extending the full length of the building. A concrete drive, also the full length, adjoins the paving of Wilson Street. The opposite side is served by two tracks, each having a five-car capacity.

The change in location necessitated a complete rearrangement of the tracks. The accompanying diagram shows the present arrangement in solid lines and tracks removed in dotted lines. Driveways and track changes cost $10,000.

Before the contract was let the railroad company prepared for building by tearing up the tracks and getting everything in readiness for construction, so that there was no interference with the business of the company and service was given as usual while the work was in progress.

W. G. Rennison, chief engineer of the company, supervised the construction of the station and all changes made in the track and driveways.



New Santa Rosa depot of the Petaluma & Santa Rosa Railroad is of modernized mission architecture

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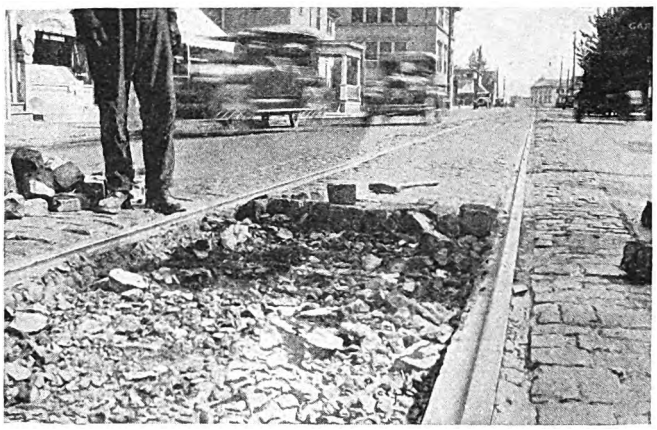
Asphaltic Concrete

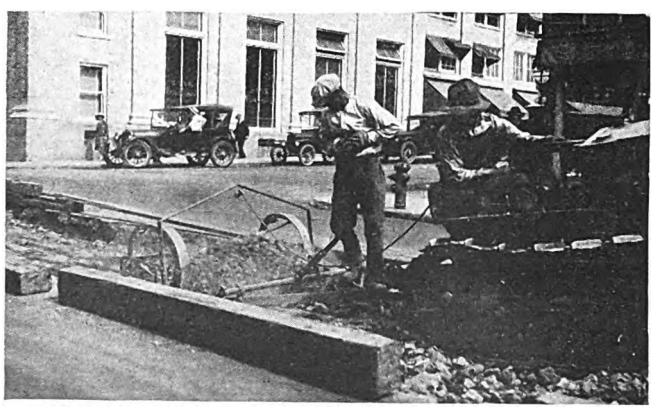
Used in Oregon City Track Reconstruction

Street before reconstruction work was begun



Stone block surface being removed from track area

The street after the ties and rails had been removed. The large chunks of concrete were salvaged



Excavating the trench with a caterpillar tractor and Fresno

The material was loaded into trucks with a clamshell bucket

RECONSTRUCTION of 2,300 ft. of the main line street car tracks through Oregon City, Ore., proved a difficult problem for the Portland Electric Power Company, owner of the local street railway system. The line carries a considerable quantity of freight to the paper and woolen mills in addition to handling the regular interurban passenger service between Oregon City and Portland. The main business district of Oregon City lies on a narrow bench between a high bluff and the Willamette River, and practically all vehicular traffic must pass over Main Street, on which the railway line is located. The track and pavement had deteriorated to such an extent that it was decided to rebuild the entire structure. Because of the heavy traffic, both vehicular and rail, it was necessary to complete the work in a minimum period of time. The subgrade of Main Street, composed of poorly drained subsoil, offered another problem to solve.

The method of reconstructing the old track, as outlined in an article in *Construction Methods,* is very interesting. The old Belgian stone block surface in the track area was removed and salvaged. The ties, which were imbedded in concrete, were removed with a portable crane mounted on a truck. A large pointed hook was fastened to the end of the crane cable and this hook was driven into the ties with a sledge. After the ties and rails were taken out there was left a mass of loose material to be removed. The large chunks of concrete, which may be seen in an accompanying illustration, were salvaged and later used for riprap. The trench was excavated with a tractor and Fresno, starting at one end of a section, dumping at a predetermined point, continuing down the trench and bringing back material. The waste material was then loaded into a truck with a clamshell bucket crane. The completed trench was slightly more than 8 ft. wide and 21 in. deep, a template being used to obtain

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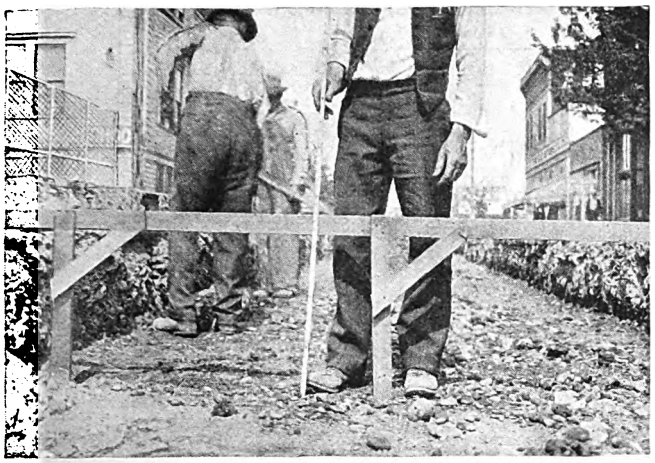


Obtaining a uniform thickness of 21 in. with a template

a uniform thickness. The subgrade was finished by compacting with a roller.

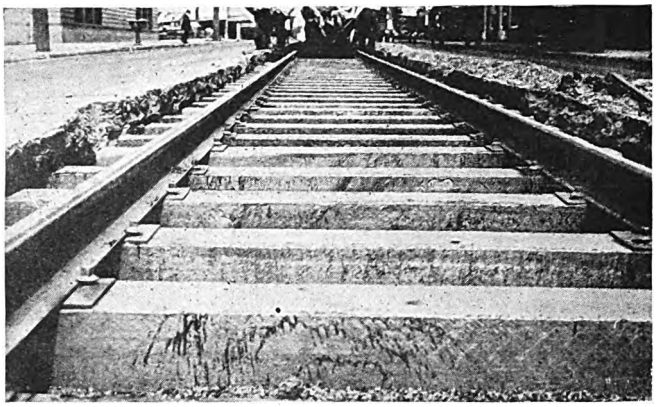
On this subgrade an asphaltic concrete base approximately 8 in. in thickness was laid. Large aggregates were used in the material, which was laid in two courses. Over this base a thin layer of screenings was spread, on which the new track was placed. The track was brought to grade by working the screenings under the ties where necessary. The space between the ties and under the rails was then filled with asphaltic concrete base mixture, hand tamped into place. The rails were painted and another course of the base mixture laid above the ties. On this second course the surface pavement was laid, bringing the wearing surface to final street grade.

In making the asphaltic concrete, the maximum density type of mixture was used throughout. In the base course a fairly large-sized rock was used, the maximum being

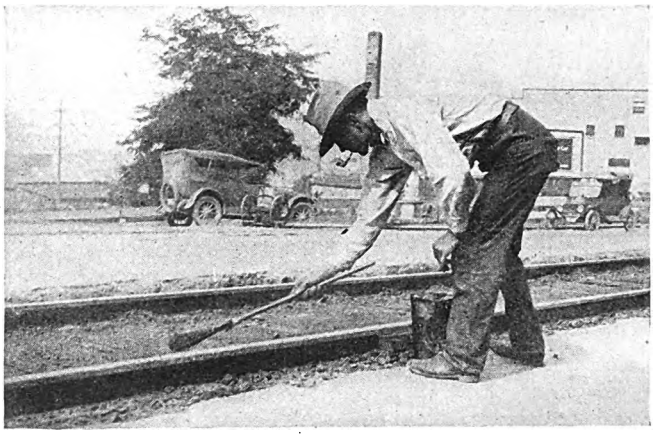
The finished asphaltic concrete base. A coating of fine screenings was spread over the base course

2½ in. In the surface course ½-in. maximum sized rock was employed. Asphalt of 51 to 60 penetration was used in the mixture, the base courses carrying approximately 4.5 per cent and the surface courses carrying approximately 6.7 per cent.

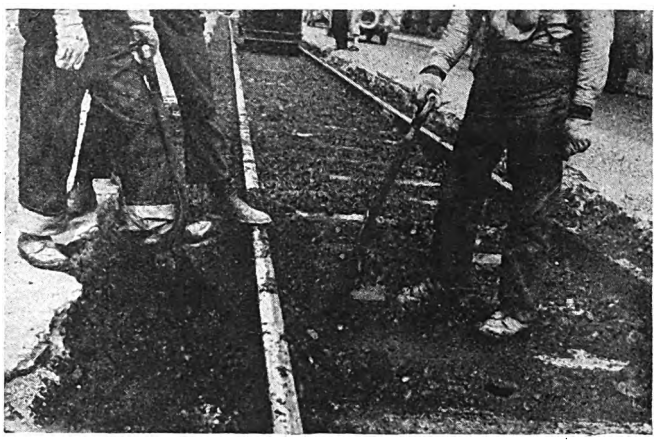
The work was done under the supervision of Thomas Pumphrey, chief engineer of railways for the Portland Electric Power Company, working with J. R. Stafford, city engineer of Oregon City. The contractor was the L. O. Herrold Company.



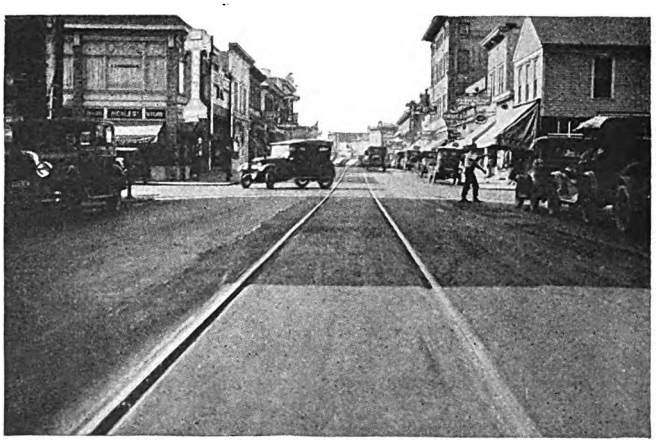
The ties and rails were then laid and the track brought to grade



Painting the rail before laying the black base on top of the ties



Tamping the black base mixture into the space under the rail



The completed wearing surface

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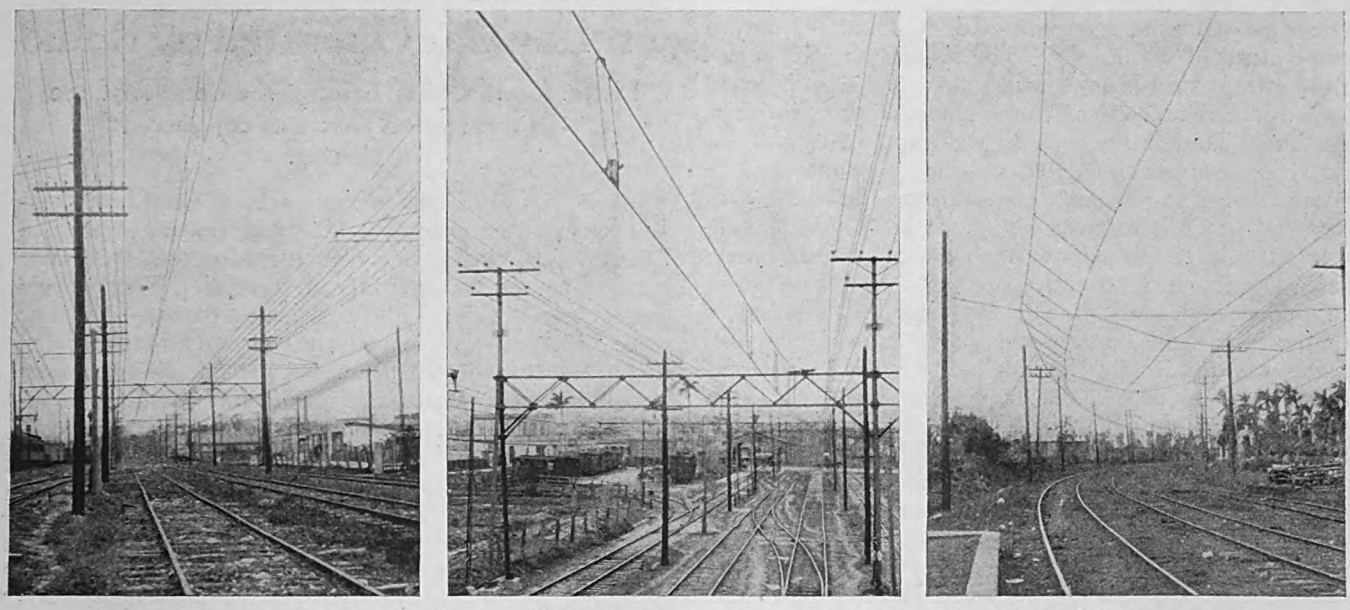


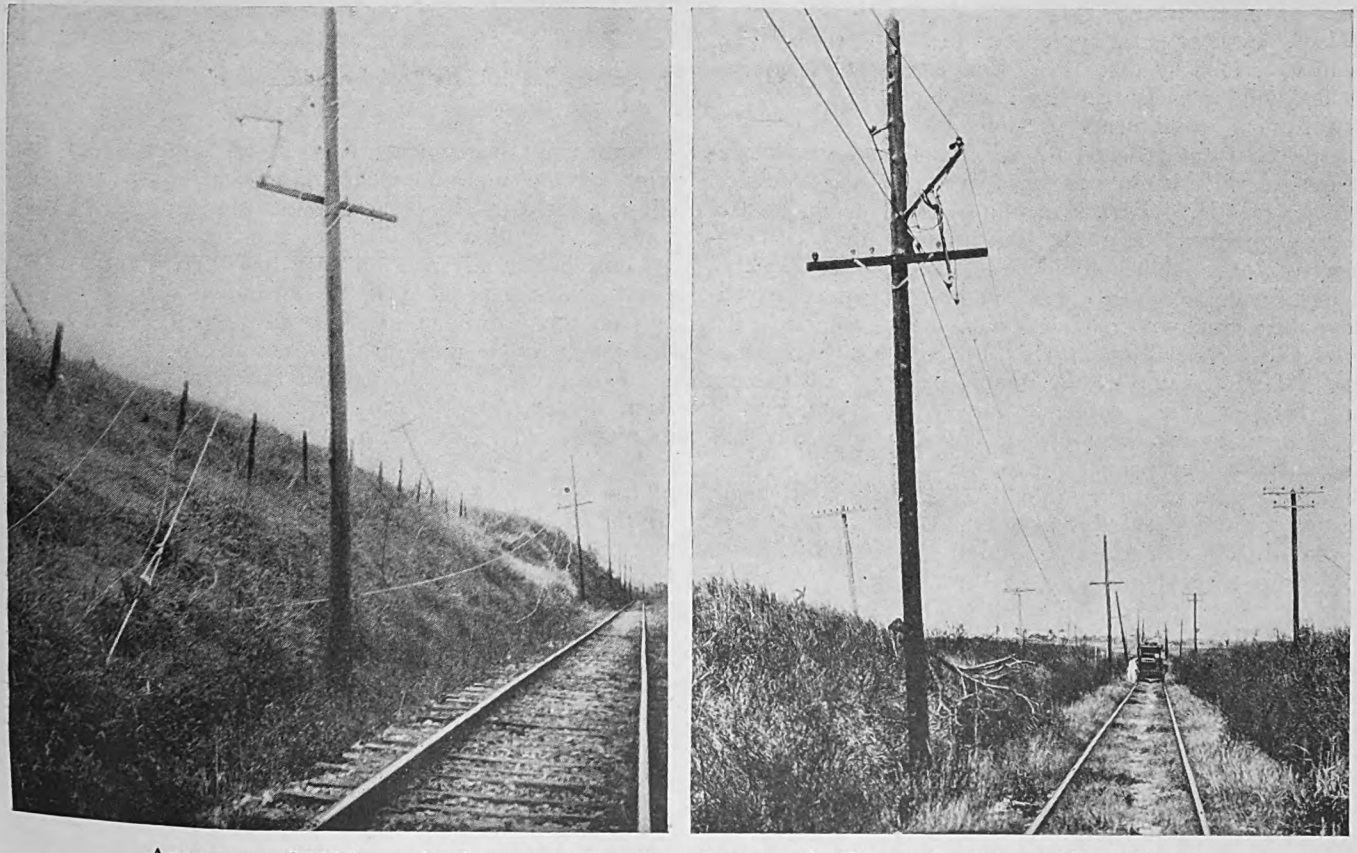
Sections of the electrified line showing the old direct-suspension system being replaced by catenary. In the center view is shown one of the steel bridges used for a portion of the line

house, located at Havana, at a trolley voltage of 600 d.c.

In the overhead construction, to reduce accident hazards, increase signal visibility and facilitate switching in the yard sections, long spans and considerable side clearances were necessary. In this case consideration of existing structures and poles was unnecessary. However, on the single-track main line divisions, where the wood poles were spaced 112 ft. with direct suspension, the problem of utilizing many of the existing poles was encountered.

The poles, due to proper maintenance, were found to be in good condition. Naturally, initial cost suggested the use of present pole locations, rather than entire relocation. But a pole spacing of 112 ft. is not inviting to the engineer wishing to show a low first cost on the installation. Neither is it attractive from the maintenance standpoint, because in a humid climate pole maintenance is greater than usual.

The result of a careful investigation of the yard work was the choice of a 300-ft. simple catenary span constructed with a $\frac{7}{16}$-in. Siemens-Martin messenger wire and a No. 0000 grooved contact wire giving a total weight per foot of 1.0 lb. Both the messenger wire and trolley



Appearance of 225-ft. wood pole catenary after the cyclone passed. The overhead was quickly realigned and operation resumed in record time

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wire were strung at a tension of 2,000 lb. at the normal temperature of 80 deg. F. The system was supported from latticed steel bridges which also carried pole extensions for a double-circuit three-phase, 33-kv. transmission line. The messenger wire was supported by 35-kv. pin type insulators mounted on the top chord of the truss. Owing to the slight curvature on this section the overhead was aligned with the track by attaching pull-over wires to intermediate Bates poles. Steady wires were placed at each structure.

On the single-track line it was found economical to continue the same tension and span design. The span length was decided by choosing every second pole location. This produced a 225-ft. spacing, which is 75 ft. greater than the usual spacing of wood poles on tangent track. However, with a temperature variation of only 25 deg. F. (70 deg. to 95 deg.) a favorable condition existed for this spacing, inasmuch as comparatively slight variations in mechanical loadings were encountered. Another favorable factor in the selection of the longer pole spacing was the soil encountered. Immediately around Havana there is to be found a fiery red soil, indicating a high iron content. It is not a clay soil, but is composed chiefly of decomposed limestone, sandstone and gypsum and is exceedingly good for pole foundations. Further, a single-circuit, 33-kv. line placed on top of the poles in several locations served to strengthen the line longitudinally. Poles were mostly of creosoted Southern yellow pine imported from the States.

On Oct. 20, 1926, Havana and the surrounding territory were badly damaged by a cyclone which, from the standpoint of wind velocity and loss of life, greatly surpassed the Miami disaster and preceded the Cuban cyclone by only three weeks.

The wind velocity registered on the government instruments previous to their destruction reached 100 m.p.h. Thousands of telephone, power and railway poles were leveled. The steel bridges on the four-track section of the Havana Central were supporting only the transmission lines. Consequently, little damage could be expected, and the actual damage was negligible. The single-track direct-suspension lines employing 112-ft. pole spacing approached a total loss. Poles were leveled, bracket arms torn loose and the relationship of the double trolley wires to ears and hangers was completely lost. The rebuilding of these sections was accomplished only by completely cutting away trolley wires from poles.

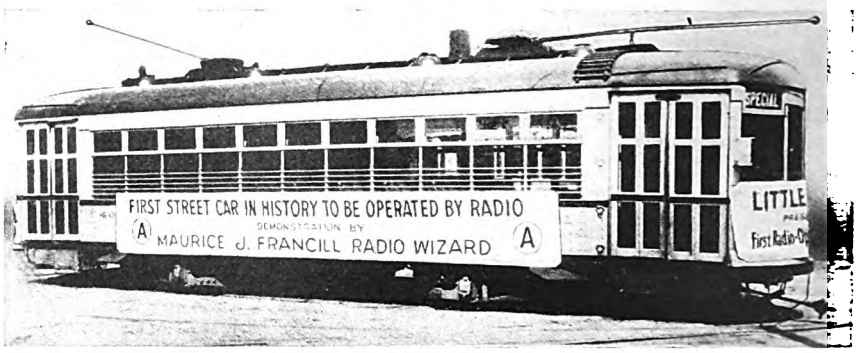
On the new catenary system, particularly the Rincón section, where poles were spaced 225 ft., the damage appeared to be as great as on the direct-suspension lines. However, after eliminating a few leaning poles, this damage was found to be small. The spans remained intact and the lines were quickly cleared and restored to an operating condition by realignment of poles and bracket arms. Very little time was lost through catenary maintenance, and it can be said the electrical department found it necessary to charge only a small per cent of its $236,000 cyclone figure to this account. The repair work, as well as the original building of these new systems, was accomplished by G. B. Fielding, signal engineer, under the direct supervision of J. A. Thomson, chief electrical engineer.

Trolley Car Operated by Radio

Little Rock Coffin Brief gives details of the demonstration that was conducted in that city

EARLY in 1927 the Arkansas Power & Light Company, which operates the street railway system in Little Rock, Ark., gave a demonstration that an electric car can be run through city streets safely without any one at the controller. The explanation perhaps should be made here that the company has no intention of trying to run its cars without operators. It was simply a matter of scientific interest and incidentally was a good advertising feat because thousands witnessed the trial, considerable space was given to it in the local press and a news reel was made by a moving picture company. The company's brief for the 1927 Coffin Prize contest gives particulars of the wireless system used.

To avoid any possible embarrassment through the failure of the remote radio control, a private demonstration was first given at the carhouse by the radio expert, Maurice J. Francill, who had charge of the trial. His success in controlling the movement of the car with a delicate 5-lb. instrument removed all doubt from the mind of the superintendent of transportation and his consent for a public demonstration was secured. Plans were soon made and a demonstration was arranged.



Operating a car in Little Rock by radio control

Considerable advance publicity had been given to the event, which took place in the downtown section of the city on the afternoon of Thursday, April 7, 1927, so that many people were on the sidewalks to see the trial.

At the proper time the demonstration car was brought from the carhouse to the downtown starting point on its own power. The radio expert followed in an automobile. After the brief ceremony of loading the Mayor of the city and a group of other distinguished citizens on the car the regular operator stood back and permitted the radio man in an automobile to start the car. He got off with a good start, running the car on two notches. At the street intersections the radio-governed street car complied with the traffic signals. It continued its run for about fifteen blocks.

As a natural precaution against possible accidents, the operator remained on the car in a convenient position so that he could take charge of it in the event of an emergency, but no such occasion arose.

The experiment has not been repeated, but the Little Rock company believes that it is the first electric railway company to have one of its regular cars driven through street traffic by radio control.

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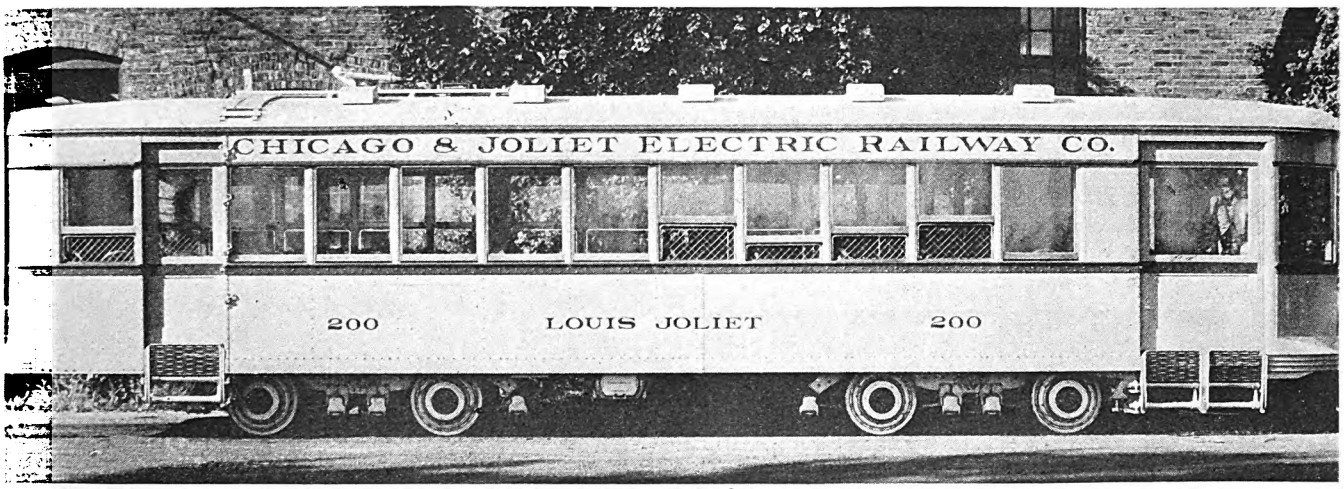
Light Weight
Features Joliet Car

By J. R. Blackhall
General Manager Chicago, North Shore & Milwaukee Railroad
Formerly Vice-President and General Manager Chicago & Joliet Electric Railway



The front door opening is wide enough to afford both entrance and exit facilities. The rear door has treadle control

Use of aluminum in car body brings weight per seat to 475 lb. High acceleration and braking rates combined with slightly increased free running speed have reduced schedule time

EXPERIENCE in the use of lighter weight cars in city operation in Joliet, with the resultant savings in capital investment and labor costs and the possibility of maintaining faster operating schedules, seemed to point the way toward the attainment of similar results in interurban service. Accordingly ten cars for our interurban service were purchased to replace the heavier equipment then in operation. These cars were built according to the railway's design and specifications and included some features new to cars of this class. They are of two distinct types, although all are designed for one-man operation. Six are of the one-end type for through interurban service and four are of the double-end type for local interurban service. The cars were delivered and put in service in September, 1926.

The outward appearance of the ten new cars was carefully worked out with the idea of appealing to the riding public, which has been educated by the motor coach lines to expect parlor car appearance and equipment. Streamline effects and attractive color combinations helped in this matter. Concealment of interior equipment, such as switches and air piping, in mahogany finished cabinets added greatly to the attractiveness, and a final touch was obtained by the use of bucket type, semi-individual passenger seats of leather and plush. Interior lighting was of the semi-indirect type, eliminating all glare. Sliding doors replaced the conventional folding ones, adding not only to the general appearance but eliminating a good deal of noise and also reducing maintenance cost.

The new cars weigh 39,000 lb. each, as against approximately 62,000 lb. for the type of car they replaced. They have four 35-hp. motors, where the older cars required four 100-hp. motors.

Whereas the older type cars could not maintain schedules, due to the increasing number of stops per mile, the new light-weight cars have reduced the time between Chicago and Joliet by ten minutes with but slightly higher free running speed. Quicker acceleration and quicker braking are responsible. The public has been quick to appreciate the improved service thus offered as well as the increased riding comfort of the new type cars. An increase in traffic has resulted.

When the new cars were purchased it was estimated that a return of about $40,000 per year would be realized on the investment of $168,000 as a result of operating economies and because of increased patronage. The reduction expected in operating expense was figured at $30,000 and the increased revenue at $10,000.

New wage rates for operators put in effect in January, 1927, tend to reduce the saving, but a study of operating

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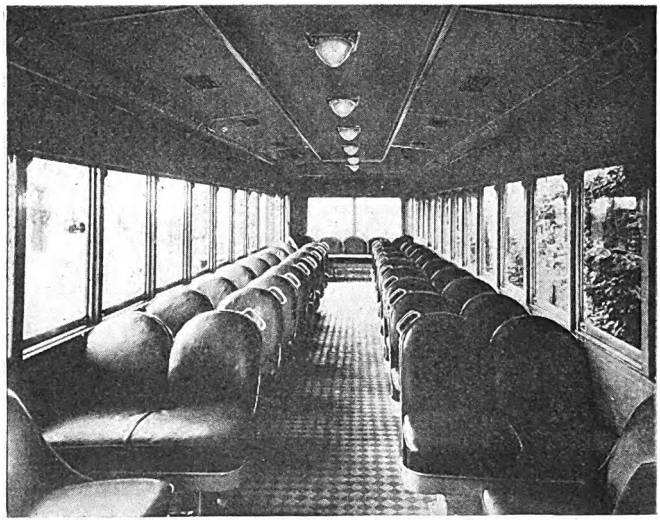
costs shows a reduction of $17,320 for eleven months in spite of the increased wages, and the gross earnings over the same period show an increase of $18,966. From this it would appear that the original estimate will not be far wrong in spite of the increase in labor costs. The one-man operation has resulted in a labor cost reduction of 2.46 cents per car-mile in an eleven-month period, a saving of 35.9 per cent after allowing for the increased rate of wages.

The average energy saving has been 20.3 per cent, due to the lighter weight of the cars. The average energy consumption per mile of the old type car was 2.76 kw.-hr., against 2.20 kw.-hr. for the new type.

Reductions in Maintenance Cost

After operating the cars for nearly a year it has been determined that there is a saving also in the maintenance of track, roadbed and equipment. There are no figures to show just what this saving is, but it is considered reasonable to place it at a minimum of 1 cent per mile. On the basis of the year's mileage this means an additional saving of more than $10,000. The actual saving in maintenance is not as yet available, but it is believed that it will be similar to that of other companies operating this type



Floor and ceiling of car have been designed for beauty as well as wear

of equipment and that it will run close to 30 per cent. The net increase on the three items mentioned totals about $50,000 per year, which is a return of practically 30 per cent on the investment in the lighter equipment.

It is of interest that while the gross earnings of the interurban line were being increased to the extent of 6.06 per cent the Joliet city line suffered a loss of 1.22 per cent in earnings in the same period due to a decrease in operating revenue of $4,072.

With all these facts in mind it was felt that if such results could be obtained with a light type of steel car we might, by use of a lighter metal, obtain additional economies as to operating costs, and, as far as possible, additional revenue from traffic increase due to greater riding comfort and better service. We proceeded accordingly, during the past year, with two innovations from which we confidently expect further economies, based on our past experience. First is a new type of truck, using an automotive type axle with roller bearings, a differential and a worm drive. The second is an aluminum car body of our own design to be used with this type of truck. We expect also to use aluminum in truck construction, but this is to be worked out a little later.

The aluminum car body was shown at the electric railway convention in Cleveland. The new type trucks have been in operation on one car of the ordinary type since May 19 and the results have exceeded our expectations.

Features of the New Car

Briefly, the features introduced in this new design of a one-man, single-end car are: (1) Automotive type axle with differentials; (2) roller bearings and worm drive; (3) fixed truck bolster; (4) aluminum car body; (5) automatic heating through dynamic conversion of the wasted kinetic energy of car braking to heat energy within the car; (6) utilization of the heat energy of the starting resistor for car heating. These all make for more economical operation and more comfort. This particular car was designed for city service in Joliet, but there is no reason why it could not be used for interurban service if the speed ratios were stepped up and several other minor changes were worked into the design.

The semi-floating type of axle has its bearings located directly over the tread of the wheels. The axle housing completely incloses these bearings. The use of differentials eliminates slippage of wheels on curves and the worm drive permits use of a motor of high speed with a single gear reduction, thereby affording a large reduction in weight as compared with a standard railway motor of equal power rating. This weight reduction is strikingly borne out by consideration of the following figures:

Type Truck	Motor Rating, Horsepower	Motor Weight, Pounds
Automotive	28	410
Former (common type)	25	1,000 with gears, approx.
Former (used on light-type steel cars)	35	1,500 with gears, approx.

Two motors are carried on each of the two trucks. They are connected by means of a driveshaft and two universal joints through the worm drive to the axle with an $8\frac{1}{2}:1$ ratio. Instead of the customary floating type, a fixed bolster is attached rigidly to the side frame. It depends for flexure entirely on the long, semi-elliptic springs, underslung from the axles and attached to the truck side frame by shock-insulating rubber blocks.

The trucks are attached to the car body by an interlocking center bearing without a kingpin. A rubber pad is inserted between the center bearing and the body bolster. Rubber pads are also used between the side bearing plates on the car and the truck frame. These rubber pads, together with the rubber spring supports, all tend to absorb vibration and prevent its being conveyed to the car body. The 26-in. wheels are of rolled steel, held on tapered axles by a large nut and key. A rubber cushion between the tires and hubs of these wheels is designed further to eliminate noise.

The drum brakes, of the air-operated, internal-expansion type, have a diameter of $17\frac{1}{4}$ in. They are mounted inside the wheels and are operated by a diaphragm on each axle housing. Each brake has four shoes of a special composition used on this type of equipment for the first time. Air is conducted to the diaphragms by $\frac{3}{8}$-in. tubing with flexible connections between tubing on the car body and that on the trucks. Use of this type eliminates all brake levers, links and toggles. The special composition used eliminates the familiar squealing of brakes. Experience to date shows a much longer life for

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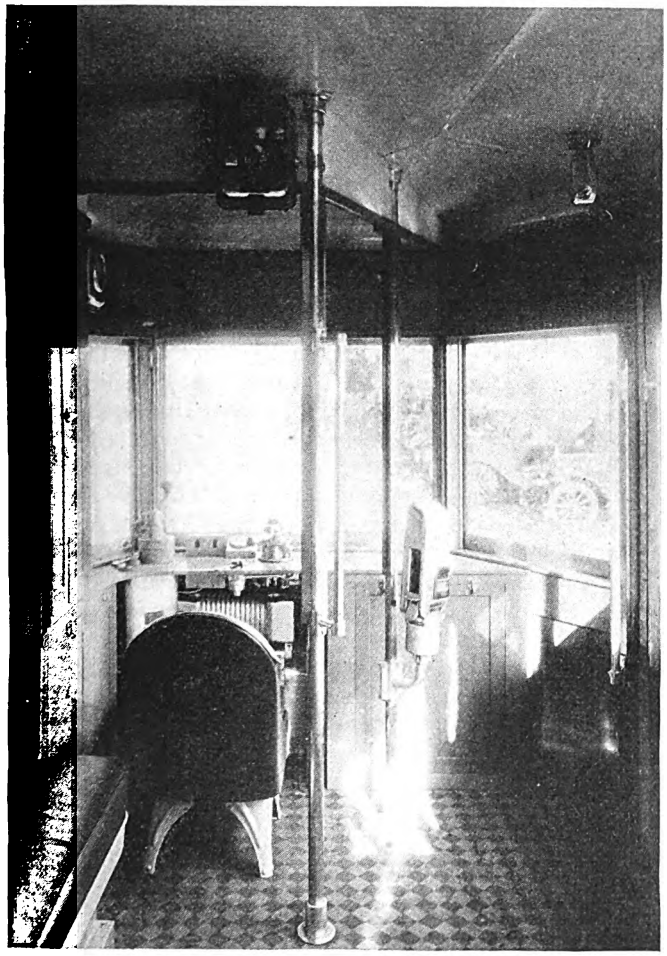
the new type of brakeshoe. The old type was good for 5,000 miles and needed many adjustments during that time. The new ones on the trucks in use have been run 10,000 miles with no adjustments and the indication is that their life will be from 30,000 to 40,000 miles.

Complete support of the motors on the truck frame, which is in turn supported on the long semi-elliptical springs, is expected to result in a material reduction in motor maintenance cost. The construction used has practically eliminated all the inherent noises of street car trucks and brake rigging. The new rubber-cushioned wheels have eliminated the ringing noise of the wheels on the rails and have made the car as void of noise as a modern automobile operating on good pavement.

What is believed to be an innovation in heating systems is the conversion of kinetic energy from braking the car into heat energy, together with energy loss from the starting resistors. There will be a supplementary set of

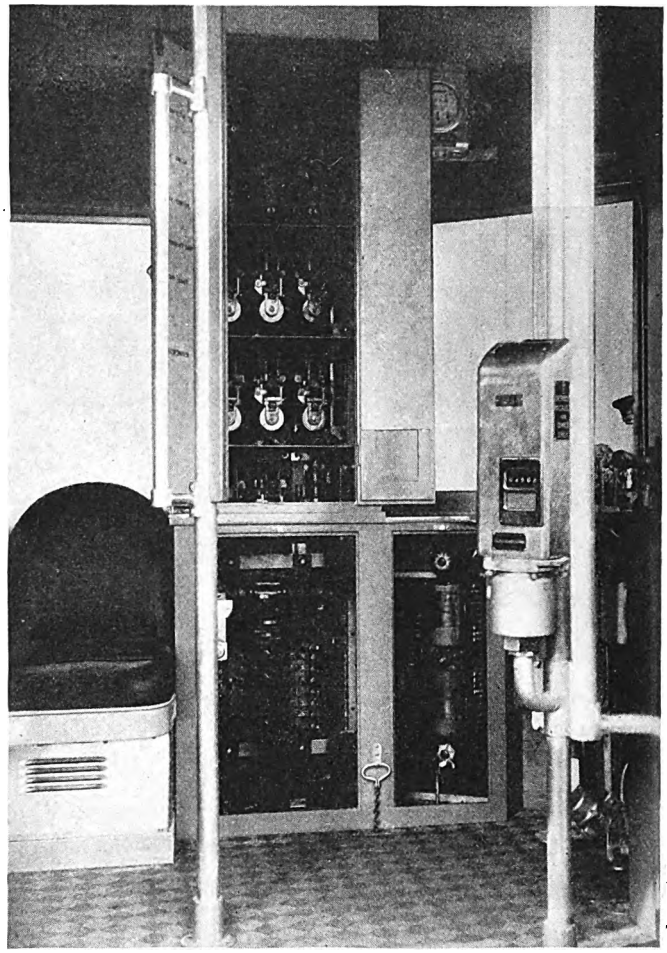


Control equipment is all located in the front vestibule

ten 500-watt heaters of the ordinary type as a reserve system.

No failure has been experienced to date with the light-type truck. The gears, axles and bearings were examined thoroughly at the end of 6,000 miles, but no perceptible wear was found. The manufacturer, basing his statement on these facts, estimates that the life of these parts may well be 1,000,000 miles.

Power tests on this type of truck in comparison with one of the old type, both used with the 22,000-lb. city-type bodies, show that the coasting qualities are 10½ per cent better. Accelerating characteristics are 25 per cent better with a total motor capacity of 112 hp. than for a car with the old trucks having a total motor capacity of 120 hp. The maximum service braking rate is 11 per cent higher. The free running speed is 12 per cent higher. With the new aluminum car body we expect that this increase will range from 30 to 40 per cent higher than with ordinary trucks and bodies. We likewise expect



Cabinets for equipment parts give neat appearance

the acceleration and braking rates to be increased, as the new body will weigh 10,600 lb. as against the present body weight of 22,000 lb. Until tests can be run no energy savings can be determined accurately, but we believe we are conservative in expecting at least a 20 per cent saving in this item.

The Body Is Made of Aluminum

The new aluminum body is of the single-end type with a front door opening wide enough for both entrance and exit. There is a treadle-operated rear door for exit only. The step-well was eliminated, without increasing step height, by use of double folding steps at both ends, giving steps of 10¾ in. and 11⅞ in., respectively. The control equipment is all located in the front vestibule in the least fatiguing position for the operator.

Both ceiling and floor of the car have been designed for beauty and wear as well as for comfort. The vestibule ceiling is of sheet aluminum and the interior below the window sill is lined with heat-treated notched sheet aluminum. In the body itself aluminum alloy castings are used for condulets, drawbar anchorages, heater casings and door engines. Aluminum alloy plate, sheet pressings

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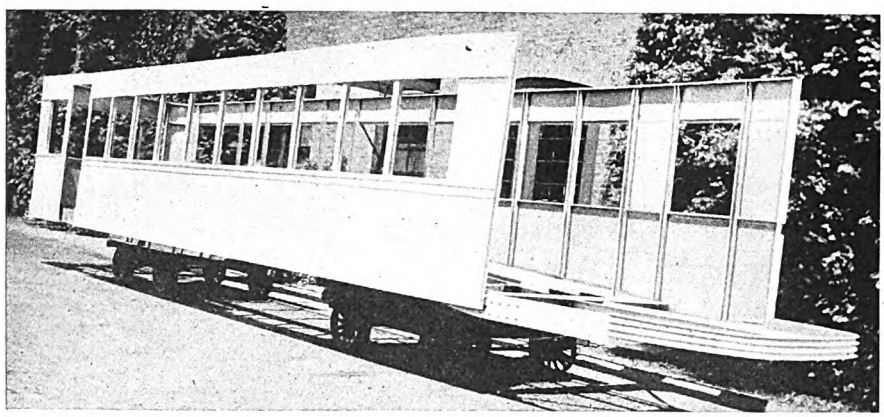
and structural shapes are used in the construction of cable boxes, lighting fixtures, drawbars, ventilators, trolley base, trolley pole and harp, headlining, trolley retriever, window guards, destination signs, underframe bolster, anti-climber bumpers, step-treads and doors. Wherever strength is required the aluminum is heat-treated, giving it the same properties as structural steel. The only structural steel used is on the two outside platform sills at the entrance and exit doors, to which the step supports are fastened. There was no standard aluminum section heavy enough for these parts, so steel was used to save making special pieces. Aside from this the body frame is aluminum throughout. Seat frames and pedestals are also of aluminum and are of special design.



Except for two outside platform sills, car body frame is of aluminum

Genuine green leather upholstery is used. The seating capacity is 50.

Some of the principal car weights are as follows:

	Pounds
Weight of body complete with seats and accessories	10,410
Weight of trucks without motors	9,012
Weight of electrical equipment, including motors and heaters	3,600
Weight of air braking equipment and piping	700
Total	23,722

The weight per seated passenger is 474.4 lb., as against approximately 900 lb. with the present type car. An idea of the savings in weight over corresponding steel parts can be had from the following:

	Reduced From, Lb.	To, Lb.	Reduction, Lb.	Per Cent
Frame	7,000	2,600	4,500	63
Miscellaneous parts	....	....	2,000	..
Body	22,000	10,410	11,590	53
Air brake system	2,000	700	1,300	65

We found the cost of the aluminum car high due to the fact that most of the castings and specialties had to be made up for this job alone, entailing also additional pattern costs in some cases. An instance of this is a coupler casting which cost $59 in addition to a pattern cost of $60. Another is the price paid for special machine bolts. In steel the ⅜-in. x 2-in. size costs about 1 cent each; in aluminum these cost $2 each. Material for steel fenders made up in our own shop costs about $5, as against $35 for aluminum. These costs will hardly be overcome by savings in operating expense resulting from the use of aluminum parts, but the savings will, of necessity, remain in doubt until operating experience has indicated the amount by which repairs are reduced through the use of the aluminum parts. It should be borne in mind, however, that prices for aluminum castings and other specialties will be decreased materially when aluminum cars are built on a production basis.

Economies Justify Costs

The additional cost of the frame is amply justified by the operating economies effected. The 2,600-lb. aluminum frame cost $1,600, as against about $300 for a 7,100-lb. steel frame. This represents a saving in weight of 4,500 lb. We figure that our haulage cost covering power, maintenance, etc., amounts to 5 cents per pound per year. A saving of $225 is thus made each year on this item alone, enough to pay the additional cost of aluminum in about six years. Thus the additional cost for aluminum is amply justified.

Other advantages of aluminum are that it has less tendency than steel to rust and corrode and that wrecked or obsolete equipment will have greater salvage value as compared with steel. Lighter equipment, of course, needs a better conditioned roadbed to have riding qualities equal to those of heavy equipment. We feel that our experience justifies us in stating that, having put our roadbed in condition to handle the lighter cars satisfactorily, our maintenance costs will be less now than formerly, due to decreased wear. This will, we believe, more than offset the cost of putting the roadbed in the required condition. The advent of the one-man type of car also brings with it increased safety, due to control being centered in one man instead of being divided between an operator and a conductor.

We cannot as yet show any definite results, but we believe that we will have valuable experience with our new type trucks after they have traveled 100,000 miles and with our new aluminum car after it has passed through a period of active service. We feel that we are on the right course and that our hopes will be fulfilled. Light-weight equipment has shown itself successful in improving interurban line service and increasing profits from it. There is no reason to believe that the aluminum equipment will not go further in this respect.

We will do no further experimental work this year, but if the car proves the success we think it will be it is probable that we will build more like it.

New Jersey Stockholders on the Increase

DURING the six months ended June 30, 1927, a total of 10,570 new names was added to the stockholders' list of the Public Service Corporation of New Jersey. As a result of this gain the company had on its books June 30, 1927, 62,572 names covering all classes of stockholders, eliminating duplications where holders own either common and preferred or more than one class of preferred stock. The total of 62,572 individual stockholders reported on June 30 compared with total stockholders numbering 52,002 reported on Dec. 31, 1926.

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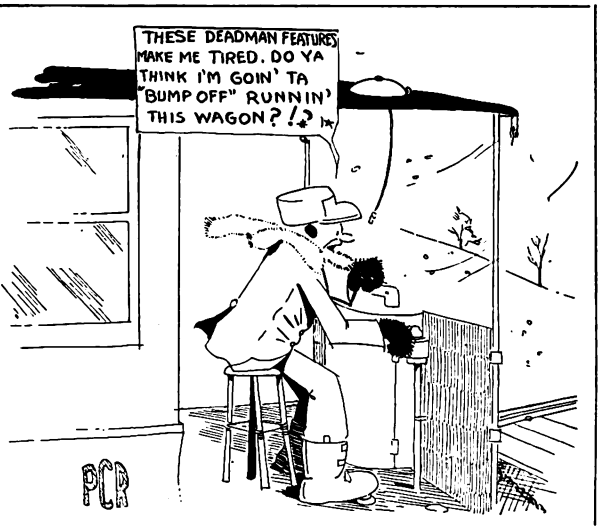
Adventures of

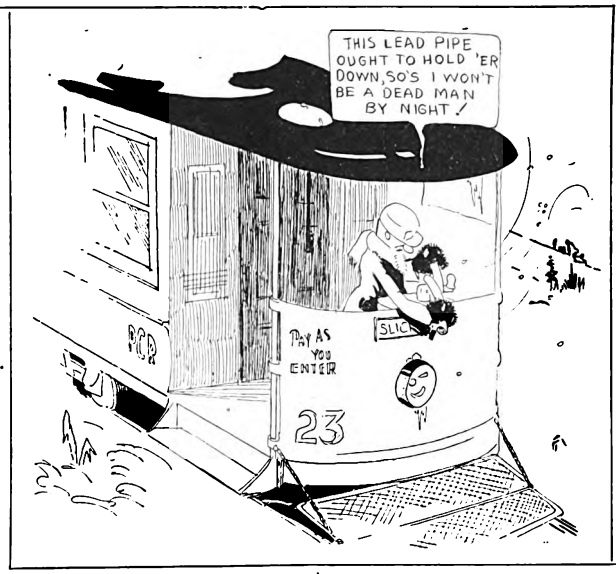
Old Man Trouble

on the

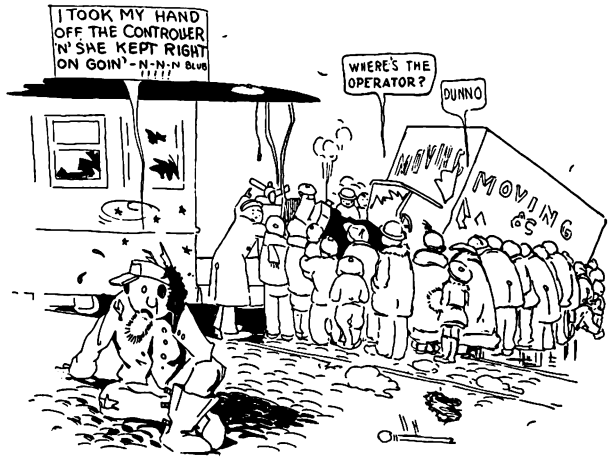
Hicksville Railway



Cars may be protected against dead motormen, but one has to go some to protect them against fools



Safety equipment on cars will shut off the power, apply the brakes and sand the track quicker than the human mind can direct any one of these acts in an emergency. Don't tamper with them! Weights, wedges or fancy contrivances on the controller handle or the foot valve are always forgotten in time of emergency.



ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes of this series at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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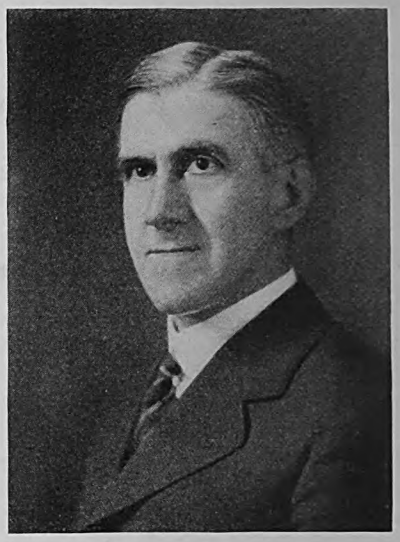
Harold E. Bean

Wins the November Monthly Maintenance Prize

Means for straightening steel poles without removing them from the ground through the use of a simple fixture developed by the New York State Railways was awarded the $25 monthly prize for November in Electric Railway Journal's *maintenance competition. A method of making up special work frogs for quick repairs received honorable mention. This was submitted by Louis T. Botto, superintendent of maintenance of way San Antonio Public Service Company, San Antonio, Tex.*



Harold E. Bean

TUBULAR steel trolley poles frequently are pulled out of alignment by loading or by the tension of trolley supporting span wires. Poles out of plumb present an unsightly appearance and also may pull the trolley wire itself out of alignment so that additional maintenance work is required at frequent intervals. To straighten the poles so as to keep up the appearance of the line, the New York State Railways uses a special fixture that provides a simple and cheap method for straightening a tubular steel pole. It can be used on any property without the necessity of removing the poles from the ground. A description of the fixture and its use was given in the Nov. 19 issue of Electric Railway Journal. It was submitted in the contest by Harold E. Bean, chief engineer of way and structures for the Syracuse lines of the New York State Railways.

A method of making up special work frogs for quick repairs submitted by Louis T. Botto, superintendent of maintenance of way San Antonio Public Service Company, San Antonio, Tex., was awarded honorable mention by the contest judges. This method of making up frogs for emergency replacement is quite ingenious. For a given blank center casting the range in frog angle is large and the cost of making such a frog should not be excessive. Frogs constructed as outlined in this article should have a life considerably in excess of that of an ordinary jump frog and should be much more satisfactory. Adequate strength is obtained through the use of acetylene welding.

The items selected for the November monthly prize and for honorable mention were two of the group of twelve published in the Nov. 19 issue. Items for the contest continue to come in and additional items appear in the following pages. One of these will be awarded the $25 monthly prize for December. Results of the contest each month are published in the issue of Electric Railway Journal devoted to maintenance and construction, which is the third issue each month.

The following gives a summary of conditions for submitting material in the contest. Complete details were published in Electric Railway Journal for April 16, pages 700-701.

1. Any employee of an electric railway or bus subsidiary may compete.

2. The author does not need to be the originator of the idea.

3. Articles may be submitted by several persons or by a department.

4. Any maintenance practice or device for electric railway or bus repairs may be the subject.

5. Articles should be 100 to 200 words long with one illustration, and in no event longer than 400 words with two illustrations.

6. Illustration material may be in the form of drawings, sketches, blueprints or photographs. All sheets should be marked "Maintenance Competition."

7. Manuscripts should be mailed to the editor of Electric Railway Journal, Tenth Avenue at 36th Street, New York.

8. A prize of $25 will be awarded each month for the best maintenance idea in the group published. A minimum of $5 will be paid for each article accepted for publication. Manuscripts will be received until April 30, 1928.

9. Announcement of the winner each month will be made in the issue devoted to maintenance and construction (the third issue each month) following the one containing the item.

10. Additional details were given in Electric Railway Journal for April 16, pages 700-701.

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who was awarded the monthly prize for November in Electric Railway Journal's Maintenance Contest, is chief engineer of way and structures for the Syracuse lines of the New York State Railways. He has held this position since 1920, and for two years previous to that was assistant engineer of way and structures for these lines. Mr. Bean's electric railway experience began with the New York State Railways in Rochester in 1912 as mechanical draftsman. Two years later, after having served as building inspector on new construction, he was appointed superintendent in charge of underground circuits, and also had supervision of parks, return circuits and inside wiring. In 1917 he was made superintendent of distribution of the Rochester City lines of the company.

In his present position Mr. Bean has jurisdiction over all construction and maintenance of track, transmission lines, substations, d.c. distribution and buildings for the Syracuse lines of the New York State Railways. He has been very active in committee work of the American Electric Railway Engineering Association for several years, and has been a pioneer in the development of welding for manganese track construction.

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Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—9

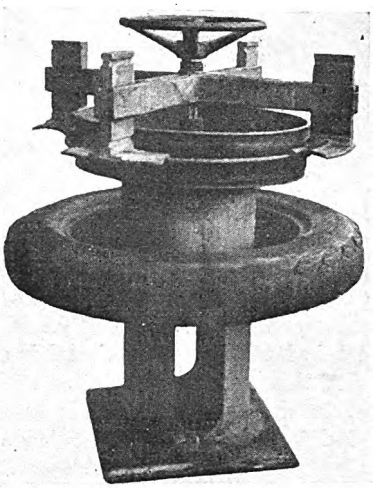
Machine Reduces Difficulty of Tire Changing*

By D. S. MacKay
Supervisor of Automotive Equipment Boston Elevated Railway, Boston, Mass.

NEARLY all of the 235 buses operated by the Boston Elevated Railway are equipped with solid disk wheels. Tire changing in connection with them is quite expensive. To decrease the labor required, the foreman of one of the bus garages devised the machine shown in the accompanying illustration.

A rugged, heavy, portable stand was constructed with a coarse threaded stud projecting upward. A spider with four radial arms slips onto this stud and a pressure shoe, arranged to engage the tires with lock rings, slides back and forth on each radial arm so as to accommodate any diameter of wheel. A threaded pressure wheel screws on to the stud above the spider so as to enable one man to apply great pressure to the tire or lock rings.

Some of the desirable results accomplished by this machine are that only one man is required and great physical force is not necessary, so that the job is made more pleasant. It is unnecessary to lift a wheel or tire from the floor since the machine is built to tilt at an angle of 30 deg., allowing the wheel to be threaded on to the stud. An even, steady pressure is exerted on the tire all the way around and there is no possible chance of injury to either the tire or wheel. Five tires can be changed in the time originally taken for one by the old method where tires were removed with a heavy hand hammer and tire tools. The machine is also used for pressing on new tires as well as for removing old ones.



Tire-changing machine used in the garages of the Boston Elevated Railway

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

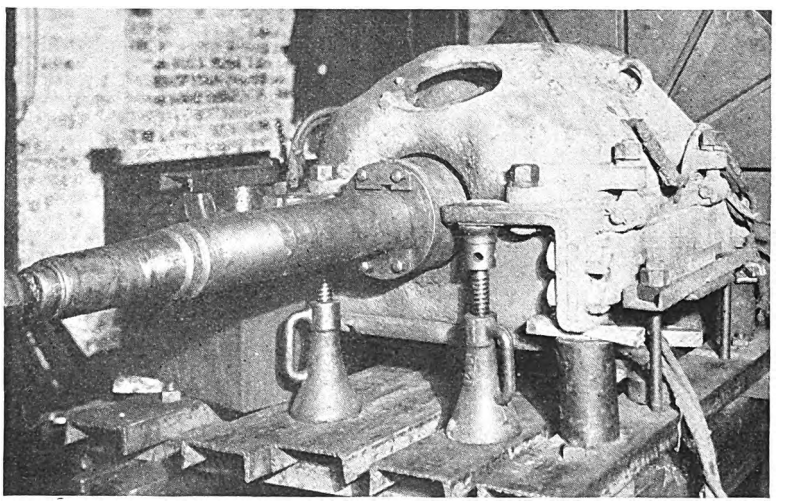
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—31

Boring Axle Bearing and Housing Seats in a Wheel Lathe*

By Frank B. Carpenter
Master Mechanic Charleston Interurban Railroad, Charleston, W. Va.

WHEN the bearing fits in the motor frames and housings for armature and axle bearings become worn, it is the practice of the Charleston Interurban Railroad, Charleston, W. Va., to build the fits by welding and bore these out to the original size. This work is done on a wheel lathe by using a few 6-in. channel iron plates and four 8-in. screw jacks to attach and hold the motor shell in position. The boring bar and cutter head are made from an old car axle and a hub of a worn steel wheel.



Set-up for boring out armature bearings in wheel lathe

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

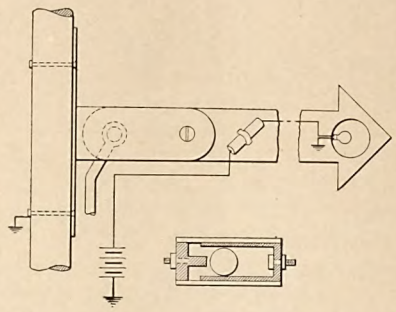
BUSES AND TRUCKS—10

Gravity Switch for Bus-Turn Signal*

By Farrell Tipton
Electrician San Diego Electric Railway, San Diego, Cal.

DUE to the construction of some of the modern passenger buses, it is impossible for the driver to give signals by hand. This makes a mechanical turn signal necessary. The accompanying illustration shows the arrangement used by the San Diego Electric Railway. The signal is controlled through a crank located adjacent to the operator. This is connected to a lever on the outside of the bus which controls the operation of the arm.

The signal arm is made of sheet metal, painted white. A lamp is located at the end of the arm and is inclosed by a red lens at the rear and a green lens at the front. This makes the position of the arm visible at night.



Gravity switch used to control lamps on bus-turn signal

To control the lamp a gravity switch has been devised to open and close the circuit by the action of the signal arm. The switch is made of fiber tube outside with a copper tube inside. Both ends of the switch are sealed. The cap on one end of the tube has a contact post projecting into the center of the sleeve. Electrical connection is made by a ball which is free to roll from one end of the tube to the other. Both ends of the switch are provided with terminals.

When the switch is installed on the signal arm, the switch is inclined at an angle so that with the arm extended the ball rolls into a position completing the lamp circuit from the side of the sleeve to the center contact post. The switch is connected to the positive side of the bus battery, the other side of the lamp and battery being grounded to complete the circuit.

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

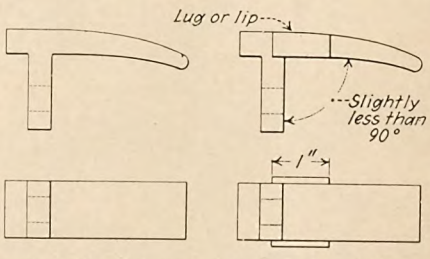
ROLLING STOCK—ELECTRICAL—32

Keeping Line Breaker Arcing Tips Tight*

By A. T. Olsen
Omaha & Council Bluffs Street Railway, Omaha, Neb.

TROUBLE was experienced from DB-987 line breaker arcing tips coming loose in service, which usually resulted in tying up the car. As originally constructed, each tip is held in place by only one cap screw. The tips have a very narrow seat and eventually are loosened by the hammer blows of circuit closing.

To improve this condition, the Omaha & Council Bluffs Street Railway, Omaha, Neb., uses an arcing tip which has a lug or lip on either side. When forced firmly against its seat the hammer blows of the circuit closing do not loosen the tip. Except for these added lips, the arcing tips are identical with the manufacturer's product.



At left, old type of tip. At right, arcing top with lug to prevent loosening

The lips are 1 in. long and are welded onto the manufacturer's tip and filed to fit the seat. In order to insure that the tips seat firmly the part through which the cap screw passes is bent to an angle slightly less than 90 deg. As the cap screw it tightened the tip comes to a firm seat.

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

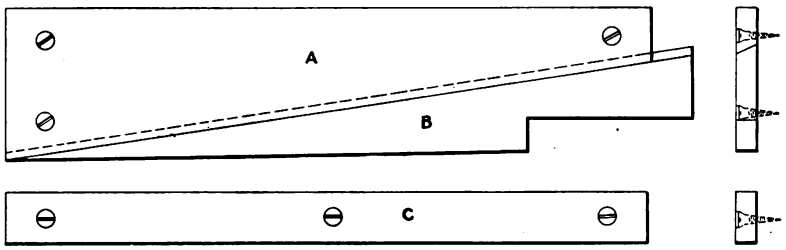
ROLLING STOCK—MACHINE SHOP—6

Convenient Type of Bench Clamp*

BY ARTHUR E. CLEGG
Foreman Electrical Department
San Diego Electric Railway, San Diego, Cal.

SAVING of time was the purpose that led to the design of a type of bench clamp used by the San Diego Electric Railway, which is shown in the accompanying illustration. Work can be held in the clamp firmly so that extreme accuracy will result and there is no wasting of time by the work slipping out of the clamp as in some other types.

The sections of the clamp designated as *A* and *C* are held on the end of the bench by means of wood screws. The movable part marked *B* slides along the beveled surface of *A*. The opposite side of *B* is parallel with the side of section *C*. The offset in *B* at the end provides for large objects. Very thin parts can be held by putting thin pieces along the surface of *C* and sliding the movable section *B* on the work, thus clamping it tightly.



Bench clamp as used in the shops of the San Diego Electric Railway

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

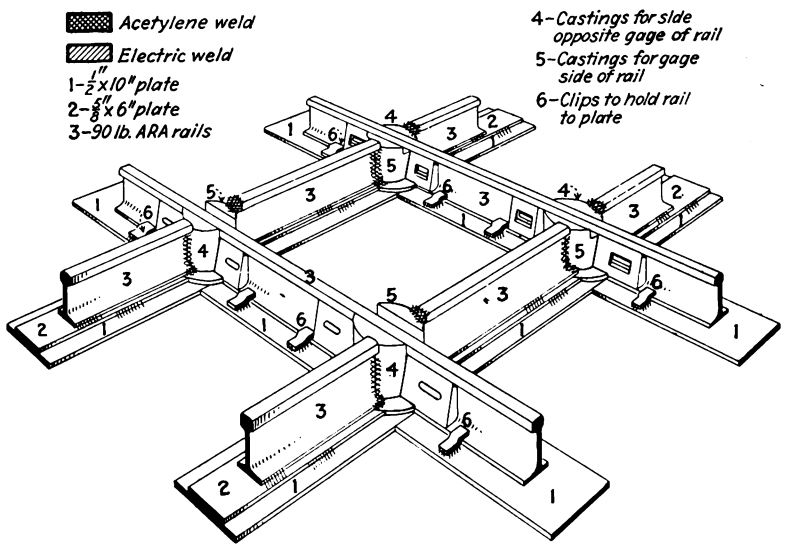
TRACK AND WAY DEPARTMENT—14

Flange Bearing Electric Over Steam Railway Crossing*

BY LOUIS T. BOTTO
Superintendent Maintenance of Way
San Antonio Public Service Company, San Antonio, Tex.

DURING the past year a special type of electric-steam railway crossing has been developed by the San Antonio Public Service Company. In this, the electric line is flange bearing over the steam line rails. This crossing is fabricated of 90-lb. A.R.A. rails, steel plates and two special steel castings which accommodate any angle between 50 and 90 deg. The framework holds the railroad rails securely to line and gage, but these castings are not bolted or fastened to the rails in any manner.

Since steel plates under the crossing are in the same plane, standard cross ties can be used at right angles to the railroad rails as in standard



*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MACHINE SHOP—7

Electro-Pneumatic Shear*

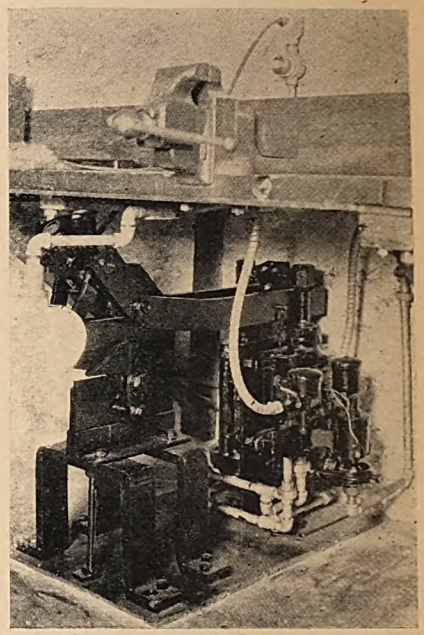
By A. D. Moore

Electrical Department, 69th Street Terminal
Philadelphia Rapid Transit Company,
Philadelphia, Pa.

MANUAL operation of a shear with a capacity of ½-in. x 2-in. flat and ¾-in. round stock has been obviated by changing it for use with an air compressor in the shops of the Philadelphia Rapid Transit Company. A pair of obsolete pneumatic switch movement cylinders were mounted vertically on a bedplate together with the shears. The piston rods are connected with a yoke and power is transmitted from the cylinders to the shear through a lever with a 5 to 1 ratio. The lever consists of two bars with a common fulcrum tied together with a shaft which works in a bushing welded through the body of the shear. The connection between the lever bars and the piston yoke is made by means of a link. The original pin fastening the shear links with the manual lever was replaced by a shaft carrying a roller at each end. The lever bars are slotted and bear on these rollers, thus transmitting power to the shear blade.

Air to the apparatus is controlled by an electro-magnetic signal magnet valve. Directional control is by an electrically controlled National Pneumatic door engine valve which admits air to either end of cylinders.

In operating the shear the circuit is closed to the electro-magnetic valve. With the initial movement of the shears a holding circuit makes it unnecessary to continue to press the starting button. A circuit controller connected by links to the lever reverses a directional valve when the stroke is completed and returns the blade to its normal position. Provision is made to return the blade to its original position at any part of the down stroke as a safety feature.



Electro-pneumatic shear as constructed in the shops of the Philadelphia Rapid Transit Company

As the shear was placed beneath a bench for space economy, a swivel lamp is mounted for illumination.

*Submitted in Electric Railway Journal Prize Contest.

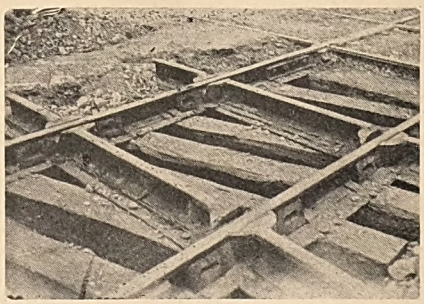
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—14

Flange Bearing Electric Over Steam Railway Crossing*—Continued

construction, and the steel plates provide better surface bearing on the ties. In paved street intersections where both steam roads and electric lines operate over double track, one set of crossings tends to creep in one direction and the other set in the opposite direction. This often causes a very unsightly and dangerous condition. With the type of crossing illustrated, such conditions do not occur.

In the construction of this crossing the arms of the electric part are perfectly flexible and form a kind of ball and socket joint with the railroad rails, which can be raised or lowered as conditions require. In paved city streets electric railways often are compelled to have crossings over the curves of steam roads, the outside rails of which are superelevated. Where such crossings occur the outside joints of the electric line usually cause an expensive maintenance job. With the type of crossing shown such conditions are accommodated very nicely.



Type of steam-electric crossing used by the San Antonio Public Service Company

During the past year nine of these crossings have been installed by the San Antonio Public Service Company. On an average they have cost much less than the crossings previously purchased and two welders with two helpers are able to fabricate a single crossing in three days.

*Submitted in Electric Railway Journal Prize Contest.

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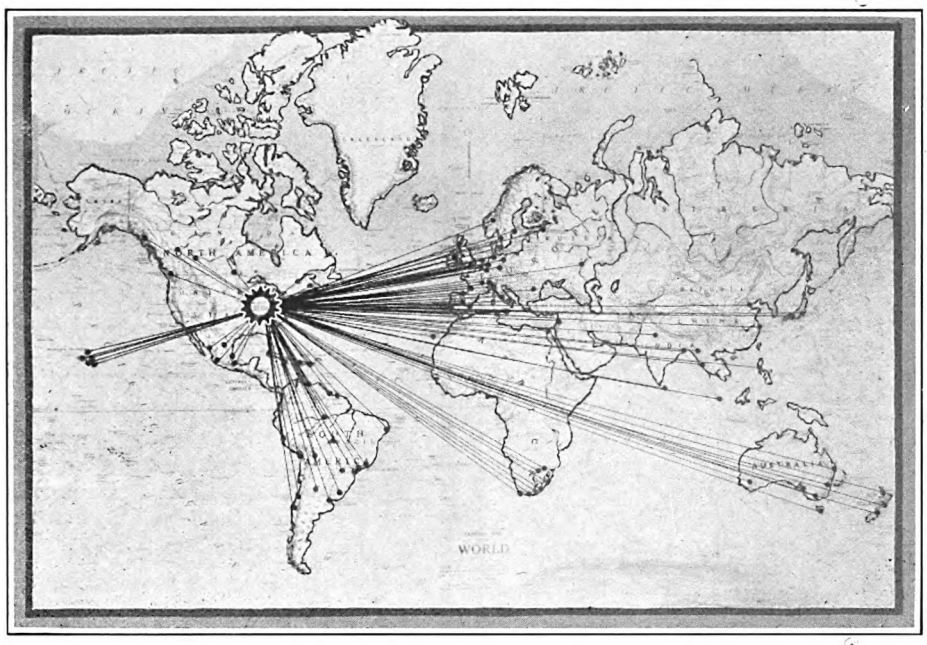

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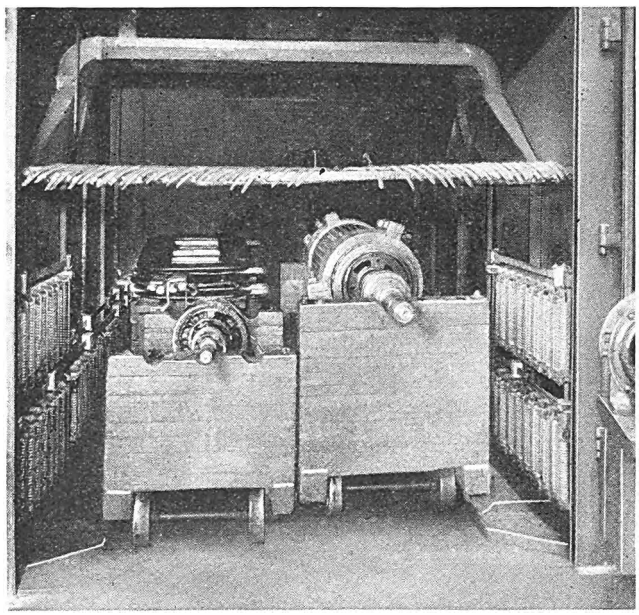

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Road failures to a considerable degree are motor insulation failures.

These failures are greatly reduced by periodic renewals of the insulating varnish, which protects the car motor armature.

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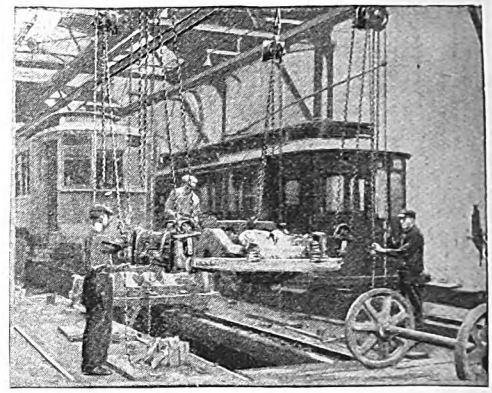

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Electric Railway Journal Maintenance Data Sheet

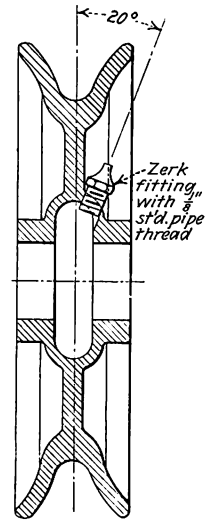
ROLLING STOCK—MISCELLANEOUS—18

Grease Fittings Applied to Trolley Wheels*

BY CHARLIE HERMS
General Foreman San Diego Electric Railway, San Diego, Cal.

TROLLEY wheels lubricated by Zerk grease fittings are used by the San Diego Electric Railway. Wheels are ordered with a hole drilled and tapped for ⅛-in. standard pipe at such an angle as to permit the use of a Zerk grease gun nozzle. For a 6-in. diameter wheel an angle of 20 deg. is required to permit the placing of the gun nozzle between the harp and the flange of the wheel.

This method of lubrication shows that there is less bushing and pin renewals and less time is required on inspection for lubrication of trolley wheels than with methods previously used. The life of the trolley wheel itself is also increased as fewer wheels develop flat spots that are usually caused by sliding on account of poor lubrication. Zerk fittings are removed from old wheels and reinstalled in new ones.



Application of a Zerk fitting to 6-in. trolley wheel

With this method of lubrication the chamber of the trolley wheel is kept filled with grease and a wheel can make a 500-mile run without danger of running dry. Another advantage of the Zerk fitting over the old method is that grease or oil is not spattered over the ends of cars. Previously inspectors did not have a proper method of applying the lubricant and a considerable amount would be dropped on the cars and cause a bad appearance.

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

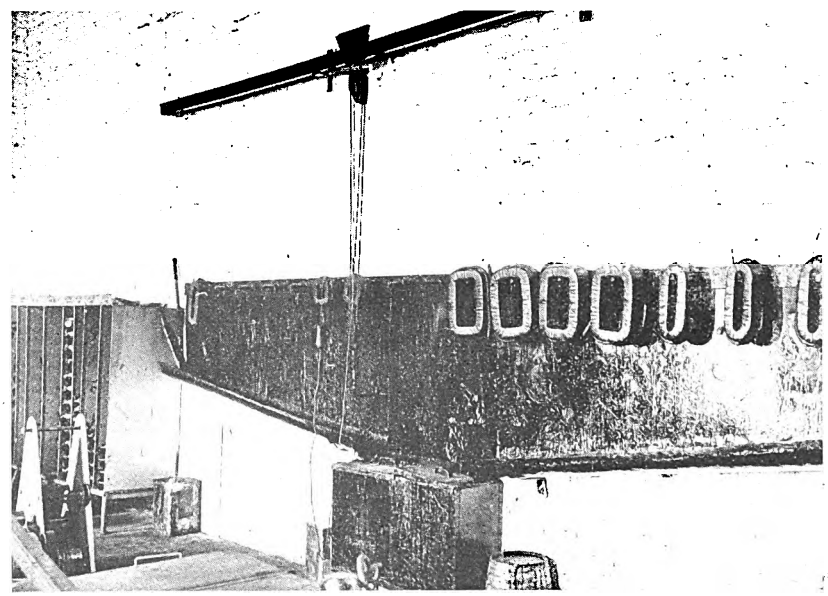
ROLLING STOCK—ELECTRICAL—33

Dipping and Draining System for Field Coils*

BY EQUIPMENT DEPARTMENT
Georgia Power Company

REINSULATION of field coils with the system used by the Georgia Power Company requires dipping in plastic varnish before and after the canvas webbing is put on and dipping in finishing varnish to provide a smooth, glossy finish after the last baking. Convenient equipment is provided for the dipping and baking in the form of a sheet metal trough 20 ft. long fastened to the shop wall. The trough is divided into two sections of equal length, each draining toward the center and emptying into different vats. One side is used for black plastic varnish and the other for air-drying finishing varnish. By dividing the trough the two operations can be taken care of without mixing the fluids.

Supports are provided for the field coils in the form of pegs welded



Dipping and draining board used by the Georgia Power Company in the Atlanta railway shop

*Submitted in ELECTRIC RAILWAY JOURNAL *Prize Contest.*

(OVER)

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Electric Railway Journal Maintenance Data Sheet

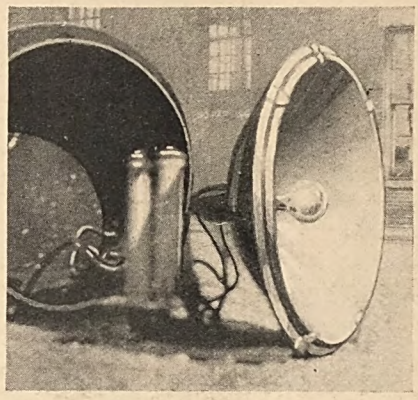
ROLLING STOCK—MISCELLANEOUS—19

Modernizing Headlights*

By R. T. Chiles
Master Mechanic Cumberland County Power & Light Company, Portland, Me.

IN ORDER to bring our headlight equipment to a higher degree of efficiency we were confronted with the alternative of junking 50 Imperial headlights and rewiring cars for use of a more modern type or the reconstructing of the present headlights. As the cost of new equipment and wiring changes would have been about $60 per car, it was decided to modernize the present headlights so as to use standard 150 or 95-watt concentrated filament lamps and a glass reflector with focusing arrangement.

This was accomplished without changes to the car wiring, as in addition to the 210 ohms in the old headlight resistance we added 295 ohms in the circuit. This provided 60 volts for the dim stage, and by tapping the resistance in the headlight circuit at the 160-ohm point 115 volts was provided for the bright stage. The two resistance tubes in the headlight are mounted on the original bracket and, for the 150-watt lamps, are wound with No. 24 resistance wire.



Construction used for modernizing headlights

For headlights using 94-watt lamps a resistance of 611 ohms was added in the headlight in addition to the old resistance for the dim stage to provide 60 volts and a tap was brought out to give 300 ohms and provide 115 volts for the bright stage. No. 29 resistance wire was used. Other material used to modernize the headlights included 12-in. glass reflectors, new sockets and a small amount of resistance wire. The labor cost was about $16 per headlight.

Submitted in Electric Railway Journal, Prize Contest

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—33

Dipping and Draining System for Field Coils*—Continued

into a piece of ⅜-in. x 3-in. steel which is fastened to the wall along the top edge of the back of the trough. The pegs are spaced 12 in. apart and with fields in position there is 1 in. clearance between them.

For convenient handling a small traveling hoist with a brake above the trough is arranged so that the lifting hook will remain in any position until the brake is released. One man can lift a field coil with the hoist and move it along the trough without danger of dropping it.

This system replaces one which required two men to handle coils from the dipping vat to the drain board. The old system required a floor space 8 ft. square. The new equipment is 20 ft. long, projects 18 in. from the wall and uses less than one-half the floor space of the previous equipment. It also presents a much neater appearance.

Submitted in Electric Railway Journal Prize Contest.

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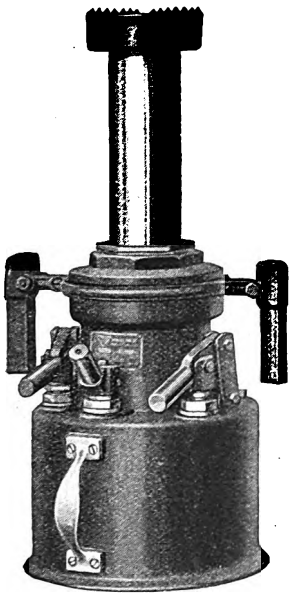
New Equipment Available

Light-Weight 75-Ton Jack

EXTENDING its line of oil power jacks, a 75-ton model hydraulic jack has been brought out by the Blackhawk Manufacturing Company, Milwaukee, Wis. This new model weighs but 200 lb. and is lighter than jacks of other design of similar capacity. It has special carrying handles so that two men can carry it with little effort.

The collapsed height of the new jack is but 18 in. and is low enough to go under most jobs. It has a 10-in. lift, which gives a total height of 28 in. There are two pumps, a speed pump to raise the plunger of the jack to the point of contact and a power pump to raise the load.



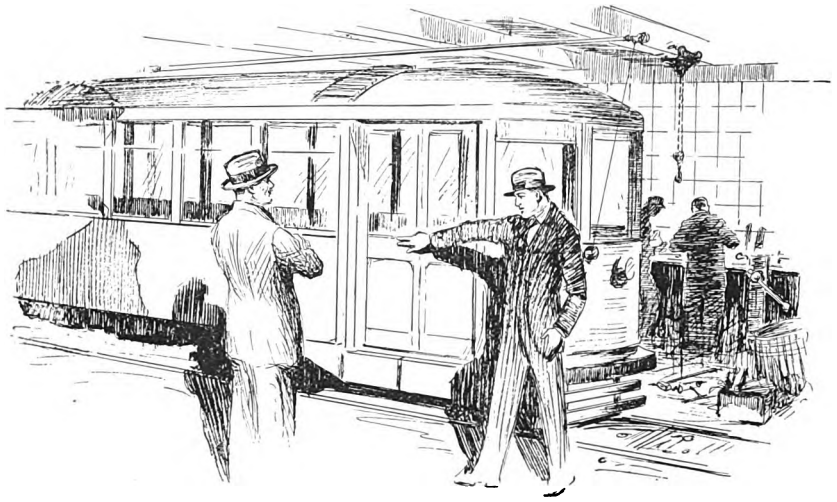
New 75-ton hydraulic jack

The load is lowered automatically, fast or slow as desired, and is under control at all times. It can be raised or lowered in fractions of an inch, as desired. A release valve entirely separate from the pump prevents accidental lowering. All working parts are built on the outside of the jack.

An outstanding feature is the check valve unit. This contains both ball checks and is the heart of the jack. The twin check unit can be removed easily for cleaning by simply unscrewing the pump, without tearing down the jack. The capacity of the jack is rated conservatively, safety being the first consideration. Each jack is tested beyond rated capacity at the factory.

Dick Prescott Talks Colors

And Steve Sees the Light



DICK PRESCOTT, assistant superintendent of the Consolidated Railway & Light Company shop, had taken Steve White, carpenter shop foreman, out into the shop to look over one of their most modern cars. Steve did not know what Dick had in mind, and so he looked expectantly when they paused before a car.

"Steve," said Dick, as he pointed toward the Consolidated's latest type of rolling stock, "look at that car and tell me whether you would paint your automobile that way."

"I don't get you, Dick," replied Steve, regarding his superior in mild surprise.

"Sure you do, Steve. Would you paint the doors of your automobile a different color than the body, or would you slap a solid color of green or yellow or orange all over your automobile body and let it go at that?"

"Why, of course not."

"Then why in the world do we do that on a street car?"

"Well, a street car's a different proposition."

"Why, Steve?"

"Oh, I don't know, Dick. I don't quite get you yet. We've always painted cars that way."

"That's exactly what I'm driving at. We started painting cars that way long before the automobile came along, when people had to ride with us or walk, and we've never given a thought to doing anything else."

"What have you got in mind, Dick? Goin' to put on a lot of these circus colors we've been reading about?"

"Not at all."

"Then I don't quite follow you."

"Listen here a minute, Steve. It's amusing to hear some of the serious discussion of this circus painting by people who don't understand what it's all about. Some of the properties that have put on bright colors with pennants and other decorations have done that merely to attract attention to the fact that there's a street car system in town. That's merely a passing phase in the effort to develop more attractive color combinations for cars, and painting schemes that will improve their appearance instead of making them look awkward and clumsy."

"That sounds all right, Dick, but what do you propose doing?"

"I think we ought to get away from that solid yellow we've had on these cars for fifteen years. Let's use one of the automobile man's bag of tricks that we see paraded before our eyes every day and that he uses effectively every time he brings out a new model. We could pick out a decent combination of two colors that blend well together and put a nice band or stripe between them so we could carry the colors all the way around the car."

"Do you mean that you'd paint right across the doors instead of keeping them finished in mahogany?"

"Sure."

"Well, I never saw that tried. Still I can't see but what it would look all right."

"There's only one way to find out how to do it, Steve, and that's to try it out. Let's take this car as a sample and see what we can do."

"That is easy, Dick. I'll bring some color panels up to your office tomorrow, and you can decide on the color scheme you want to try out."

"Good enough. We may have to try two or three combinations before we work it out, but I'm anxious to see whether Mr. Milburn, our general manager, isn't ready to spend a little money on paint to make these cars look a little less like box cars going down the street."

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Association Activities

New England Club Has Record Meeting

History of the Connecticut Company was outlined and New Bridgeport mercury-arc rectifier substation discussed before large gathering at Hartford

IN ACCORDANCE with its recently adopted policy of holding meetings in the various cities served by the larger operating companies in that section the New England Street Railway Club met on Dec. 8 at Hartford, Conn. The program was arranged by N. J. Scott, manager of the Hartford division of the Connecticut Company, and centered around the activities of that railway. About 200 members were present. This large attendance was said to establish a record for a regular quarterly meeting of the club.

Charles Rufus Harte, construction engineer of the Connecticut Company, presented an interesting outline of the 68 years history of his company and its predecessors serving the same territory. His talk was illustrated by lantern slides showing both the early days of the railway's history and the scope and character of its present transportation system. An abstract of his address appears elsewhere in this issue.

Rectifiers Supply Bridgeport

Mercury-arc rectifiers at the new Bridgeport substation were discussed by George Wood, power engineer the Connecticut Company. Early in the fall of 1926 studies had been commenced, he said, with a view to the creation of modern power facilities for the company at Bridgeport. The company's Seaview Avenue generating station was old and costly to operate. Its location was remote from the center of the load and there were considerable losses in the feeder lines. Another influential factor in favor of change of the source of power was the impending necessity to spend $60,000 for a new submarine cable crossing where the city was planning to relocate an important highway bridge. These studies indicated that the power demand of the railway could be met most satisfactorily by the erection of one substation in the vicinity of the Congress Street carhouse in the city of Bridgeport and a second in the town of Stratford.

Mercury-arc rectifiers were chosen for these substations for four reasons: (1) Efficiency; (2) ability to operate on either 25 or 60 cycles; (3) low maintenance cost; (4) freedom from heavy foundation requirements. The latter consideration was of great importance because the station is located on filled land. Accordingly seven 2,000-amp., 600-volt mercury-arc rectifiers were bought from the American Brown Boveri Corporation. The Congress Street substation, which carries the bulk of the load, is equipped with five rectifiers. It is manually operated. The Stratford substation has two rectifiers and is wholly automatic. For convenience and simplicity it was decided that all units at both stations should be of the same design.

Mr. Wood presented lantern slides showing the outdoor equipment, including the two incoming three-phase, 13,900-volt transmission lines, the auxiliary bus on each line ahead of the switches, the auto-transformers and the main 1,400-kva. transformers. These are designed to operate with three-phase primary at 6,600, 11,000 or 13,900 volts, while the secondary is double six-phase at 550 volts.

Other views were presented showing the interior equipment and arrangement of the station. The rectifier and feeder control board consists of twenty panels. At one end is the incoming line and auxiliary control panel. Next come five rectifier control panels with meters and protective apparatus. At the other end of the board are fourteen panels for feeder switches and circuit breakers.

Construction of the building was commenced March 27 of the present year, Mr. Wood said. Work on the equipment began May 15. The first unit was put in operation Aug. 15 and all were in operation by Sept. 26. No trouble of any kind has been experienced since these rectifiers have been in service and an over-all efficiency of 93 per cent has been obtained, including the line loss. A technical article concerning this installation will appear in a future issue.

The discussion was continued by John Egli, field engineer American Brown Boveri Corporation. He said that the reason for installing auto-transformers was to permit the station to operate at a greater variety of voltages than could be secured satisfactorily with ordinary transformers. He called attention to the fact that more than 800 mercury-arc rectifiers have been made by the Brown-Boveri company at Baden, Switzerland, and that street railway systems at Berlin, Germany, have placed orders for additional equipment.

Robert B. Stearns, president of the club, presided at the dinner and evening meeting. He paid tribute to the excellent work done by the officials of the Connecticut Company in arranging the meeting. J. K. Punderford, president of the company, said that the major part of the credit belonged to N. J. Scott, manager of the Hartford division. The latter spoke briefly and said that it had been a pleasure for the Connecticut men at Hartford to do what they could in arranging the program and making the meeting a success.

Transportation problems were touched upon briefly at the end of a talk by Richard T. Higgins, chairman Connecticut Public Utilities Commission. Mr. Higgins began his talk by mentioning the annual meeting of the National Association of Railroad and Utilities Commissioners held some time ago at Dallas, Tex. From this he went on to speak of industrial conditions in the South. Reverting to the subject of transportation, he said that the public will co-operate if informed of utility activities. Good service and courtesy, however, are essential to securing this co-operation. In Connecticut the commission's inspections showed the bus service rendered by the Connecticut Company to be the best in the state. This, he said, is primarily because it has trained men. He prophesied an increasing use of public transportation vehicles because congestion is causing people to keep their private automobiles at home. Nothing has yet been invented, he said, which equals the street car for efficient handling of mass transportation.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 6 — **Metropolitan Section, A. E. R. A., Engineering Societies Building, 39 W. 39th Street, New York, N. Y., 8 p.m.**

Jan. 16-17 — **Midwest Electric Railway Association, Hot Springs, Ark.**

Jan. 18-19 — **Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.**

Jan. 18-19 — **Central Electric Traffic Association, Hotel Gibson, Cincinnati, Ohio.**

Jan. 25 — **Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.**

Jan. 25-27 — **Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

Jan. 26-27 — **Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.**

Jan. 31 — **New York Electric Railway Association, annual meeting, Hotel Commodore, New York, N. Y.**

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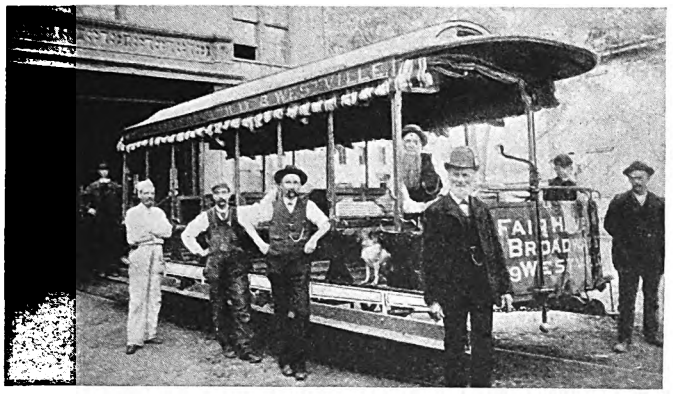
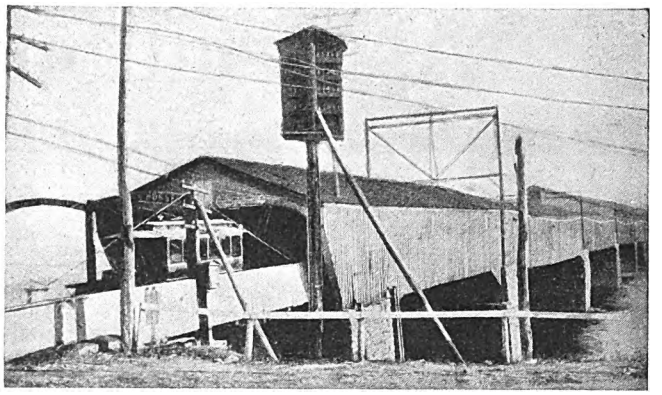




At left—Old Fair Haven, Broadway & Westville horse car. At right—the wooden bridge over the Connecticut River at Hartford. It was built in 1818 and made free in 1889. On May 17, 1895, the bridge burned

68 Years of Railway Service in Connecticut*

By Charles Rufus Harte
Construction Engineer the Connecticut Company, New Haven, Conn.

HISTORICALLY, the Connecticut Company dates from June 18, 1859, when its oldest line, the Hartford & Wethersfield Horse Railway, received its charter. Other lines followed from time to time until 1888. When electric operation began, there was a very considerable mileage throughout the state.

The New York, New Haven & Hartford Railroad made its first purchase of trolley stock, a controlling interest in the Stamford Railway, in 1895, but the principal growth followed the purchase, in 1902, of the Worcester & Connecticut Eastern, which under its new name of the Consolidated Railway, by purchase, construction and lease in the period ended June 1, 1907, created practically the present property, which on that date was put into the hands of the Connecticut Company, chartered for that purpose, to be operated by it. In 1910 the title to the property formally passed to this company.

In 1914, in connection with settlement of difficulties with the United States government, the Connecticut Company was placed in the hands of five federal trustees, appointed by the court, a situation which continued until Jan. 1, 1926, when the decree was dissolved and the property was returned to the New Haven Railroad.

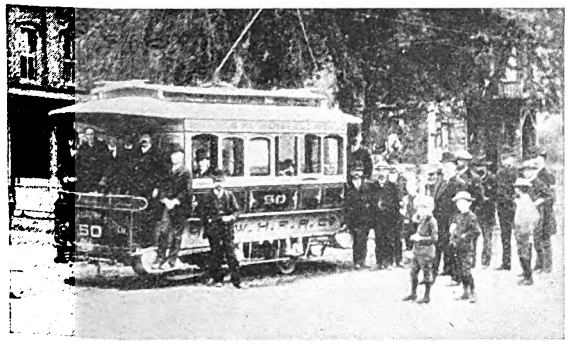
The system consists today of 514 miles of first main track, 185 of which is double, and 196 miles of bus routes, over which are operated some 1,323 passenger cars and 124 buses. These carried in the twelve months ending Oct. 31, 1927, the equivalent of 151,030,148 single fare, and 29,334,383 transfer passengers by cars, and 13,334,383 single fare and 1,821,545 transfer passengers by bus, the necessary power for the cars being in part generated by the three owned stations at New Haven, Hartford and Danielson, and in part purchased.

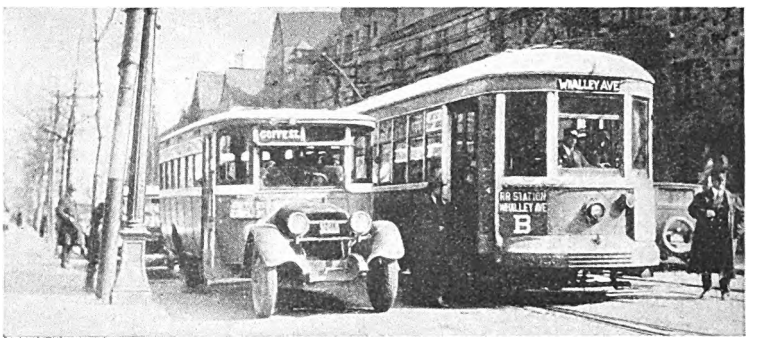
It was the thought of the late president of the New Haven system, Charles S. Mellen, that the way to make a railroad prosperous was to insure the prosperity of its territory, and he believed that good secondary transportation would bring that prosperity, resulting in a net gain if both groups were under the same control, although the secondary group by itself might actually be a losing proposition. The difficulties of the New Haven and the astounding increase in automobile use completely upset Mr. Mellen's calculations, but any criticism of the unfortunate outcome of some of the plans, to be just, must consider the purpose in view, and the totally unexpected development of later years.

The track structure today does not include any of the old strap rail on longitudinal stringers, nor some of the very light sections on metal chains, but while in replacement general standardization is going on there is still a large variety, partly hand-me-downs from old companies, but still having good service life, partly as the result of experimental work and partly due to special conditions. Today we have three general forms, open steam railroad type on private way, paved on wooden ties in the majority of the cities, and here in Hartford, where clay makes a great deal of trouble, paved on steel-and-concrete twin ties on a concrete mat with upturned edges, forming a trough.

These ties are precast, the increased weight making it far easier to line and surface the 134-lb. rail under which they are used, while their shorter length and less depth than wood ties effect a saving in the expensive mat construction that offsets the higher first cost. Joints are welded, using chiefly the arc, although there have been quite a few thermit welds. General maintenance costs have been steadily reduced by the employment as far as practicable, of the modern mechanical aids, ranging from cranes and steam shovels down to tamping tools and similar compressed air apparatus. It may be of interest to note that Con-

Abstract of a paper presented at a meeting of the New England Street Railway Club at Hartford, Conn., Dec. 8.





At left—Official trip of the first electric car in Hartford, on Sept. 12, 1888. At right—A modern car and bus of the present-day Connecticut Company

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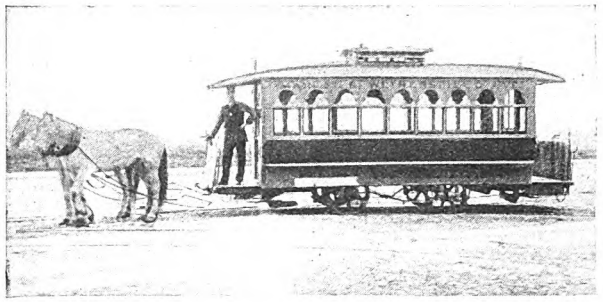
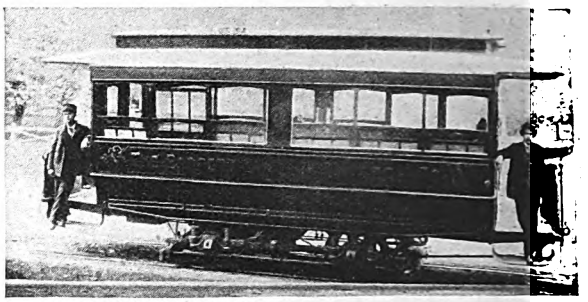


An early model of car for the Hartford & Wethersfield Horse Railway



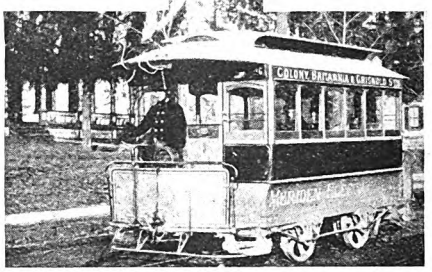
This car was placed in service in Hartford during 1890

necticut, recognizing the injustice of today requiring the trolley to pave a large proportion of the street for the use of its competitors, has cut down the paving requirement for the old one of all between lines two feet outside the outside rails, to eight inches each side of each rail.

The early motive power was that of the good old "hay burner," not unduly speedy, but reasonably dependable if conditions were not too adverse. The old track and the small flanges made a combination easily broken up, and it was regular procedure to turn the team to one side, drag the car off the rail, around some obstacle and back on to the track, which was apt to be pretty nearly as rough riding as the cobble paving.

The advantage of a different type of motor was early realized, however. In 1873 New Haven tried a compressed air motor which went out Whitney Avenue quite successfully, but came to grief in returning. A number of the properties were deeply interested in the developments in electrification, so much so that while the first successful commercial line, the Sprague system at Richmond, Va., began operation in February, 1888, Connecticut had three electrified systems in operation within eight months.

At Derby, a Van Depoele system started operation on May 1, 1888. The little cars had the motor on the front platform with chain-and-sprocket drive to the axle, and the collector was an underrunning wheel. James Kennedy, now roadmaster of the Derby division,



A Daft car at Meriden, using an over-running collector

had much to do with the installation and claims to have invented the first overhead frog. His description of how he made the pattern from the heavy pasteboard of the box which held his wife's wedding dress, and of the lady's reaction when she discovered it, is certainly convincing.

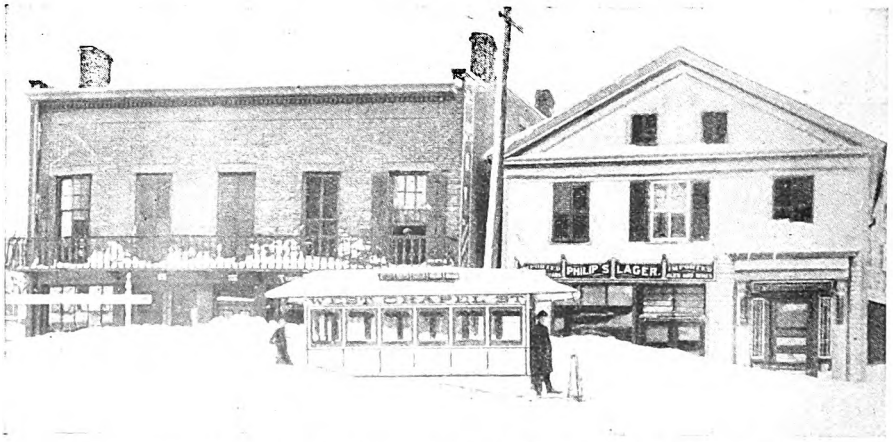
On July 1, 1888, Derby put in operation a Van Depoele freight locomotive, and while in the earlier experiments electric locomotives had been used to draw passenger trailers, so far as is known this was the first use of an electric locomotive for freight service in the world.

In Meriden, two months later, there was started a Daft system, using the overrunning collector, a real trolley, which gave the electric car its usual name. The two sides of the circuit formed the track for the collector, from which a flexible cable dropped to the car where it was so fastened that it could readly be disconnected. There were but the two wires overhead, and at sidings, while the cars passed, the trolleys were exchanged. The device proved a bad actor, however, readily running off its wire track, smashing in the roof of the car when, as was usually the case, it landed there.

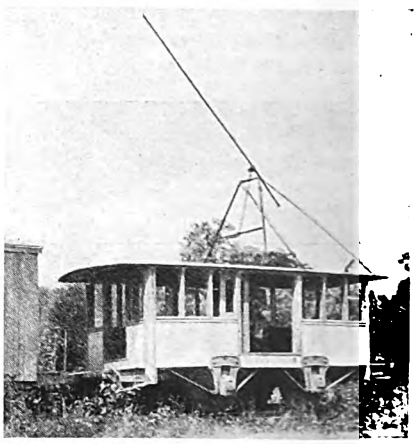
Hartford had been the first city in the state to have horse cars, and while it was a little slow in trying the new electric cars it was not very far behind Derby and Meriden, its Sprague system having a tryout on Sept. 12, 1888. The car looked more like a present-day trolley than the two others, and it worked well, but it was some time before all the city lines were electrified. During this period, about 1890, there was tried a Barrett storage battery car, made in Springfield, which ran for some time with varying success on Main Street.

New Haven held to the horse car even longer than Hartford. The first line electrified was that to West Haven, the first electric operation being the night of June 13, 1892; the last line the Dixwell Avenue, was electrified three years later.

Appreciating the possibilities of the bus, this company early gave the question careful study, but it was not until the Legislature of 1921 gave some measure of protection that regular operation was tried. Today we have a fleet of 124, furnishing transportation in those cases where there is a real necessity, but not enough to warrant construction of a car line; where highway changes required track reconstruction at cost which was not warranted by the traffic; and in a few instances where it has been possible by the use of the bus to give express service, notably in the case of the New Haven-Bridgeport line.



Snowbound. One of the experiences in the operation of the West Chapel Street line in New Haven



Van Depoele electric locomotive at Derby

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British Institute President Shows Economy of Electrification

R. T. SMITH, the new president of the British Institute of Transport, in his opening address delivered in London recently spoke on "The Advantages of Main-Line Railway Electrification." He drew attention to the results of six years' operation of the electrified portions of the Swiss Federal Railways. President Smith said that the time of the journeys made by express trains has been decreased 20 per cent and slower passenger services have been improved. Heavier freight trains are being hauled than was possible with steam locomotives, the average increase in trailing load up to last August being 47 per cent. The capacity of the Gothard line for carrying minerals has been doubled.

Electrification has not increased the cost of the permanent way. Together with the fall in the cost of wages, it has reduced the total cost of traction and of workshops, and has enabled 34 per cent more traffic in ton-miles to be hauled by the whole railway equipment, steam and electric, in the last four years without any appreciable increase in the traffic cost of working the trains and the stations.

Relative to English and Welsh railways, Mr. Smith said that the individual headings of expense in the working cost of the train-mile since the war average three times the pre-war cost, but will probably sink to double pre-war cost. Estimates for main-line electrification projects in Britain over long lengths of route show that the savings in working expenditure as compared with steam will pay on the cost of electrification from 5 per cent on fairly busy lines to as much as 12 per cent on lines fully worked with dense mineral and freight traffic throughout the 24 hours. The capital cost per route-mile of double track, estimated at £25,000 ($125,000) for suburban lines, will probably amount to £60,000 ($300,000) for main lines.

English and Swiss figures are not comparable, as English equipment is for density of traffic between two and three times as great as Swiss traffic. Speaking as an engineer, one-half of whose career has been spent in the railway service, President Smith said that perhaps some of his old railway colleagues would be stimulated to look at railway electrification not only from the point of view of saving working costs—although this can be done under favorable conditions—but that of increasing the earning power of a certain investment in way and works through increasing the average speed of freight train and slow train operation.

Co-ordinating All Transportation Facilities Under One Management*

By J. M. Shaw
Executive Secretary Mitten Management, Inc.

IT HAS come to be recognized in modern business that mankind withholds its greatest rewards for those who serve it best. It is the recognition of this truth which has changed completely in two short decades the public attitude toward "big business." The modern trend is all toward consolidation of related industries and industrial units. We gaze with mute approval at consolidations and mergers which fifteen years ago would have made us rush wild-eyed from the market place determined to pass a law.

We have seen the trend toward consolidation in our own industry and it is universally agreed that we need more of it. The problem facing our largest cities is how to bring it about fully and completely and in fairness to all.

The street car is now and is likely to continue to be the backbone of transportation in large cities. The motor bus has found a place of increasing usefulness in supplying boulevard service and in serving feeder lines in outlying sections, as well as in communities where the large initial investment in track and overhead is not justified. High-speed lines under and over the ground have contributed much in densely populated cities. The private automobile has won the hearts of many who formerly use public transportation. All of these facilities, however, have limitations which prevent them from replacing the street car.

Mitten Management, which operates the city transportation systems of Philadelphia and Buffalo, has arrived at the conclusion that every phase of city transportation must be brought under one direct operating control before this universal problem can be properly approached. By this means street space may be conserved. At the same time, the largest possible proportion of transportation earnings may be made available for expansion and improvement.

This principle has been applied in Philadelphia to a greater extent than in any other large city. The street railway lines have for many years been operated as a unit by the Philadelphia Rapid Transit Company, the numerous companies of earlier days having been brought together by the economic pressure of the need for a one-fare city-wide system. To this surface system have also been added the Market Street subway-elevated line, built by the company, and the Frankford elevated line, built by the city.

The development of the motor bus, because of the urge to "ride on rubber" and in view of the advance in the automotive art, was inevitable. We were confronted with the problem of meeting a new form of competition with the street railway lines. Decidedly the best way to meet this competition would be to use the resources of the existing system to develop a bus service which no competitor could hope to equal. Since 1923 we have steadily added to our bus equipment and are now operating buses over 200 miles of city streets at a 10-cent fare, assuming a seat for every passenger, and giving a connecting ride with street car and subway-elevated lines for 3 cents additional.

Even the motor bus, however, does not entirely meet the public desire for greater speed and comfort, and the taxicab in recent years has become increasingly a factor of competition with the existing facilities. P.R.T. accordingly purchased the Yellow Cab Company, the largest cab operator in Philadelphia, and has announced its intention of ultimately combining as part of its system all the taxicabs of the city. When this is accomplished, it will make possible the furnishing of a higher grade of service, with elimination of unnecessary cruising in the city streets and other economies.

The Philadelphia taxicab companies have submitted to the Public Service Commission a plan for the elimination of cruising. Under this plan the two smaller companies will be merged with P. R. T., leaving only two companies in the field. These will co-operate in the no-cruising plan. The cabs will thus operate so as to increase their own usefulness and at the same time give due consideration to the economical use of the street space in the interest of the great majority.

Not only does this co-ordination wipe out the wastes of competition and make for better transportation service, but it has the added advantage of keeping together in one fund the earnings of the joint system, so that as little as possible may be dissipated and the greatest possible share applied to help support new facilities supplied either by the company or by the city.

This entire transportation problem is vital to the future of every American city, and the one which solves it best will have a great commercial advantage over its less progressive neighbors.

From the standpoint of the private operator, there must be a readiness to submit to the process which transforms him from a street railway man, a bus man or a taxicab man to a purveyor of transportation. He must understand that, although his business has thus been co-ordinated with others, he is subject to more violent competition than ever before because of the development of the private automobile. He will be wise if he has his ear to the ground to recognize changes in the public taste, and by supplying every need win that measure of public good will which is priceless and the importance of which we have in the past been inclined to minimize. Our slogan for the future should be "Co-ordinate or bust."

**Abstract of a paper presented at the annual convention of the Pennsylvania Street Railway Association, held at Scranton, Pa., Dec. 1 and 2.*

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Better Organized Supervision*

By W. T. Rossell
General Manager Pittsburgh Railways

TO ORGANIZE is by definition to bring into systematic relation as parts of a whole. Electric railway properties are organized to produce local mass transportation of the best quality consistent with a low fare and a reasonable profit. Organization connotes supervision. A lone craftsman or artist, fashioning a completed article, needs no outside supervision. He is a complete organization in himself. At first, men were individualists, each supplying his own needs. The family and the tribe were the first steps in specialization. The history of civilization is the history of specialization.

To be successful, an organization must perform its functions well as measured by the standards of the day. It must also have the power to adjust and to adapt itself to changed conditions. Nothing is surer or more ruthless than change. Its victims strew the records of the past and are everywhere today. They include every kind of organization, from individuals to empires. So the value of an organization may be measured by the two qualities efficiency and adaptability. They are not synonymous, indeed they may be mutually exclusive.

Industry developed as men gradually discovered that by gathering in organizations they could produce and consequently have more. It was discovered that tools could be used to advantage; that one man could do one part of the work and others different parts. Some came to supply the materials; others to fabricate them.

These methods grew slowly, painfully, and often in a haphazard way. It was at times discovered that materials moved back and forth many times before the work was completed. Men frequently spent more time walking about than they did at work.

It must be obvious to all that as specialization increases the interdependence of individuals and groups grows. Some one fails and another finds himself without the proper tools or materials. His failure in turn reacts on others and the whole organization is affected. Whether the organization be a shop, a department or an entire street railway company, the better it is organized the greater the specialization.

Here is often a weakness of large organizations. They become unwieldy, there is a lack of co-ordination between the parts. This may develop into misunderstanding and even jealousy or hostility. This is by no means an uncommon condition in industry. We all have seen it. Here is the rôle of supervision. Its part is to clear the path; to study the problems; to bring out the facts.

The work as a whole must be coordinated and information must be disseminated throughout the organization. Obstacles must be removed, emergencies must be foreseen and plans must be formulated. In general, supervision performs the same functions for industry that the brain and nervous system do for the human being. The careful organization of supervision is nothing but the logical carrying further the idea of specialization.

"Organize, Deputize, Supervise"

When this is understood the further division of duties is simplified. In general, supervision divides itself naturally into three parts, which must be present whatever the size, organization, or type of work. The first includes research, planning, emergency and other things which do not come under the head of regular routine.

The second includes supplies, records and other matters that might be called auxiliary routine. The third includes the supervision of operations, the daily routine of the organizations. Each of these parts may comprise a considerable organization or they may all be included within one man; the natural division still remains.

There is often a tendency to have too little supervision. Its value is at times intangible and retrenchment is easily made by cutting the supervisory force. In a well-trained organization the loss may not at first be felt. Later, the organization may show a let-down, both in efficiency and in adaptability.

It is difficult to know the right organization. The only true measure we have is economic, and complete analysis is difficult. If we can lay our natural prejudices aside, and, over a considerable period of time, note a steady, uninterrupted, forward progress it is reasonable to believe that our supervision is well organized. This is especially true inasmuch as overmanning is almost as hurtful as undermanning. Someone has given as a formula for management: "Organize, deputize, supervise." To state it better would be difficult.

Abstract of a paper presented at the annual convention of the Pennsylvania Street Railway Association held at Scranton, Pa., Dec. 1 and 2.

Unselfish Co-operation Needed to Solve Traffic Problem*

By R. C. Haldeman
President Pennsylvania Motor Federation

NO ONE has yet, nor in my opinion will any one for some time, bring forth a complete solution of the present-day traffic problem. Many excellent ideas have been proposed and, conversely, many that are not worth the ink necessary to put them on paper. This will always be, so long as human nature is such that it views things from the individual standpoint and not strictly for the advantage of the greatest number.

The present-day habit of using our streets as a public garage is one of the greatest evils tending to increase congestion in the business districts of our municipalities. It is both a selfish and a time-wasting habit of the motor car owner. The individual apparently gives no thought to the inconvience that his action places on the many. It is a simple mathematical proposition to determine how many automobiles can be parked in one block. It is also comparatively simple to count the flow of vehicles through that block. Statistics show that the number of flowing vehicles overbalances those parked in the ratio of more than 7,000 to one. Need anything more be said on the question of selfishness?

But if the individual still insists on being selfish, let him consider the time that he is wasting. It averages at least ten minutes to get the car out of a garage in the morning. If it has been parked all night on the street, especially over a cold winter night, the time of starting is probably longer. He drives down town with his mind set on a particularly convenient locality in which to leave his car. At least 99 times out of 100 he finds that place occupied by an earlier riser, and he spends ten minutes more looking for some other niche. It is probably three or four blocks from his office or wherever he desires to transact his business. Another ten minutes lost. Figure out what this selfishness is costing in time per day, week, month or year. Life is too short to throw away all this time to satisfy a purely selfish whim.

Another thing that is helping to congest our streets and highways is the present-day indiscriminate use of the automatic traffic signals. The best method of handling traffic is to get it quickly out of the way, and this the automatic light surely does not accomplish. On the other hand, in the majority of cases, the automatic light causes periodic congestion and thereby creates a useless hazard. We are not arguing against the traffic light, but only against its automatic feature. Wherever there is need of protection, there is also the need of an officer, in whose hands should be placed the operation of the light. In our opinion, neither an officer nor his assisting light should be placed at any point before there has been a thorough, scientific study of the traffic flow at that point. The argument has been made that no municipality can afford the expense of placing traffic officers at all the necessary locations. In the first place, such an argument is inherently wrong in that

Abstract of a paper presented at the annual convention of the Pennsylvania Street Railway Association, held at Scranton, Pa., Dec. 1 and 2.

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every expense is justified that either tends to protect or save a human life, and in addition the proper kind of a traffic flow survey would probably disabuse their minds as to the necessity of such protection. Too many times many of our municipalities have been influenced by the suggestions of those who have formed a snap judgment of the wildest kind.

And now I come to the only real solution of the traffic problem. Two words express the idea, and those words are "unselfish co-operation." Nothing is ever accomplished in this world except by the co-operation of those interested. Surely we are both vitally interested in the lessening of congestion. You are avowedly public carriers. Each operator of a motor vehicle is a potential carrier. We both use the streets and highways—you through the privilege granted by your charter, and we motorists by reason of our citizenship. In time lost, in damage caused and in every conceivable way, we are both—your organization and the one which I represent—vitally affected. Let us both co-operate to the fullest extent in the attempt to better these conditions, which affect us both so vitally.

American Association News

Subjects for Engineering Committees

SUBJECTS have now been assigned to all of the committees of the Engineering Association, as announced briefly in this paper for last week. The report of the committee on subjects, giving these assignments, is given below:

Power Division

Special Committee No. 1—Review existing Manual sections of both power generation and conversion and power transmission and distribution; except Section D 200-26, covering specifications for electrical conduit construction, and Sections G 200-15 and G 201-21, which are assigned to special committees.

Special Committee No. 2—Continue the study of design and operation of mercury-arc rectifiers and mercury-arc rectifier stations, including standard specifications, particularly as to rating.

Special Committee No. 3—(a) Secure and compile information on power contracts and power costs, for confidential use at association headquarters, and (b) check detail of contracts obtained with Manual Sections G 200-15 and G 201-21 and determine whether any revision of these Manual sections is desirable.

Special Committee No. 4—Study desirability of the separation of current carrying apparatus and the control equipment in switchboard layouts.

Special Committee No. 5—Continue the subject of specifications for materials and construction for catenary trolley lines and prepare such additional specifications as may be considered necessary.

Special Committee No. 6—(a) Continue the study of trolley wire wear and breaks, with special reference to breaks due to causes other than normal wear, using the method outlined in previous reports and giving comparative wear on the basis of the car-miles operated; (b) determine to what per cent of the original cross sectional area trolley wire may be allowed to wear with maximum economy and safety, and (c) determine the practical and economical sizes of trolley support ears for general use and for various classes of service.

Special Committee No. 7—(a) Continue the study of inductive co-ordination and radio co-ordination maintaining contact with the American committee on inductive co-ordination, and (b) be prepared at any time to furnish information that may be desired.

Special Committee No. 8—(a) Continue the study of standardization of trolley wire reels, with the purpose of standardization, and (b) investigate braking devices on reels, in stringing trolley wires. Note: This committee should work in conjunction with the proper committee of the Division of Simplified Practice of the Department of Commerce in connection with the standardization of trolley wire reels.

Special Committee No. 9—Review Manual Section D 200-26, Specification and Form of Contract for Electric Conduit Construction, to determine the need for revising and enlarging this section in accordance with the suggestions made by the 1927 power transmission and distribution committee.

Special Committee No. 10—Study lightning protection of both car and line equipment. Note: This committee should consist of a joint committee of rolling stock and distribution engineers, in order that both phases of the subject may be given adequate consideration.

Special Committee No. 11—Investigate the comparative cost and reliability of overhead and underground d.c. distribution systems. This to include installation, operation and maintenance; obtain definite information from which city engineers and others interested in placing wires underground can be informed as to the relative costs and advantages of the two methods of distribution.

Special Committee No. 12—Investigate the use of ferrous and non-ferrous materials for overhead construction.

Special Committee No. 13—(a) Study the question of proper trolley voltage for congested urban districts with a view to determining the most desirable voltage under general conditions from the standpoint of operation and economy. To include the determination of the lowest trolley voltage which is suitable in city areas where it is impossible to reach the normal operating speed of the cars. Such things as operation of auxiliaries, such as lamps, air compressor motors, etc., to be considered, and (b) continue the study of the proper design of the distribution layout for automatic substations with particular reference to ties between stations and the use of sectionalizing switches.

Special Committee No. ( )—Determination of a measure of the use of labor and material in trolley line maintenance. Develop the practicability of establishing a standard by which the various methods of operating and maintaining overhead lines may be compared. Note: No committee has yet been organized to handle this subject, which was not discussed at the executive committee meeting, Oct. 5, 1927.

Purchases and Stores Division

Special Committee No. 1—Review existing purchases and stores sections of the Manual for revisions and corrections.

Special Committee No. 2—Study the advantages and economics of unit piling and standard packages and recommend a suitable system for use on electric railway properties.

Special Committee No. 3—Make a study of investment in material and supplies and the cost of operating stores with an analysis of the underlying data as to: (a) What is included in the account of Materials and Supplies by the various member companies; (b) what is charged to the account of Stores Expense; (c) what is the relation of stores expense to gross earnings, to cars and buses operated, to total investment in plant, to monthly disbursements, or to any other feature of investment or operation which will afford a basis for comparison and control, and (d) what are the physical or operating circumstances, if any, which have a special influence on the subject; also suggest the most practical and effective method of gaging the cost of operating stores to be used as a guide to good practice.

Special Committee No. 4—Recommend methods and practices for keeping price records and pricing materials and supplies received and issued.

Rolling Stock Division

Special Committee No. 1—(a) Review existing equipment Manual section with the exception of those referred to in 1 (b) below: (b) The standing committee on rolling stock will continue its study of revisions proposed in the 1927 report of way and structures committee No. 1, in Manual sections B 100-23, B 101-25 and B 201-24.

Special Committee No. 2—(a) Continue the subject of motor coach design and standardizations; the committee to continue to work in conjunction with the standardization committee of the Motor Coach Division and the Society of Automotive Engineers; (b) investi-

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gate maintenance methods and inspection schedules and consider prescribed standards covering limits of wear parts as a means of efficient and economical maintenance; (c) consider the matter of bus design from the standpoint of unit construction and accessibility to wearing parts which is of vital importance to economical maintenance, and (d) consider the standardizations of automotive foundation brakes, metallurgical content of drums and other features of the braking problem that would tend to improve conditions.

Special Committee No. 3—(a) Continue the study of car equipment with special reference to appearance, comfort and convenience. Work to be co-ordinated with the committee on unification of car design. This study to include subjects of car nosing, ventilation and the need of a thrust device for journal boxes, and (b) investigate the relative economies of new types of power drives.

Special Committee No. 4—(a) Investigate the subject of head and tail lighting requirements, in addition to rear end markers and any other accessory lighting, such as signal lights and destination lights; (b) investigate the illumination of electric railway properties from trolley voltage supply, and (c) continue the study of car lighting with a view to improvements and economies due principally to standardization and uniform practices. Develop recommended practice in lamp inspection on proper specifications for lamps for a given system.

Special Committee No. 5—Continue study of results being obtained with roller bearings for journals.

Special Committee No. 6—Continue the study of gear lubrication.

Special Committee No. 8—Continue to investigate side wear on brushes of ventilated motors.

Special Committee No. 9—Continue the study of reduction of noise in car operation.

Special Committee No. 10—Investigate the welding of wheels, flanges, collaborate with way and structures committee No. 6.

Special Committee No. 11—Continue study of overhead current collecting devices and recommend standards for trolley wheels.

Special Committee No. 13—Continue the study of limits of wear.

Note: Special committees No. 7 and No. 12 have been discharged for the current year.

Way and Structures Division

Special Committee No. 1—Review existing sections of the Manual on buildings and structures, way and wood preservation.

Special Committee No. 2—(a) Continue study of design of switch tongues and hard centers for special trackwork; (b) review specifications for castings in iron-bound, hard-center special trackwork, with the view of possible revision of requirements for depth of casting and general design; (c) study of design of expansion joints for street railway track; (d) maintenance standards for track switch tongues in paved streets. Note: Establish, if possible, a maintenance standard for electrically actuated track switches in paved streets. Switch points so operated should require closer attention as to cleanliness, limits of wear, adjustments, etc., than those not so operated. It is believed, however, that a standard of maintenance for electrically operated switches might be applicable also to manually operated switches. (e) Prepare suitable plans for street railway spring switches and frogs and prepare a specification and drawing of a suitable spring-actuating device, all of which is to be incorporated in Manual Section W-108-23; (f) prepare a special design or plan for the use of narrow-tread wheels, of double spring rail frogs with a spacer between the two movable wings so that they are only partly spring acting.

Special Committee No. 4—(a) Study matter of type of ballast for track construction in paved streets to determine the relative advantages of each type with special conditions of subsoil, car loadings, etc.; (b) investigate the use of vitrified or tile pipe auxiliary drains in connection with track construction in paved streets.

Special Committee No. 5—(a) Study of treatment of poles and timber in place; (b) study actual economies obtained by operating utilities through the use of treated timbers; (c) study wood preservatives other than creosote and zinc chloride, and (d) investigate the possibilities of a combination preservative fire preventive treatment for timber.

Special Committee No. 6—(a) Study arc welding processes for repairs to rails and manganese steel, co-operating with the Welding Society, and, (b) prepare welding wire specifications.

Special Committee No. 7—Investigate the possibilities from the use of alloy steels other than manganese for special trackwork purposes. Observations to be continued of installations of chrome nickel steel in special trackwork and that the experiment suggested by last year's committee be carried to conclusion.

Special Committee No. 8—Study types of pavements, contour and foundation and recommend types of construction suitable for the modern heavy load conditions on city streets.

Special Committee No. 9—(a) Study the effect of garage design on insurance rates (in co-operation with the N.F.P.A. and other interested organizations). This should include such items as (1) Types of heating plants, (2) design of inspection pits, (3) gas, oil and water servicing facilities for buses, (4) floor drainage, (5) ventilation, (6) fire extinguishing apparatus, including automatic sprinklers; (b) study of door design to include recommendations as to proper width of door openings, details of construction and general arrangement. This should cover such types as single or multiple sliding doors, plain hinged doors, rolling lift doors, jackknife or folding type and any other on which information may be obtained; (c) study maximum floor grades for bus garages; (d) study illumination both natural and artificial; (e) study bus washing facilities; (f) study provisions for compressed air lines for inflating tires, and (g) general study of ideal layout for various street frontage condition.

Special Committee No. 11—Co-operate with the A.S.M.I. in the consideration of any changes in the track and pavement construction specifications which may be proposed by either organization.

Special Committee No. 12—Continue study of rail corrugation; (a) continue collection of data from companies which are now co-operating, and (b) install sections of track for test purposes, with the end in view of determining a type of track which will better resist corrugation.

Special Committee No. 13—Study design of joint railway and bus terminals.

Special Committee No. 14—Study subject of rebranding rails to obtain uniformity in practice. Committee to study branding practice established by A.E.R.E.A.

Special Committee No. 15—Prepare a design of track gages for measuring and checking gage of track. Check gaging points on rails and wheels to determine if present practice is correct.

Special Committee No. 16—Study the subject of foundation and supporting structures for steam railroad crossings and other special work layouts.

Note: Special committees No. 3 and No. 10 have been discharged for the current year.

Committee on Heavy Electric Traction

1. Review existing Manual sections.
2. Continue study of track and third rail bonds for heavy traction work.
4. Continue study and collection of data on branch lines electrification and self-propelled cars and locomotives.
5. Continue study of operation of articulated trains, collecting descriptive information.
6. Study train make-up and terminal switching with multiple-unit cars, collecting and compiling data on same.

The report was signed by F. H. Miller, chairman; Morris Buck, C. H. Jones and P. V. C. See.

Service Betterment

WORK for the coming year was planned at a meeting of the committee on service betterment held at association headquarters, New York City, on Dec. 13. It was decided to concentrate on three subjects: Speed, training employees, and utilizing old equipment to the best advantage. Subcommittees were appointed to study each of these subjects. The next meeting will be held at Cincinnati in January at the time of the meeting of the Central Electric Railway Association. Members present at the meeting were W. E. Wood, chairman; R. N. Graham, J. F. Craig, E. A. Palmer, C. W. Wilson, E. E. Bodine representing C. L. Van Auken, and Paul Wilson, sponsor.

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News of the Industry

Messrs. Hughes and McAdoo Appear in Piedmont Case

Oral argument was heard on Dec. 9 before the Interstate Commerce Commission on the application of the Piedmont & Northern Railway to construct an electric line from Spartanburg, S. C., to Gastonia, N. C., a distance of 53 miles, and from Charlotte to Winston-Salem, N. C., a distance of about 75 miles.

An Interstate Commerce Commission examiner ruled against the proposed construction, holding that it would result in unwarranted duplication of existing railways; would impair their facilities, by diverting their traffic, and would not perform any service that cannot now be performed by existing lines.

Charles Evans Hughes appeared for the Piedmont & Northern, while William G. McAdoo appeared for the Georgia & Florida, which is supporting the Piedmont's application. Mr. Hughes argued that the proposed construction was part of a project begun in good faith prior to the enactment of the transportation act. He asserted that public officials and representatives of various industries were unanimous in their support of the proposal, and termed as a "figment of the imagination" the charge of the Southern Railway that it would injure that road's credit.

The Piedmont & Northern further claims that since it is an electric road it should be classed as suburban and that the commerce commission for this reason does not have jurisdiction. It also claims that since the road was started before the present law became effective, and was delayed in completion by the war, this is an additional reason why the commission cannot take jurisdiction at this time.

The Southern Railway and other steam lines are opposing the application.

Preservation of 5-Cent Fare Involved in New York Suit

In a brief filed on Dec. 9 with the Appellate Division, to which the City of New York has appealed from a ruling of Supreme Court Justice Wasservogel, William G. Fullen, counsel for the Board of Transportation, argues that the preservation of the 5-cent subway fare and the saving to the municipality of millions of dollars is dependent upon the four-year bond policy recommended by John H. Delaney, chairman of the board.

William Jay Schieffelin opposes the board's policy on the method of financing and advocates a 50-year bond program. He brought mandamus proceedings to enforce his theory and to restrain the Board of Estimate from including an item of $13,000,000 for amortization in the 1928 budget.

Included in the brief filed by Mr. Fullen was the assertion that "on the basis of the proposal to issue four-year bonds at 5 per cent, the cost to the city of $1,000,000 of rapid transit bonds would be $200,000, whereas under the existing 50-year bond plan the cost of $1,000,000 in 5 per cent bonds at the rate of $50,000 in annual interest would be 50 times greater, or $2,500,000."

The brief contends that the plans adopted will make possible uninterrupted progress in subway construction without creating a situation which would hinder the continued development of other public works. It urges, also, that a writ of mandamus is not the proper remedy, and that the determination of the financial policy to be adopted is within the discretion of the Board of Estimate and is not subject, under the terms of the city charter, to judicial review.

The brief denies that the Board of Estimate is restricted to the issuance of bonds for a minimum of twenty years duration, as Mr. Schieffelin contends. It contends that the financial policy advocated by Mr. Schieffelin would be very costly to the city in comparison to that formulated by the Board of Estimate.

Elimination of Parking in Downtown St. Louis Recommended

Director of Streets and Sewers Brooks of St. Louis, Mo., has caused to be presented to the Board of Aldermen a bill to eliminate all daytime automobile parking on Washington Avenue, Locust and Olive Streets in the downtown district. No parking will be permitted on the streets named between Fourth Street and Twelfth Boulevard between the hours of 7:30 a.m. and 6 p.m.

Director Brooks declared that this legislation was vital because "traffic was strangling itself through its own bulk." He took the position that parked cars at the curbing in the retail business sections of the city not only impeded the free movement of street cars, buses and other automobiles and horse-drawn vehicles, but also discouraged downtown shopping.

Clearing the Atmosphere in Chicago

City Council and companies resume franchise negotiations. Corporation Counsel to study company suggestions and report back. Mayor Thompson to take a hand

REFUSAL of the surface and elevated lines of Chicago to accept a franchise for a fixed term of years or for legislation providing for termination of grants by forfeiture of their properties marked the reopening on Dec. 9 of the first joint meeting of local railway executives and the members of the City Council transportation committee since the bills representing the city's views on legislation necessary to solve the local transit problem were completed and handed over to the companies for study and revision on Dec. 1.

The principal differences between the revised bills and the companies' bills, which were killed at the last session of the State Legislature, are the provisions for granting by the city of either a terminable permit or a long-term franchise and for increased representation of the city on the proposed local transit commission.

Patrick J. Lucey, attorney for the Chicago Rapid Transit Company and also delegated to speak for the Chicago Surface Lines, contended that the forfeiture clause was unnecessary in the terminable permit bill, whereby the city would be allowed to specify in its ordinance what should constitute cause for termination, and that it would have a bad effect on the sale of the securities of the proposed unified transportation system. He said that in order to finance the proposed consolidated system perhaps as much as $500,000,000 would be required. As he sees it, the public would only invest its money in these securities if it were sure that they were safe from political interference. He illustrated this point by referring to the present depreciated value of Chicago Surface Lines securities. The value of these lines as shown by their capital account, he said, has probably greatly increased, but under the rigid twenty-year franchise the value of their securities will probably never increase.

In lieu of this feature, Mr. Lucey proposed an amendment allowing the city not only the right to buy the lines itself in case of non-performance, but to designate a purchaser to act under the same terms as those open to the city.

In commenting on the third bill, amending the cities and village act to permit term franchises for a period not to exceed 40 years, the companies' spokesman repeated that only a terminable franchise is acceptable. If, however, the bill is approved, he suggested that the length of the term

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grant be left to the option of the City Council. In reply to the Aldermen's objections that such an arrangement would remove the city's only safeguard against franchise abuses, Mr. Lucey declared that the people would be amply protected by "home rule" and the right of appeal to the courts. He said the companies were perfectly willing that the city and the public be protected, if the companies also were protected against confiscation.

Except for a few changes in legal phraseology, the consolidation bill is acceptable to the companies, as is the bill which would create a local regulatory commission.

The railway attorney's criticisms were forthwith referred to the city Corporation Counsel, who will study them in company with the local transportation sub-committee and make recommendations back to the full committee.

A Necessary Supplement to a Luxury

Baltimore brief so sees the street railway of the present day. Picture of changes affecting electric railways presents economic factors in a fascinating way and in terms readily understandable

DECISION is expected soon in the case now pending before the Public Service Commission of Maryland in which the United Railways & Electric Company, Baltimore, seeks:

(a) A flat 10-cent fare, with corresponding increased special fares.

(b) An increased annual allowance for depreciation that will approximate 4 per cent of the value of its depreciable property.

Briefs were filed by the company and by attorneys representing opponents, and arguments were made before the commission on Dec. 8 and 9, after a protracted hearing, during which 122 exhibits were filed with the commission by all the parties. The company contends that without the advance in fare and an increased depreciation allowance it cannot render adequate service and earn a return on its property consistent with its constitutional rights. The company seeks "not less than a fair return on the fair value of the property and not more than the value of the service to the customer."

The company's position as stated in its brief is:

1. "Flat" 10-cent fares (with corresponding increased special fares) are in themselves reasonable to its customers — not more than the service is worth.

2. Such increased fares will yield the company less than a fair return on the fair value of its property—even less than the constitutional protection against confiscation.

3. Compulsory limitation of the company's rates to yield a maximum of less than 8 per cent is confiscatory.

The company contends that "a 10-cent fare would now give the customer more for his money than the pre-war 5-cent fare gave him." It offered evidence to show the public's capacity to pay the 10-cent fare and discussed the changed conditions in the electric railway business as a result of the increased number of private automobiles now in use. It declares that the railways today are "a necessary supplement to a luxury."

The company states in its brief:

. . . the very nature of the service has been revolutionized. The population lives—and to a considerable extent dies—on wheels, moving or parked; not street car wheels. Automobiles not only take traffic from the street cars; they block what they do not take. Municipal regulation only aggravates the parking nuisance; automobiles are kept moving from place to place playing "tag" with the public. The number of automobiles participating in the nuisance—and the extent of the interference with street cars—is thereby increased. Pleasure riding on street cars is a thing of the past. Children and flappers alike get no "kick" out of a street car ride. The company still conducts pleasure resorts, which provide the jazz necessary to existence, but the patrons (who can neither park a street car no "step on the gas" in one) are largely transported there in automobiles.

Formerly the exclusive means of transportation for practically all, the street car is still a vitally necessary service for practically all, exclusive for almost none. Seventy-five per cent, men and women, go to and from work on street cars, 25 per cent in automobiles. For the 25 per cent the street car renders "break-down" service only; for most of the other 75 per cent a supplemental, stand-by service. The majority of families in and around Baltimore must own an automobile; perhaps the majority of the 75 per cent who go to work on street cars. Those who do not own automobiles are largely transported by those who do; many, both white and colored, use some of the 4,000 taxis, who never used the 233 hacks and cabs of twenty years ago; others patronize "drive-it-yourself" concerns. The workers, men and women, use the street cars at the same peak hours; other members of the same families use the family automobile at off-peak hours. Thus, while the company's passenger revenue and revenue passengers continue to decrease, its peak burden is actually increasing. The public demand for the automobile has thus changed street car service from an exclusive, all-day, night and holiday service into a peak and stand-by service, essentially different and more expensive, though still far less expensive than the automobile.

The value of the service rendered by the company and the public's capacity to pay for it "are alike demonstrated by the very demand for automobiles which has made this service necessary and the capacity to pay which has made this demand possible," the brief states.

The company points out that the use of automobiles has increased even more than the number. The company says:

Generally speaking, service worth having is worth what it costs, including in such cost, of course, a fair return on capital. This is the economic law in the competitive field when buyer and seller are free to pick and choose unregulated and unrestricted. Prices fluctuate up and down with fluctuations in demand and supply; when demand and supply are balanced prices reach their normal level at cost of production (i.e., reproduction.) Public regulation does not diminish the value of service, though it may diminish or, unwisely exercised, may increase the cost of service. Though a street railway system remunerative as a whole may under exceptional circumstances include some unremunerative parts, the general rule is that not only the whole business but each part should yield substantial compensation over cost. Certainly the service as a whole, if it is worth having, is worth paying for.

The point is made that "value of service to the customer is not less, but may be and frequently is much more than is commonly paid for such service." What is paid in other cities is held not to be conclusive as to what ought to be paid in Baltimore, "because costs—and also franchise conditions and other contractual legislation preventing fare changes—are seldom the same in two places." Nevertheless, says the company, the fact that 219 cities throughout the country have a base fare of 10 cents, and that Boston and 29 cities smaller than Baltimore have a flat fare of 10 cents, "is conclusive evidence that 10 cents is not more than a street car ride is worth. In other cities lower fares are less than the service is worth. If a fare lower than 10 cents would yield this company a fair return on its property, then such a fare would enable the customer to get the service for less than its value to him. Since a lower fare will not yield a fair return to the company the customer is not entitled to such a saving; in a 10-cent fare, however, he will pay no more than the service is worth."

The company meets squarely the prophecy that an increased fare would cause "losses of business so heavy as to decrease revenue in spite of increased fares." After the increase to 7 cents on Dec. 31, 1919, passengers increased 10,000,000, from 244,000,000 in 1919 to 254,000,000 in 1920. The decrease to 225,000,000 in 1926 includes the loss of 10,000,000 fares (not passengers), though counted as passengers, through zone extensions," the brief states. The company says:

Sometimes increases, sometimes decreases in railway business have occurred after fare increases or decreases but seldom have resulted from them. Not only in Baltimore but in Boston and throughout the United States, whether fares have been increased to 10 cents or to lower amounts or have been decreased, the evidence shows no substantial effect of fare increases or decreases on the volume of business. Even if the data submitted had shown that in most cases increases in fares were followed by a noticeable falling off in riders, and vice versa, this alone would not indicate that such change in fare was the cause of the change in riders, because fare increases are ordinarily applied for and

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granted on a falling traffic and fare reductions ordered when business is increasing. As. Dr. Hollander (Jacob H. Hollander, professor of political economy Johns Hopkins University) expresses it, the demand for street car rides is relatively "inelastic." The last decade of street railway history, including the disastrous story of receiverships of many interurban and suburban and a number of urban street railways, reveals practically nothing about the economic limit to productivity of increased fares. Not one instance has been found of a company which lost money through too high fares or has gained or saved money through reducing or not increasing fares.

An interesting statement is made in reply to pleas of opponents of the company that the commission consider the "necessitous rider" and the social plight of the unemployed and of the entire families. Says the company:

If the term "necessitous rider" is intended to indicate the fact that the company's service is a necessary service, this fact is admitted; to none is the service more necessary than to the automobile owner who uses it as "break-down" service and stand-by service. The necessity for the service is no reason why it should not be paid for. If "necessitous rider" means the rider who does not own an automobile, then it is equally true (1) that the changed economic conditions caused by the automobile, not by the company, are facts which can no more be escaped by the company or by those who do not own automobiles than changed physical conditions can be escaped by the hapless pedestrian and (2) that with generally increased wages and standards of living the minority families who do not own automobiles are even better able to pay carfare than the majority who have automobiles to support. The unemployed, like the sick, the injured, and other unfortunates, cannot get food, clothing or shelter without paying for it, but they need not pay carfare at all.

The following paragraph is an interesting commentary on the changed social life of the public:

Women do not go to work to pay carfare; they may pay carfare to go to work. They go to work in increased numbers largely to help pay the cost of automobiles and other luxuries formerly rare, now general. Formerly the same street car carried a man to work at the peak hours, a woman shopping at off-peak hours, and in summer both to a park or pleasure resort at night. Now street cars carry both the man and woman to work at the same peak hour, neither of them at other hours while they are at work or at night while they are out in an automobile. Thus the amount of railway business is decreased, but at the same time the peak load is increased.

In discussing the economic changes further the brief states:

No other utility has suffered an economic revolution more complete or more obvious than the change in the railway business from a monopoly of local transportation for both necessity and pleasure, operated at minimum expense, to the status of a supplement, albeit an indispensable supplement, to the automobile, which now dominates transportation, not to say life itself in America. An inexpensive necessary monopoly has become an equally necessary but also expensive supplement to a more expensive luxury. The bulk and the burden of transportation still are and must continue to be borne by the street railway; the changed conditions of this transportation, however, including diminished receipts and increased expense, are controlled by the automobile.

In every aspect of the matter the passenger who pays a 10-cent carfare in the Age of Jazz gets more for his money than did the passenger who paid a 5-cent carfare in the Age of Innocence.

In an exhibit filed with the commission the company estimates that its revenue for 1928 on the basis of flat 10-cent fares would be $5,578,079, or 7.1 per cent of $78,005,270, the fair value of its property. It contends that this return would be less than a fair return on the fair value, "even less than the constitutional protection against confiscation." In making its estimate the company provides an allowance of 3 per cent decrease in passenger revenue to cover the present decrease in revenue passengers, and 2 per cent to cover any possible decrease due to increased rates.

The company also is contending for an increased depreciation allowance. It declares that $2,200,000, approximately 4 per cent of the undepreciated base value (exclusive of overheads and going value) of the company's depreciable property as valued by the commission, plus additions since Jan. 1, 1924, would be a reasonable annual allowance, in order to provide for retirements as they occur from year to year, without accumulating any substantial reserve.

It also contends that "compulsory limitation of the company's rates to yield a maximum of less than 8 per cent is confiscatory." The brief says:

For some years railway properties have not been earning 8 per cent. The return has not been sufficient to induce investors to build railways at all or to buy them on the basis of an expected return of less than 8 per cent. Railways have been unable to complete successfully for capital with other lines of industry. The credit of either a power company or a telephone company is much better than that of street railways. The most serious hazard of railways is inability to get a return. Another hazard of utilities is the difficulty in promptly advancing their rates to overtake increases in cost of operation. In all these respects the condition and the credit of railways are worse than before the war.

Meeting the question of opponents, "Why should the expense of a declining business fall on its present customers in increased fares?" the company says:

Why not, if the fares are not more than the value of the service to the customers and not more than a fair return to the company? Even in a self-exhausting business, regulated or unregulated, e.g., natural gas, coal, oil, etc., service must be paid for at what it costs. Constitutional rights of property are the same in respect to a waning business or a growing business. The company's business, however, is not a waning business as to customers, though it is as to earnings. Its propery is all used, useful and necessary in the public service; its service is used by everybody, but not to the same extent as formerly. The peal. burden on the company and its property continues to grow. The public, who require this peak service, make less use of the company's service at other times than it formerly did. All this is no reason why this changed service should not be paid for at a changed price necessary to compensate for the changed cost caused by the changed use which the public sees fit to make of the company's property.

Another Readjustment Move Presaged in New Jersey

Amended articles of incorporation have been filed for the Public Service Transportation Company, Newark, N. J. The move is believed to be the result of almost a year's work on the part of a committee of directors appointed to work out a plan for the readjustment of the transportation units of the Public Service Corporation. The transportation company is the bus operating concern and the only changes made by the new articles of incorporation are in the charter which is now issued under the transportation act. The Public Service Railway is the trolley operating company of the corporation. Under the new charter the transportation company will have 1,500,000 shares of common stock, of no-par value, which is the same amount as now held by the old transportation company organized under the general corporations laws. Under the traction act it will be possible to merge the two transportation units of Public Service when the time comes.

Agreement Reached in Chicago

Following a series of conferences between the operating board of the Chicago Surface Lines and representatives of Local 241 of the Amalgamated Association, a supplemental agreement for arbitration of wages and other points at issue was signed on Dec. 12. The agreement removes the possibility of a strike and as a result the proposed mass meeting of the union set for Dec. 14 was canceled by William Quinlan, president.

Under the terms of the new agreement, Judge Scanlan and Mr. McIlraith, appointed last summer, withdrew as arbitrators and Guy A. Richardson, vice-president of the Chicago Surface Lines, representing the company, and Alderman Oscar F. Nelson, representing the union, are appointed in their stead. If they cannot reach an agreement, they must proceed to select a third man and then consider the whole matter. In case of an agreement between the two arbitrators, they are empowered to make an award which can be continued in effect until June 1, 1930, but if they require the assistance of a third arbitrator the award can be extended only to June 1, 1928. The two arbitrators are to meet from day to day for the purpose of reaching a decision.

The agreement was submitted to and approved by Judge James H. Wilkerson of the United States District Court, owing to the fact that the Chicago Railways, one of the underlying properties, is in receivership in this court.

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They Miss Their Interurban, Do Holland Merchants

When the Grand Rapids, Holland & Chicago Interurban Company went out of existence last year it proved a bad blow to industries in the city of Holland, Mich. In the southwestern part of the city were many industries that were equipped with sidetrack facilities to the interurban line, assuring them prompt shipments day or night. When the interurban road was junked the industries had forcibly brought to their attention the value of the interurban to the city. Shipments were delayed, trucks had to be purchased and resort made to other measures in meeting the need of shipping facilities.

A Chicago company tore up the tracks leaving the right-of-way in the hands of the Consumers Power Company, Grand Rapids. Now these industries have awakened and have leased the side track rights-of-way and are using the interurban rails to finish connections with the Pere Marquette Railroad with which they were formerly tied by rail. The interurban roadbed is being used, but new switches, rails and other equipment are being installed by the Pere Marquette Railroad.

Ten Cents in Lansing

New fare rates on the lines of the Michigan Electric Railway in Lansing, Mich., went into effect on Dec. 14. The new rate is 10 cents cash, with three tickets for 25 cents; 5-cent children's fare and seven workmen's tickets for 50 cents.

Information Bureau in Baltimore

The United Railways & Electric Company, Baltimore, Md., has opened a general information bureau for the public at 5 South Calvert Street, Baltimore, with Harry W. Mears of the company's service department in charge. Here complaints will be received and adjusted and all information dealing with the railway system and the city generally will be supplied.

A Wise Administration Expected in St. Louis

The press no less than the public has started the reorganized St. Louis Public Service Company on its new task with encouragement and hope for a bright future. In its editorial columns the St. Louis *Globe-Democrat* has this to say on the new start for the electric railway system:

> And St. Louis may take courage in viewing the character of the directors elected to manage the new Public Service Company. They are local men of affairs who have displayed their talents for the direction of large enterprises in many ways. They personally enjoy and deserve the confidence of the general public and are intensely interested in the progress of St. Louis, and the surrounding territory as a business community and a home center. Aside from uprightness of character, these directors will take a broad view of their responsibility in handling the affairs of the transportation company and build for the stockholders and for the community in conformity with the mutuality of interests.

A New Guide for Milwaukee Visitors

A new railway and bus guide of Milwaukee, Wis., and suburbs containing a map and index of streets, parks and other points of interest is being distributed by the Milwaukee Electric Railway & Light Company. The map in a greatly enlarged form is being placed in hotels and newspaper offices.

For the Benefit of St. Petersburg Pass Purchasers

R. E. Ludwig, director of public utilities at St. Petersburg, Fla., has announced that arrangements have been completed for the sale of weekly passes and street car tokens for the municipal railway at the new municipal bureau of information and complaints at the City Hall each Saturday afternoon hereafter. The passes go on sale regularly each Friday for the following week at the municipal railway office in the finance department, but that office is closed to the public at noon on Saturday, when the sales will be transferred to the information bureau.

Ten Cents in Atlanta

Ten cents cash, four tickets for 30 cents or twenty for $1.50, with school children's rates, 5 cents, are the new fares to be charged by the Georgia Power Company, Atlanta, Ga., set down in an order of the Georgia Public Service Commission on Dec. 6. The present fare is 7 cents cash, three tickets for 20 cents or fifteen for $1, with no children's rates.

The school children's tickets are to be sold in lots of twenty for $1 at the company office on presentation of a certificate signed by the principal or teacher. These tickets are good on school days between the hours of 7 a.m. and 4 p.m.

In the company's petition to the commission a request was made for a 10-cent cash fare and three tickets for 25 cents.

Office Changes Made

Passenger and freight offices of the Chicago, North Shore & Milwaukee Railroad in Milwaukee have been moved from the Security Building to the terminal building of the road. The space formerly occupied by the restaurant has been remodeled. B. W. Arnold and the legal and medical representatives will remain in the Security Building.

New Routes Opened in the Twin Cities

Operation of cars of the Minneapolis Street Railway, Minneapolis, Minn., over the new bridge across the Mississippi River to a point adjacent to the plant of the Ford Motor Company in St. Paul was begun Dec. 2, the day the new Ford car models were put on display in the Twin City plant. The tracks were laid several months ago, but the Kenwood-East 25th line has heretofore looped several blocks from the bridge. Extra service was put into effect on the Randolph-Hope line to the Ford plant by the St. Paul City Railway in anticipation of increased activity there.

The Bryn Mawr line in Minneapolis was reopened Dec. 3 over a new bridge across the Great Northern & Minneapolis & St. Louis Railroad tracks after being interrupted several months. This enables the company to reduce emergency bus service to Bryn Mawr by another route.

Extension of the Franklin Avenue line in Minneapolis and a proposed route to serve prospect Park residents up to the St. Paul city line has been approved by the City Planning Commission, and was reported as being up to the City Council for action. The route obviates engineering problems due to grades by direct extension across Franklin Avenue to the city limits.

Free Rides in Fort Wayne

An innovation in transportation was tried out Dec. 1 in Fort Wayne, Ind., with fine results with the Indiana Service Corporation aiding in opening the Christmas shopping season in the downtown business district by providing free transportation to every one between 6:30 and 7:30 in the evening in order for them to get to the shopping district early and free. Hundreds took advantage of the offer and went to the business district who would probably not have gone otherwise. The free ride stunt appears to have paid big dividends in good will.

Educational Courses in Michigan City

A short course for the benefit of its employees to acquaint them with the essential facts concerning the line and its operations and to fit them to tell the railroad's story to the public has been started by the Chicago, South Shore & South Bend Railroad. The first meeting of the class in which members of all departments are enrolled was held Dec. 1 in the South Shore Line's new Michigan City, Ind., station. The course of instruction will consist of a two-hour session one night each week for eight weeks. A well known lecturer and public speaking authority of Chicago is in charge. Students will be instructed in public speaking and the operation of stereopticon and moving picture machines.

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Public Hearing on Kansas City Short Line Project Concluded

Public hearing on the application of the St. Louis & Kansas City Short Line Railroad for a certificate of convenience and necessity for the operation of an electric railway between St. Louis and Kansas City was concluded by the Missouri Public Service Commission on Dec. 9. J. B. Collins, Kansas City, one of the chief promoters of the enterprise, declared on the witness stand that he believed the bus and motor truck competition with the railroads was not the bugaboo that the steam railroad officials believed it to be.

Mr. Collins was subjected to a searching cross-examination by Judge J. F. Green of the Missouri Pacific, Carl Hoffman of the Missouri-Kansas-Texas and L. H. Stroesser of the Wabash. They were especially anxious to ascertain how the short line railroad, if built, would develop new business to support it. In reply he stated that new business would be developed by the establishment of industries along the line and through the development of resources that are now dormant. He estimated the business of the new road would total $5,000,000 annually. Judge Green in this connection pointed out that $5,000,000 was more than the annual business of any of the steam railroads between St. Louis and Kansas City. Mr. Collins answered that he felt his line would get the bulk of the business for the reason that it would be the shortest line between the cities and that it would operate through trains on a five-hour schedule, while at present the steam lines require seven hours for the trip.

The commission will fix a date some time in January for hearing arguments of counsel in the case. In the meantime both sides will file briefs. The Wabash, Missouri-Kansas-Texas, Chicago & Alton, Chicago, Burlington & Quincy, Chicago, Rock Island & Pacific and Missouri Pacific lines opposed the application of the interurban line. The line has sought since 1925 to obtain a permit to construct and operate. The commission rejected the first application on the ground that the company was not in a position to show its financial backing. A new application was filed Oct. 7.

Men in St. Louis Propose Wage Survey

W. R. Schneider, attorney for the local division of the Amalgamated Association, has been authorized to conduct a survey of the wage situation and also living expenses in other large cities. He has indicated that it will be several weeks before he is ready to report to the wage committee, which has been authorized by the executive committee to seek a revision of the wage scale in force by the St. Louis Public Service Company. Union officials say that St. Louis ranks ninth in the cities paying the highest wages to trainmen, now paid 56 to 67 cents an hour, according to length of service. Men working as laborers in the track division receive 38 to 45 cents an hour.

A Railway Employs Boy Scouts

The Retail Merchants Association of Lynchburg, Va., unable to charter street cars to haul their prospective Christmas shoppers to the stores, hit upon the happy idea of placing a Boy Scout, with a pocketful of nickels, aboard each car of the Lynchburg Traction & Light Company for one hour one morning recently. The youngsters distributed fares to all who requested them. Hundreds of women shoppers took advantage of the offer.

Hearing on Petition Postponed

Hearing on the application of the Pacific Gas & Electric Company and the Central California Traction Company for a 7-cent fare in Sacramento, Cal., has been postponed until Jan. 4. It had been scheduled for Dec. 6. The present rate in Sacramento is 5 cents.

"Northern Lights" on Thursday Nights

The Northern Ohio Power & Light Company, Akron, Ohio, continues to broadcast a program every Thursday night between the hours of 8 and 9 for the purpose of advertising its service. An orchestra has been organized known as "The Northern Lights," and usually there are two vocalists who broadcast over WADC. During the holiday week it is planned to use the First Congregational Church choir and St. Martha's Church choir.

Improved Service Means Higher Fare, Say Madison Employees

Employees of the Madison Railways, Madison, Wis., at their regular meeting adopted a resolution favoring an increase in fare as a solution for the improvement of service. The resolution follows in part:

1. We operate the cars and buses to give the best service we can. We try our best to avoid accidents, to be courteous to patrons, and to run the cars on time.
2. We know the company is spending every dollar of its present income to give the best service it can and that, in spite of this fact, we cannot keep up with the service demands of the public.
3. We have faith in the future of Madison and we want to see our customers have the very best transportation possible, but more and faster service means more double track, more cars, more buses, more employees, and more expense all along the line.
4. We are confident that the one and only way to thus improve the service is to grant the Madison Railways an increased rate of fare.

Proposal for Lengthening New York Subway Platform

The question of lengthening the Interborough subway local station platforms and the desirability of ordering the Interborough Rapid Transit Company to pay half the cost, estimated at about $16,000,000, was discussed by the New York Transit Commission on Dec. 13. Representatives of the company have questioned the interpretation of the commission that the contract requires the company to pay half the cost of improvements and have threatened to appeal to the courts if ordered to pay it.

Denver's Perpetual Franchise Upheld

The United States Court of Appeals has upheld the decision of the lower federal court to the effect that the Denver Tramway, Denver, Col., has a perpetual franchise. The franchise was signed in 1885 and 1886. It stipulates a 5-cent fare, but the fare was changed by the court from 5 cents to 6 cents during the World War. Judge Lewis in the federal court later raised the rate to 8 cents cash with two tokens for 15 cents. This is the fare now in effect.

President Howard S. Robertson says the company is being operated economically, but it is not paying anything like the 7½ per cent allowed by the court. The directors of the tramway, after they receive a full transcript of the Appellate Court's ruling, will meet and then a statement will be made as just what the company proposes to do.

Safety Via Radio and Poster Display in Jacksonville

Features of the safety campaign being conducted by the Jacksonville Traction Company, Jacksonville, Fla., in which all trainmen who operate 80 working days without a chargeable accident will receive turkeys for Christmas, were outlined over WJAX, the Jacksonville municipal broadcasting station, recently by the Rev. James Barbee, pastor of the Riverside Avenue Christian Church. This campaign as an important factor in cutting down the number of accidents was referred to by the Rev. Barbee, Herbert R. MacMillan, chief of the city's fire department, and Lieut. Francis Smith, head of the city's police traffic department, who spoke over WJAX in connection with the safety exhibits at the Florida State Fair and Exposition, sponsored by the Jacksonville Motor Club.

The Jacksonville Traction Company's exhibition at the fair has been favorably received by the local newspapers, which have devoted much space to news stories and photographs of the company's display. The main feature of the railway's exhibit is an impressive poster display. Some of the posters show in picture form the dangers of

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passing from behind one street car onto the tracks of another and depicts other careless moves which have at times caused fatal accidents. A lesson for the operators is also seen in the posters. They will be placed on the street car property after the fair. Other signs ask the co-operation of the public and emphasize the increasing convenience of street car riding.

Stricter Safety Observance Recommended in Indianapolis

A letter has been sent to all electric railways operating in Indianapolis, Ind., signed by Claude M. Worley, Chief of Police, asking a stricter observance of the law requiring street car and interurban conductors to flag railroad crossings before crossing.

Continuation of Railway Service Ordered in Goshen

The well-known "one-horse" town has nothing on the "one-car" town of Goshen, Ind., which narrowly escaped being a "no-car" town recently by action of the Indiana Public Service Commission. In an order issued Dec. 2 the commission ruled that the single street car operated by the Chicago, South Bend & Northern Indiana Railway in Goshen be kept in service despite the fact that the company suffered operating losses last year of about $2,000. The commission ordered the railway to file a schedule for the continued operation and to see that such schedule was "reasonably observed."

A petition asking authority to abandon local service was filed by R. R. Smith, receiver for the railway. Accidents, it was alleged, were responsible for half the loss suffered in 1926. Patrons objected to abandonment.

$20,000,000 for Reading Electrification at Philadelphia

Some of the plans for the electrification of its railroad lines in and about Philadelphia were announced on Dec. 14 by Agnew T. Dice, president of the Reading company. Engineers of the company are actively engaged in completing plans for the electrification of the road from the Reading Terminal to Chestnut Hill, 12 miles from the city. Other improvements are predicted on the completion of this work, and when the Chestnut Hill line is in operation the company anticipates making extensions of electric service to Lansdale, on the Bethlehem branch, and from Glenside to Willow Grove, Pa. The next step will be a continuation to the New York branch, with the first projection of service being made from Jenkintown to Langhorne. The expenditure will be approximately $20,000,000, and the company anticipates embarking on the program within a few months.

Recent Bus Developments

Denial of Railway Petition to Revoke Bus Grant in New York

The Public Service Commission denied on Dec. 13 a petition by the New York State Railways to revoke the certificate issued May 6, 1920, under which the Clark Motor Service now operates over certain streets in Oneida and to Sherrill, N. Y. It further ordered the amendment of that certificate by directing that the bus line operation be limited to certain streets.

It was alleged by the railway that the bus company was unlawfully operating in certain streets in Oneida, not mentioned in its certificate and illegally competing with the railway, thereby violating conditions in the bus certificate.

The consent by the city or the certificate of the commission on May 6, 1920, did not specify a designated route in Oneida, but at the hearing before the Public Service Commission, Second District, on April 10, 1920, evidence was presented on the proposed operation over certain streets in Oneida. The commission further held that there was no evidence of intentional or deliberate violation by the bus company in operating over Oneida streets.

Expansion by Cleveland Southwestern

The certificate and property of the Cleveland-Elyria-Toledo Bus Company has been purchased by the Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, following authorization of the purchase by the Ohio Public Utilities Commission on Dec. 12. With this purchase the Southwestern company immediately announced plans to co-ordinate its railway and bus services and schedules and announced the purchase of four new buses of the latest type and design. With the seven old buses taken over from the Elyria company this will give a de luxe bus service running from Cleveland to Elyria and Oberlin and ending at Norwalk.

Subsidy for Kansas City Bus Line Suggested by Public

The Southeast Improvement Association has promised the Kansas City Public Service Company, Kansas City, Mo., 350 passenger fares daily all winter on a bus line on 43d Street if the line is installed. This is 134 more fares than was reported one day recently on the 39th Street line east of Cleveland, the basis upon which the railway estimated only $14 a day in fares could be expected from a 43d Street line. The 350 fares a day would mean $22.25 a day, figuring 6½ cents a fare, transfers considered.

The association suggests that the stub line from 43d Street to 39th Street on Indiana be cut out and the bus be run to 39th Street, either on Indiana or a paved road adjoining. The stub line cars are said to be overcrowded mornings and nights. More than 500 homes have been counted in the district by the association, with four people to a home.

The Kansas City Public Service Company had estimated 200 homes in this district and fixed the net loss on the line from $7,500 to $10,000 a year.

Another Bus Line Acquired by Baltimore Company

The United Railways & Electric Company, Baltimore, Md., has announced that it has taken over the operation of the Lakeland-Baltimore Highlands bus line and that some new buses will be installed on the line. Other improvements are also contemplated.

Would Run Buses in Supplementary Service in South Bend

The Chicago, South Shore & South Bend Railroad has petitioned the Indiana Public Service Commission for authority to operate bus lines within the city of South Bend to supplement interstate railway service between South Bend and Chicago. According to the petition no additional charges would be made for the extended service.

No Safety—No Bus Between Fall River and Quincy

The Eastern Massachusetts Street Railway, which was recently authorized to operate a bus line between the Fall River Ship Yards and Quincy Center, Quincy, Mass., via South Street, has been notified that the State Department of Public Works will not permit buses to operate as proposed because the streets are too narrow and contain too many curves for safety.

Two Losers in Milwaukee Over Bus Competition

At the request of North Milwaukee officials, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.., is now providing bus service to the western portion of that city, served previously by a competing bus line. The line of the Milwaukee Railway & Light Company, however, connects with the city street cars at a convenient transfer point instead of operating on a parallel route to the downtown business district.

Press reports indicate that the competing bus line, which failed and suspended service, lost heavily from the start. Its routes paralleled those of the

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railway in territory where there is not enough business to sustain duplicated service. The railway company also lost some traffic, but it did not reduce its service.

The Milwaukee company feels that this incident illustrates the folly and unfairness of such competition. It has been without redress in instances of this kind in the past, but the new state law, giving the State Railroad Commission power to pass upon the need of new bus routes, in the interest of the public, is expected to prevent unwise and unnecessary establishment of such routes in the future.

Hearings in New York Continued

The New York Transit Commission on Dec. 13 held another hearing on the application of the Equitable Coach Company for a certificate of convenience and necessity for operation of bus routes in Manhattan, Brooklyn and Queens, for which the Board of Estimate has awarded a franchise. Virtually all of the hearing was devoted to cross-examination by Clarence J. Shearn, of counsel for the Brooklyn-Manhattan Transit Corporation, of Alfred J. Doyle, a Board of Transportation engineer, on the necessity for the routes in Brooklyn.

Court Discusses Highway Legislation

United States Supreme Court, in decision just rendered, finds many unadjudicated questions presented in Hammond bus case. Remands case for further examination

IN A decision handed down Nov. 21 the U. S. Supreme Court points out that many points in the control which a city may possess over its streets remain to be determined. These observations were made in the case of the city of Hammond, petitioner, vs. Schappi Bus Line, Inc. The case arose when the city of Hammond, Ind., with about 60,000 inhabitants, passed an ordinance restricting buses from operating over certain of its streets, or from stopping to receive or discharge passengers on certain other streets without receiving permission from the Board of Public Works. It made an exception, however, of the buses of any companies with which the city had an existing contract. The purpose of the ordinance was declared by the city authorities to prevent congestion of traffic and to promote safety.

The Schappi company, which has been operating interstate buses over some of the streets in question, insisted there was no congestion, even in the business district, except such as resulted at times from the passing of railroad trains at grade and from the allowance of unreasonable parking privileges and that the real purpose of the ordinance was to protect from competition another bus company which came under the exception mentioned in the ordinance.

Case Appealed from District Court

The case was first tried in the District Court, which denied the interlocutory injunction asked. This decree was reversed by the Court of Appeals, which, however, did not give the grounds for its decision.

In its consideration of the case, the Supreme Court finds that "the issues of law are as serious and numerous as the questions of fact." It points out the claims of Schappi that the ordinance is in violation of the Indiana statutes and constitution and that it is also void under the Federal Commerce clause and Fourteenth Amendment. The Supreme Court therefore declared the case remanded to the District Court, as it involved questions which it did not feel like passing upon without a discussion of these points by members of the lower courts familar with the local law. In the meantime it directed an injunction pending the suit.

New Questions Involved

An interesting part of the decision are the remarks of the Supreme Court on the novelty of the questions involved. On this point it says:

The contentions made in the briefs and arguments suggest, among other questions, the following: Where there is congestion of city streets sufficient to justify some limitation of the number of motor vehicles to be operated thereon as common carriers, or some prohibition of stops to load or unload passengers, may the limitation or prohibition be applied to some vehicles used wholly or partly in interstate commerce while, at the same time, vehicles of like character, including many that are engaged solely in local, or intrastate, commerce are not subjected thereto? Is the right in the premises to which interstate carriers would otherwise be entitled, affected by the fact that, prior to the establishment of the interstate lines, the city had granted to a local carrier, by contract or franchise, the unlimited right to use all the streets of the city, and that elimination of the interstate vehicles would put an end to the congestion experienced? May the city's right to limit the number of vehicles, and to prohibit stops to load or unload passengers, be exercised in such a way as to allocate streets on which motor traffic is more profitable exclusively to the local lines and to allocate streets on which the traffic is less profitable to the lines engaged wholly, or partly, in interstate commerce? Is limitation of the number of vehicles, or prohibition of stops to load or unload passengers, of carriers engaged wholly, or partly, in interstate commerce, justifiable, where the congestion could be obviated by denying to private carriers existing parking privileges or by curtailing those so enjoyed? Are the rights of the interstate carrier in the premises dependent, in any respect, upon the dates of the establishment of its lines, as compared with the dates of the establishment of the lines of the local carrier?

These questions have not, so far as appears, been considered by either of the lower courts. The facts essential to their determination have not been found by either court. And the evidence in the record is not of such a character that findings could now be made with confidence. The answer denied many of the material allegations of the bill. The evidence consists of the pleadings and affidavits. The pleadings are confusing. The affidavits are silent as to some facts of legal signifiance; lack definiteness as to some matters; and present serious conflicts on issues of facts that may be decisive. For aught that appears, the lower courts may have differed in their decisions solely because they differed as to conclusions of fact. Before any of the questions suggested, which are both novel and of far reaching importance, are passed upon by this court, the facts essential to their decision should be definitely found by the lower courts upon adequate evidence.

On the same day that this decision was handed down the Supreme Court also passed upon a case of the same city of Hammond vs. Farina Bus Line & Transportation Company. While it declared some of the issues in facts and law were different from those in the Schappi case, it was also remanded to the District Court for further proceedings.

Miami Beach Service Increased

A new bus schedule offering increased facilities has gone into effect at Miami Beach following negotiations with the Miami Beach Railway. Five buses of 21-passenger capacity have replaced the three buses of 28-passenger capacity. The new system now in effect covers an increased mileage, totaling 860 miles a day. Transfers are given to any bus line from the street cars, or from bus to bus. The fare is 10 cents within the city, or from any part of the city to Miami.

Approval of Taxi Purchase Terms Sought

The Philadelphia Rapid Transit Company, Philadelphia, Pa., filed application on Dec. 6 with the Public Service Commission in Harrisburg for the acquisition of the Diamond Cab Company and the Cunningham Cab Company. According to the petition the P. R. T. desires to buy 410 shares of stock of the Diamond company and 750 shares of the Cunningham company for $250,000. The P. R. T. already owns the Yellow Cab Company. Brief reference to the plan of the P. R. T. to acquire these properties was made in the Electric Railway Journal issue of Dec. 10, 1927. In support of its petition, the P.R.T. argued that the absorption of the two independent companies by the Yellow Cab Company, now under operation of Mitten Management, Inc., would enable the railway to reduce cruising, thus relieving city-center traffic congestion. The gross earnings of the Cunningham Cab Company were estimated at $200,000 for the first ten months of this year by P.R.T. auditors.

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Financial and Corporate

Purchase Overtures Resumed

Special counsel for New York Transit Commission says renewal of purchase negotiations with B.-M. T. delays unification plan

RESUMPTION of negotiations with officials of the Brooklyn-Manhattan Transit Corporation for the purchase by the city of the company's elevated lines and its lease and interest in the city-owned subway system is given by Samuel Untermyer, special counsel to the Transit Commission, as the reason for his delay in submitting the unification plan, based on his report of recommendation of Sept. 30 to the commission.

Mr. Untermyer, in a statement made on Dec. 12, disclosed that the company now has experts making a valuation of its properties and on completion of their work the city will know just what the owners of the B.-M.T. will ask for their subway and elevated lines. It is understood, although Mr. Untermyer did not say so, that the company has abandoned its insistence that the city should buy its surface lines.

Mr. Untermyer's statement was in response to repeated inquiries as to how soon submission of the unification plan might be expected. He said:

Owing to the many and complicated questions involved we are still far from a conclusion. What will be the outcome no one can predict. The pivotal point will be, of course, that of the value and selling price of the elevated property.

The Transit Commission's physical valuations have long been in the possession of the companies. We have not received theirs, but physical values are not the ultimate criterion nor the most important element in the problem.

The B.-M. T. has for some time past had its experts at work. Very soon after they have completed their studies we shall know how much these gentlemen will expect for their elevated property. Meantime there are many other aspects equally important which are being and must be further considered.

PROGRESS NOT SLOW

I realize that progress during the past weeks has seemed slow to the outsider, but that is not the fact. We must ask the public to be patient. It may be that it will all come to naught. I can only say that the outlook is more encouraging.

It would be manifestly undesirable and unwise to put out a plan based on prices fixed by the commission and opposed by the companies with the alternate of recapture so long as there is any hope of avoiding that impass. If these negotiations fail or are too long protracted without making decisive progress, the plan will be put before the commission without further delay.

Later Mr. Untermyer reiterated that recapture would not result in the disruption of the Brooklyn rapid transit service. He said there could be joint operation of recaptured and recapturable lines by order of the commission. Mr. Untermyer added that the only threat to the maintenance of the 5-cent fare was through the inclusion in the readjustment plan of the elevated lines, which he said were losing money, but that it might be well for the city to buy them out of deference to popular opinion. He said:

My judgment that the best interests of the city would be served by recapture and the exclusion of the elevated lines, unless they can be acquired on very moderate terms, is not in the least altered by recent events, I repeat that this can be accomplished without the slightest inconvenience to the traveling public and without a double or increased fare, and that the car riders will in that way secure a vastly improved service and a longer haul.

The only threat to the maintenance of the 5-cent fare is from the inclusion of the elevated lines, both of which are now losing money and would be a still heavier drain if acquired at anything like the inflated prices that have been mentioned. The total cost of both lines on recapture, including all subway equipment, would be about $180,000,000. It would cost more than twice that sum to purchase them.

$18,000,000 Minnesota Issue Approved

The Minnesota Railroad and Warehouse Commission has approved the issue by the Minneapolis Street Railway and the St. Paul City Railway through the parent corporation, the Twin City Rapid Transit Company, of $18,000,000 of 5½ per cent lien and refunding gold bonds, series A, dated Sept. 1, 1927, and maturing in 25 years. The proceeds will refund obligations maturing Aug. 15 and Oct. 1, 1928, to a total of $15,000,000, with capital additions for improvements and extensions. The bonds were offered publicly during the week ended Dec. 10 subject to the approval of their terms by the commission.

$188,016,892 Boston "L" Reproduction Cost

Transportation value of the property fixed by state body at $118,837,253. Governor believes public control without public ownership to be ideal arrangement

BY A unanimous vote the Massachusetts Department of Public Utilities places the reproduction cost of the Boston Elevated Railway at $188,016,892, the transportation value at $118,837,253 and the book value at $109,103,445.

Right-of-way has a book value of $11,435,768 and a reproduction cost of $20,724,294. The largest single item are the cars and buses, with a book value of $16,325,134 and given a reproduction value of $22,761,311, but for transportation purposes, or carrying capacity, the value is fixed at only $14,569,190. Power plant equipment has a book value of $9,099,531 and a reproduction value of $11,434,666, but for transportation purposes this is estimated at only $4,498,342. The book value is the capital stock, bonds and premiums. This is found to be some $9,500,000 less than the transportation value.

The report was ordered by the Legislature. It was made public on Dec. 8 at noon. The document covers four questions:

1. The value for transportation purposes of the property of said company, and whether this value is more or less than the option price provided in Sec. 16 of Chapter 159 of the special acts of 1918.

2. Whether the value of said property for transportation purposes has been increased during the period of public control through expenditures from car fares and other revenue for maintenance, depreciation, reserves or otherwise, and if so, how much.

3. As to the reproduction value of the property of said company and to report its opinion as to the amount thereof, less a proper deduction for depreciation and obsolescence.

4. State its opinion as to the value of the surface lines abandoned by said company.

It has been pointed out that the important figure in the valuation of Boston Elevated property is the reproduction cost, less depreciation, which is $128,937,869. The department finds that to reproduce the road new would cost $188,016,892, but the road is not new so that depreciation of $59,079,023 is deducted to reflect wear and tear of property and equipment, etc. Stress is laid by one of the commentators as the fact that reproduction cost is a matter of only academic interest inasmuch as the state has an option to buy the road at a lower figure. However, it is of some value to the stockholders to know that their property, which is carried on the books at $109,000,000, would cost approximately $129,000,000 to reproduce. In fact, as the road carries a depreciation reserve of about $8,200,000, the excess appraised value is not $20,000,000 but $28,200,000.

It was provided in the public control act that the Commonwealth might buy the Elevated road for a price which, although not stated in the act, is found by the Department of Public Utilities to be a little more than $109,000,000. Assuming that the holders of the first and second preferred stocks exercised their right of conversion into common, and that the $3,000,000 so-called third preferred was called at 105, this price would work out about $111 a share for

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the common. Consequently, as the state can buy the road at a figure which would give the common stockholders $111 a share, it makes no particular difference how much more than book figures the property may be found to be worth except of course in the unlikely contingency of return to private management. In that event the value of the property becomes all-important.

On Dec. 31, 1926, according to the Boston Elevated balance sheet, the book value of the $23,879,400 common stock was about $119 a share. This is after allowing par for the first and second preferred stocks which they would receive in liquidation unless converted into common, and is also after taking out $105 a share, the redemption price of the $3,000,000 so-called third preferred. The reproduction cost being $20,000,000 larger than the gross amount at which the road carries its property on its books, and $28,200,000 larger than the net amount, after depreciation, it follows that the book value is increased in the first instance to $202 a share and in the second instance to $237 a share. In other words, if the road were to substitute this $129,000,000 reproduction cost for its own valuation of $109,000,000, less $8,200,000 depreciation, the result would be a book value of $237 a share for the common. As already indicated, however, these calculations are essentially academic with the state holding an option to buy the property for $109,000,000.

Governor Fuller has made known that he is opposed to any plan for the exercise of the right of the state to take over the road. He believes the situation is one which gives the state a distinct advantage, but that the solution of the Elevated problem is in a continuance of public control, without public ownership, to which there are "good and valid objections." He will not recommend any specific bill to the General Court, but he will submit suggestions which he believes will go far toward settling the problem. On Dec. 8 he stated his opposition to any plan which would mean the return of the road to the control of its private owners, or which, on the other hand, would bring about public ownership. He said:

I believe that in the public control of the road, without the objections of public ownership, we have the ideal situation, and if a plan is devised whereby the road can be relieved of some of the burdens which have been placed upon it, there is no reason why this situation cannot be continued, with equal justice to the stockholders and to the public.

The Governor would not say for what period of years he would favor the continuance of public control, but indicated that it might be left to run indefinitely without any fixed period being specified. He said he would be slow in proposing any long period of continuance because the future must always be uncertain. As to the rate of dividends which should be continued to stockholders, the Governor was noncommittal, but he said he believed the dividend question could be worked out satisfactorily to both stockholders and the public.

On April 26, 1927, the Massachusetts House ordered that as an aid in determining the disposition to be made of the Boston Elevated Railway and its property, including the question of extending or terminating public control, the Department of Public Utilities be directed to investigate the value for transportation purposes of the property of the company, and whether this value was more or less than the option price provided in Section 16 of Chapter 159 of the special acts of 1918, and also whether the value of the property for transportation purposes has been increased during the period of public control through expenditures from carfares and other revenue for maintenance, depreciation reserves or otherwise, and if so, how much. The department was also directed to investigate as to the reproduction value of the property of the company and to report its opinion as to the amount thereof, less a proper deduction for depreciation and obsolescence. It was also to state its opinion as to the value of the surface lines abandoned by the company.

Changes in Kansas City Board of Directors

J. K. Newman, large owner of the stock of the Kansas City Public Service Company, Kansas City, Mo., resigned Dec. 5 as a member of the board of directors at the first formal meeting of that body. His resignation is in line with his plan to place the street railway properties there under a local board of directors. His place will be filled by George G. Morris, trainman, who has been selected for the place by a vote of all the employees of the company.

The board is now composed of Peter W. Goebel, chairman; Herbert M. Woolf, James K. Chandler, Powell C. Groner, president; Carl W. Allendoerfer; Henry N. Ess; Charles Howell, Dr. Paul H. Saunders, E. M. Stayton; Henry Hanssen, Mr. Morris. Dr. Saunders is the only out-of-Kansas City member, his home being in New Orleans. He is a member of the Newman-Saunders banking firm. A budget for the coming year was placed before the board by Mr. Groner. It called for expenditures of about $3,000,000 next year.

Dissolution of Vancouver, Wash., Company Asked

A petition for an order permitting the Clark County Development Company, Vancouver, Wash., to dissolve the corporation, which was organized June 19, 1909, was filed in that city Dec. 2. This corporation operated the Vancouver street and interurban railway up to Nov. 1, 1926, when this railway was abandoned by the City Council. Thus since that time the organization has had no business to pursue. The territory in which the railway operated is now served by the Vancouver Bus Company.

Warsaw Line Would Issue Bonds

The Winona Railroad, operating between Peru and Goshen, Ind., has petitioned the Public Service Commission for authority to issue $260,000 in 6 per cent bonds. This money is desired to reimburse the company for capital expenditures since June, 1924.

Reasons for California Deal Explained

Further facts are available regarding the negotiations for the sale of the Petaluma & Santa Rosa Railroad, Petaluma, Cal., to the Southern Pacific and the Santa Fe Railroads acting jointly, to which brief reference was made in the ELECTRIC RAILWAY JOURNAL for Dec. 3, page 1042. While the companies mentioned own the Northwestern Pacific Railroad, the purchase of the Petaluma & Santa Rosa Railroad by them will not mean consolidation of the two lines, as they will continue to be operated independently. There will be no change in the management or policy of the Petaluma & Santa Rosa Railroad.

An officer of the electric railway in explaining the proposed deal made it plain to the public that the sale will simply mean a change in stock ownership, which will enable the electric railway to expand its business. It now serves, under traffic arrangements, as a feeder to both the Southern Pacific and the Santa Fe lines, and purchase by these companies will have the effect of extending these arrangements, placing them on a more permanent basis whereby more traffic can be developed.

Port Arthur Sale Date Set

Sale of the electric railway system of the Port Arthur Traction Company, Port Arthur, Tex., has been ordered by Judge W. Lee Estes of the United States District Court at Beaumont, upon petition of the Dayton Savings & Trust Company of Dayton, Ohio, for foreclosure of mortgage against the company. The date has been set for Jan. 10.

Suit for the foreclosure of mortgages amounting to $324,000 and asking the sale of the public utility was filed in the United States District Court Nov. 14. According to the petition the railway is "deteriorating so fast that it ceased to be a safe investment for its creditors."

In April, 1917, the officers of the Port Arthur Traction Company issued $400,000 in bonds for improvements and extensions and for operation and maintenance. The plaintiff alleged that only $9,000 of the original issue has been paid off and that three semi-annual allotments of interest have lapsed. In July, 1926; in January, 1927, and in July, 1927, the defendant failed to pay $8,100 interest for the semi-annual period, it is alleged. The outstanding bonds are the only indebtedness secured by lien against the company.

It is understood that the Gulf States Utility Company will enter a bid when the railway is offered at public auction.

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Earnings in Youngstown Less Than Allowed Return

Including the 7 per cent return allowed on the capital investment, the Youngstown Municipal Railway, Youngstown, Ohio, operated during October at a loss of $32,505 according to Traction Commissioner Harry Engle.

This is the fourth consecutive month that the company received no return on its investment. The loss, however, is smaller than in September, when it was $37,748. The deficit for August was $27,280 and for July $27,203. Under the franchise the company was entitled to a return of $26,726.

Gross revenue for October, this year, was $158,346, compared with $176,924 for the corresponding month last year. The total mileage, including bus and railway, for October, 1927, was 477,-301, compared with 483,085 for the similar month of last year. Mr. Engle's report places the total deficit in the stabilizing fund at the end of the month at $1,647,667. The earnings per car-mile are given at 32 cents and the actual cost of service at 38 cents.

1 Per Cent Bonus on Ottawa Traction Stock

The Ottawa Traction Company, Ottawa, Ont., has declared a bonus of 1 per cent on the capital stock in addition to the regular quarterly dividend of 1 per cent, both payable on Jan. 3 to stock of record Dec. 15.

Binghamton Sale Postponed

Sale of the properties of the Binghamton Railway, Binghamton, N. Y., under foreclosure set for Dec. 1, 1927, was postponed to Jan. 5, 1928. The railroad proper consists of 47.72 miles of single and double track and the equipment consists of seventeen buses and 79 cars, all in good condition.

Abandonment Sought in New Mexico

A petition was recently presented to the New Mexico Corporation Commission by the Las Vegas Transit Company seeking permission to abandon the line because of operating losses. The line operates between east and west Las Vegas, N. M The two municipalities have already approved the proposed suspension.

Pence Interests Get Minnesota Roads

H. E. Pence, president of the Minneapolis, Northfield & Southern Railway, Minneapolis, Minn., has secured control of the Minnesota Western and the Electric Short Line Terminal Company. The assets of the companies involved are put at $4,000,000. The companies will be operated separately under the management of the Minneapolis Southern. This gives the Pence line a fine electric terminal in the city, which is entered also by the Anoka electric line. The first two named roads operate gas-electric passenger trains and steam freight. They both enter the electric terminal at Third Avenue North and Seventh Street. The first line covers 127 miles and the second 116 miles to Gluek, Minn., a new station.

Verity of Commission's Valuation Not Considered in O'Fallon Case

A court specially constituted to try the issues has sustained the ruling of the Interstate Commerce Commission in the so-called St. Louis & O'Fallon Railroad recapture case. The Supreme Court of the United States will hear the appeal. The importance of the final result of the litigation may be judged by the finding of the commission that the 1914 base, which was the one the commission with certain allowances adopted by a majority opinion, gave in 1920 a value of $18,900,000,000 for all railroad properties in the United States, while the reproduction cost basis made it $41,400,000,000 in 1920 and took it back to $31,300,000,000 in 1923.

In his decision, Federal Judge Kimbrough Stone says the order of the Interstate Commerce Commission should be modified to allow interest on each of the amounts due found by the court only from June 17, 1927, and as thus modified should be sustained.

The concurrent opinion, written by District Judge Charles B. Faris, says:

In conclusion, I am not convinced that the commission erred, but am of the opinion that it reached the valuation found by it in the only way possible in a situation so difficult as that absolute certainty and correctness were well nigh finitely impossible. Therefore I concur in the result.

Judge Stone in his opinion did not touch upon the question of valuation, but Judge Faris in his opinion said:

Therefore the value of the physical property of the common carriers under the recapture provision of the interstate commerce act ought to be the result of expert opinion, reasonably and honestly exercised and informed by a consideration of the information required by statute to be obtained; as is to be deduced from a fair analysis of the items considered and of the method employed in the valuation; and should, in addition to the use in the valuation of the statutory information, take into consideration the average of known price levels for both labor and materials over a fair term of years preceding the valuation as well as for a fair term of years thereafter, based on the trend of such levels according to historical observation and human experience.

The original opinion was written by Judge Stone and the concurring opinion was prepared by Judge Faris.

In the St. Louis & O'Fallon Railroad case the commission was divided five to four. The language of the dissenters was more bitter than the protest of the railroads. Commissioner Thomas F. Woodlock of New York declared that the law of the land was summarily set aside by the majority. The Supreme Court is composed now as it was when it decided the case of McCardle vs. Indianapolis Water Company. The essence of that decision was that value should be found as at the time of the inquiry.

The opinion of the Interstate Commerce Commission on entering its decision said:

We are dealing here with one small railroad. Nevertheless, what we do in this case we must in principle do for all the railroads in the United States. Whatever our decision, its effects in dollars and cents is relatively unimportant in this particular case. There is here presented, in reality, a great national problem affecting public policy and welfare in a most profound way . . . We must carefully review the significance to the nation of the decision which we make in this case in its bearing on the relation between all railroads and the people of the United States. It may well be that the valuation of railroads on a national scale requires the beginning of a new chapter in valuation.

Vote on Increase in P. R. T. Preferred Stock Scheduled

A special meeting of the stockholders of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will be held on Feb. 6 to vote on the proposed increase of $7,000,000 in preferred stock, which will make $30,000,000 preferred outstanding.

Committee Representing Omaha Holders Reviews Affairs

Affairs of the Omaha & Council Bluffs Street Railway, Omaha, Neb., have been reviewed in part as follows in a circular by the protective committee of bondholders:

As a result of careful and impartial study of the situation, the following effective measures have been or are being taken for the protection of the bondholders, viz., John N. Shannahan, an experienced railway operator, was made president of the company; (2) the financing of the Omaha & Council Bluffs Railway & Bridge Company, thus preserving the equity in this company for the benefit of the railroad company bondholders; (3) the election of representative business men of Omaha to the board; (4) agreement with the company providing (a) that no dividend shall be paid during the period of extension and (b) for the cancellation or deposit as security of the $1,005,000 bonds now held in the treasury of the company, and (5) to insure the maintenance in office of a satisfactory board of directors during the period of extension.

It is our belief that the above features greatly strengthen the position of the bondholders and that their interests will be fully and adequately protected by the committee, of which Sidney W. Noyes is chairman. We believe the proposed extension of the bonds is the only practical course for the bondholders and we therefore strongly recommend that you deposit your bonds immediately. In view of the measures adopted for the protection of bondholders, our committee will now disband and representatives of our committee will accept membership on the committee requesting deposits.

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Personal Items

J. F. Lumsden New Manager of Nova Scotia Property

On the first day of the new year J. F. Lumsden will take over the management of the Nova Scotia Tramways & Power Company, Halifax, N. S. To carry out this assignment he will resign as assistant chief engineer of the Nova Scotia Power Commission, with which body he became affiliated in 1921 as chief electrical engineer.

Mr. Lumsden was first employed with the Canadian General Electric Company as an apprentice in its factory and on its engineering staff from 1911 to 1915. Early in the latter year and up to July, 1916, he served on the operating staff of the Winnipeg Electric Railway. After his overseas service with Canadian Expeditionary Forces he returned to Halifax in 1919 and took a position as professor in electrical engineering at the Nova Scotia Technical College. Two years later he went with the Nova Scotia Power Commission.

The manager-elect was born in Trinity, Newfoundland. Early in his life he moved to Nova Scotia, where he attended the high school in Yarmouth and later the Mount Allison University and the Nova Scotia Technical College. He was graduated from the latter institution with the degree of bachelor of science in electrical engineering in 1911.

W. J. Tharp Retires from Railway Work

W. J. Tharp, affiliated with the electric railway properties in Little Rock, Ark., for more than 28 years, resigned recently to become an official of Kaufman & Baer, a large department store organization in Pittsburgh. For many years Mr. Tharp was a director of the Arkansas Central Power Company and secretary of the Arkansas Utilities Association. He also served on utility association special committees. When Mr. Tharp became affiliated with the Little Rock property the system owned twelve cars and the mileage was about half what it is today. At present there are 65 cars in regular service running over 42 miles of track.

M. N. Baker Honored

M. N. Baker, associate editor of *Engineering News-Record,* was the guest of honor at a dinner given by about 100 of his associates in the McGraw-Hill company at the Engineers Club, New York City, Dec. 9, in celebration of his 40th year of continuous editorial service with *Engineering News* and *Engineering News-Record.*

Mr. Baker started in engineering journalism with *Engineering News* when Arthur M. Wellington was editor. One of his first achievements was the building up of a water-works year book, the Manual of American Water-Works, which long was a basic source of information regarding the water-works of the United States and Canada. Out of this year book grew Mr. Baker's special and editorial attention to questions of water purification, sewage and garbage disposal and other phases of public health and sanitation which were then beginning to be put on a scientific basis. He is the author of several standard engineering works.

H. L. Mitchell Honored

H. L. Mitchell, president of the West Penn Railways, Pittsburgh, Pa., was chosen to continue as president of the Pennsylvania Street Railway Association at the close of the session on Dec. 2, in Scranton, Pa. He succeeds the late Jilson J. Coleman.

H. L. Mitchell

This railway executive has been identified with the West Penn Railways and the companies which it controls for the past 25 years. During this time the property has developed into one of the most important utility systems in Pennsylvania operating railway and bus lines in the western part of that state, eastern Ohio and northern West Virginia.

Mr. Mitchell entered the employ of the old Pittsburgh, McKeesport & Connellsville Railway at Pittsburgh on March 1, 1902. Less than a year later, when the general offices of the road were moved to Connellsville, he became chief clerk to Thomas Elliot, at that time general manager. From that time until July 1, 1911, he held various positions with the company, among them those of paymaster and office manager. He also had charge of the general and district stores department.

When the West Penn System acquired additional property in Allegheny, Buffalo, Armstrong, Washington and Green Counties Mr. Mitchell was transferred to Pittsburgh as assistant to W. E. Moore, vice-president and general manager. Several years later, when the system was reorganized, he was made assistant manager of the light and power department, and in 1918 he entered the office of Williston Fish as an assistant to the vice-president. A few months later he was transferred to the Wheeling Traction Company, and on Feb. 1, 1919, returned to Pittsburgh as general manager of the West Penn Railways. Nor were his honors to stop with this promotion. He was elected vice-president on March 1, 1920, and president April 14, 1927.

Engineer Hewes Resigns from Rensselaer Property

James E. Hewes, vice-president and general manager of the Eastern New York Utilities Company, Rensselaer, N. Y., will resign Jan. 1 to specialize in the investigation of the engineering and operation of public utilities. Mr. Hewes, widely known as an engineering expert, went to the Albany Southern Railroad in 1909 in an advisory capacity soon after that company was brought out of receivership. He was appointed vice-president and general manager thirteen years ago and since that time has been the directing head of the railroad, the gas and the electric departments of the company.

In 1922 the company was succeeded by the Eastern New York Utilities Company and Mr. Hewes remained the active head of the company. Prior to his going to Albany, he was for five years assistant to the vice-president in charge of operations for H. M. Byllesby & Company, Chicago, operators and owners of public utilities. The property which Mr. Hewes leaves was merged recently with the newly formed New York Power & Light Corporation.

Because he had seen an opportunity to broaden his field of activity was the reason given by Mr. Hewes for his resignation. He plans to enter his new work when he returns from a month's vacation in Cuba.

W. H. Munro has resigned as manager of the Nova Scotia Tramways & Power Company, Halifax, Nova Scotia. He will be succeeded by J. F. Lumsden.

Charles A. Brann has resigned as superintendent of the Eastern Texas Electric Company, Beaumont, Tex. He will be located at Navasota, Tex., in charge of properties in more than a score of communities in which the Western Public Service Company operates.

J. McLucius Snellings was made general freight agent of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., effective Sept. 1, 1927. Mr. Snellings became affiliated with the corporation as a conductor on the City Division, July, 1915, and on Oct. 1, 1916, was promoted to assistant claim agent and chief clerk of the railway department. He was given the additional duties of chief dispatcher on Feb. 18, 1924. He was also secretary of the safety organization.

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Manufactures and the Markets

Twelve New Cars for Washington Railway

Twelve new cars, at an estimated cost of more than $174,600, have been ordered by the Washington Railway & Electric Company, Washington, D. C., from the J. G. Brill Company, according to recent advices from the company. In addition the company is equipping 41 double-truck, one-man cars with National Pneumatic Company's automatic rear exit doors and brake interlocks. With this interlocking equipment brakes cannot be released and current cannot be applied to the motors until the rear exit door and step are closed. As the cars go through the shop they are being painted royal blue and cream, with gilt lettering on the outside, and on the inside the woodwork is being painted with a light gray enamel and the headlining with white enamel. The estimated cost of this work is a little more than $47,000.

The order for the new cars and the changes in others were the outcome of an order issued by the Public Utilities Commission of the District of Columbia Sept. 8, 1927, in which it was stated that "the commission is of the opinion that as a general principle one-man cars not equipped with automatic treadle rear exits and double front doors, to permit of simultaneous entrance and exit, do not and cannot give satisfactory service for the city of Washington, D. C."

In accordance with this opinion the company agreed to equip the 41 one-man cars with automatic treadle rear exits and double front doors. At the same time it also agreed to retire from service twelve of the oldest type of one-man cars not capable of being so equipped and to replace them with an equal number of new cars of the type now in use on Wisconsin Avenue.

Let-Up in Demand Affects Metal Prices

Copper and zinc have been extremely quiet in the week ended Dec. 14. There has been some activity in lead, but the total volume of business has declined. Tin has been in fair demand.

The week ended Dec. 14 has been one of the quietest of the year so far as copper is concerned. Most of the larger producers have held throughout the week at 14⅛ cents delivered in the East and 14¼ cents in the Middle West. Copper appeared on the market as early as Saturday, however, at 14 cents delivered in the East. Foreign demand has been quiet, with the export association's price unchanged at 14.50 cents, c.i.f.

Zinc prices have gradually weakened from the level of a week ago, the net decline for the week being about ⅛ cent. Sales have been very small. On Dec. 13 and 14 the market was 5.70 cents, St. Louis, for December and 5.725 cents for January and February, though several producers refused to quote at these levels.

Lead buying has been in considerably smaller volume than during the preceding week, but aside from some slight tendency in the Middle West to shade prices in order to attract buyers, quotations are unchanged. The lead available at 6.325 cents or even 6.30 cents in the St. Louis market is for the most part for December delivery, the January position being the firmer of the two.

Consumers have been buying tin in the domestic market more actively than for several weeks, and the price has ruled close to 58.625 cents for prompt Straits, with little or no difference for forward positions.

Railway Traffic Accommodated Over Akron Viaduct

The new Exchange Street viaduct in Akron, Ohio, costing approximately $2,000,000, has been opened for railway traffic. The viaduct will not be ready for general use by the public until early next year. It spans all of the trunk line railroads entering the city and is adjacent to the site of the new Union Station, which is to be started in 1928 and built at a cost of approximately $4,000,000. The companies constructing the viaduct are the Northern Ohio Power & Light Company, Baltimore & Ohio Railroad, Erie Railroad and Pennsylvania Railroad. The city also pays its proportion. This viaduct, it is reported, is the first step in the complete grade elimination program in the city.

Queens Subway Contract Awarded

The first contract in the Borough of Queens for the construction of part of New York City's new subway system was awarded on Dec. 13 by the Board of Transportation to the Atwell-Custon-Morris Company at the bid price of $5,198,283, the lowest of twenty bids received. The contract is for a section 1 mile long. Its construction will serve to connect the Queens Boulevard-Jamaica subway and the Brooklyn crosstown subway, still to be built, with the 53d Street tunnel line from Manhattan. Completion of the section is stipulated within three years from the date of delivery of the contract. This is the 33d major contract of the new subway system to be awarded and brings the total awards to $171,595,561.

The board will receive bids for the construction of two more sections of the Brooklyn crosstown subway this month. On Dec. 30 it will receive bids for the section in Manhattan Avenue from Nassau Avenue to Green Street, and on Dec. 31 for the section in Greenpoint to Arch Street, Long Island City.

Carhouse of Ohio Road Burned

Fire of undetermined origin destroyed the carhouse of the Columbus, Delaware & Marion Electric Company at Stratford, 3 miles south of Delaware, Ohio, on Dec. 15, the loss being estimated at several hundred thousand dollars.

ELECTRIC RAILWAY MATERIAL PRICES—DEC. 13, 1927

Metals—New York

Copper, electrolytic, cents per lb	13.850
Lead, cents per lb	6.50
Nickel, cents per lb	35.00
Zinc, cents per lb	6.0625
Tin, Straits, cents per lb	58.625
Aluminum, 98 or 99 per cent, cents per lb	25.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	61.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.075
Somerset mine run, Boston	1.90
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	1.60
Central, Ill., screenings, Chicago	1.50
Kansas screenings, Kansas City	2.175

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.25
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.80
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.45

Hardware—Pittsburgh

Wire nails, base per keg	2.50
Sheet iron (24 gage), cents per lb	2.75
Sheet iron, galvanized (24 gage), cents per lb.	3.60
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	2.40

Waste—New York

Waste, wool, cents per lb	16–20
Waste, cotton (100 lb. bale), cents per lb.:	
White	16–19.50
Colored	11–16

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.6
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal	$0.59
Putty, 100 lb. tins, cents per lb	5.25–5.50

Wire—New York

Copper wire, cents per lb	15.125
Rubber-covered wire, No. 14, per 1,000 ft.	5.50
Weatherproof wire base, cents per lb	15.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd	1.85
Cement, Chicago consumers' net prices, without bags	2.05
Gravel, ¾-in., cu.yd., f.o.b. N. Y	1.75
Sand, cu.yd., f.o.b. N. Y	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb	11.375
Light copper, cents per lb	9.875
Heavy yellow brass, cents per lb	7.375
Zinc, old scrap, cents per lb	3.625
Lead, cents per lb. (heavy)	5.375
Steel car axles, Chicago, net ton	$15.75
Cast iron car wheels, Chicago, gross ton	13.75
Rails (short), Chicago, gross ton	14.75
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.75

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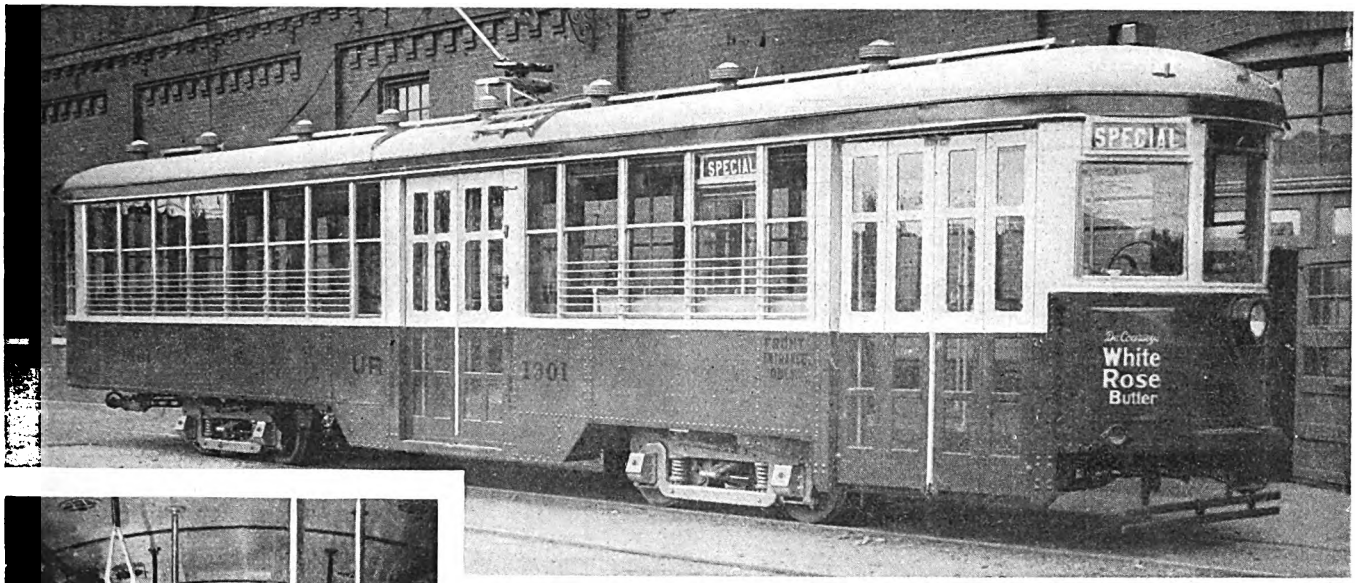
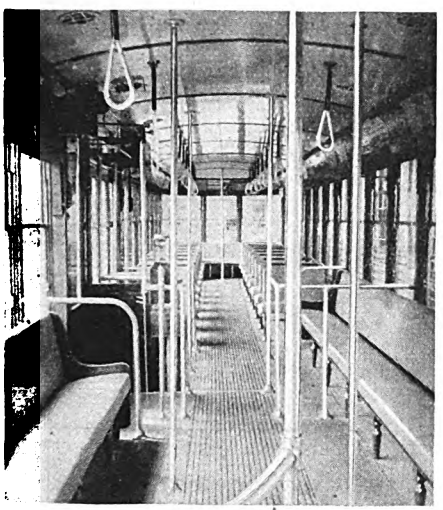
First Home-Built Car Exhibited by St. Louis Railway



Side elevation of the 50 St. Louis units. They are of the front-entrance, side-exit type and are adaptable to one-man operation



Rear view of interior of the 50 new units which are now being turned out from a shop of the Public Service Company of St. Louis

CAR No. 1301, the first of 50 new units now being built by the St. Louis Public Service Company of St. Louis, Mo., at a cost of $10,500 each, was placed on public exhibition at Twelfth Boulevard and Olive Street recently. The units are to be of the front-entrance side-exit type which originated with car No. 700.

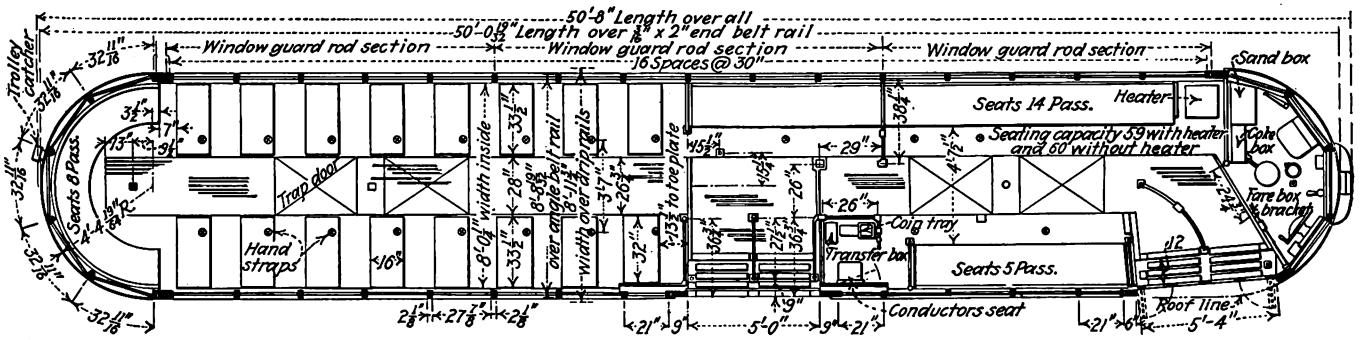
Among other things the specifications call for a slight incline to the floor from the front entrance to the conductor's stand; narrower grooves in the flooring to obviate the danger to high heeled feminine passengers; elimination of screen behind the motorman's stool to increase vision and ventilation; readily adjustable window sashes of metal and better door signal lights for the motorman. The seat upholstery is of cane.

The orange coloring so familiar to street car riders of St. Louis, but of a shade darker than now in use, has been chosen for the lower portions of the units, while the upper sections are finished in a rich cream color. The inside painting will consist of cream ceilings that reflect the light and contrasts effectively with the interior cherry trim.

Following are specifications released by R. J. Lockwood, assistant manager of the company:

SPECIFICATIONS OF ST. LOUIS' HOME-BUILT CAR

Name of railway	St. Louis Public Service Co.
City and state	St. Louis, Mo.
Number of units	50
Type of unit	One-man, two-man, motor, passenger, city, single-end, double-truck
Number of seats	60
Builder of car body	United Rwys. of St. Louis
City and state	St. Louis, Mo.
Delivery	15 per month
Weights:	
Car body	20,986 lb.
Trucks	10,414 lb.
Equipment	8,000 lb.
Total	39,400 lb.
Bolster centers	24 ft. 6 in.
Length over all	50 ft. 8 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 11¼ in.
Height, rail to trolley base	11 ft. 11 in.
Window post spacing	30 in.
Body	Semi-steel
Roof	Arch
Air brakes	Westinghouse variable load straight air
Armature bearings	Plain
Axles	3¼ x 7 M.C.B. journal
Car signal system	Faraday
Compressors	Westinghouse D.H-16
Conduit	Metal
Control	K-75
Curtain fixtures	Curtain Supply Co.
Curtain material	Wyndasote
Destination signs	Hunter
Door mechanism	National Pneumatic Co.
Doors	Folding front, sliding center
Energy-saving device	Economy
Fare boxes	Johnson
Gears and pinions	Westinghouse spur
Glass	D.S.B.
Hand brakes	Peacock
Hand straps	Central Equipment Co.
Heaters	Peter Smith hot air
Headlights	Imperial incandescent, Crouse-Hinds
Headlining	Agasote, Pantasote Co.
Interior trim	Cherry
Journal bearings	Plain, 3¼ in. x 7 in.
Journal boxes	A.E.R.A. type with thrust plate
Lamp fixtures	General Electric
Motors	Westinghouse No. 510-E, inside hung
Painting scheme	Orange, chrome and cream enamel
Registers	Security
Roof material	Treated canvas
Sash fixtures	O. M. Edwards Co.
Seats	St. Louis Car Co.
Seat spacing	30 in.
Seating material	Cane
Steps	Stationary
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	Nuttall U. S. No. 20-A
Trolley wheels	Railway
Trucks	Commonwealth Steel Co.
Ventilators	Globe
Wheels, type	Chilled iron, 26 in. diameter
Wheelguards or fenders	Company make



General dimensions and seating plan of 50 units for Public Service Company of St. Louis

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Receiver Named for the Galena-Signal Oil of Texas

On the application of the Galena-Signal Oil Company, Franklin, Pa., Judge Monteith in the 61st District Court appointed McDonald Meachum of Houston, Tex., receiver Dec. 8 of the Galena-Signal Oil Company of Texas, whose refinery and principal properties are in Houston. The Houston company is a subsidiary of the Pennsylvania company. The Fidelity Trust Company, Houston, is made a party to the suit because it is the trustee for the bondholders. M. J. A. Bertin, president of the Pennsylvania company, said the action had been rendered necessary by the depressed state of the oil business throughout the country. He stated that "although the Galena-Signal Oil Company of Pennsylvania, through ownership of capital stock of the Galena-Signal Oil Company of Texas, has a considerable investment in the latter company, the operations of the two companies has been along distinctly different lines and the receivership in no way affects the operating program of the Pennsylvania company, which will continue, as in the past, along lines of specialization in the field of railway transportation and mechanical lubrication."

Twenty Rapid Transit Cars for Hudson & Manhattan

Specifications have been released for the twenty rapid transit motor cars ordered on Nov. 17 by the Hudson & Manhattan Railroad, New York, from the American Car & Foundry Company, New York, and which were mentioned in the issue of the JOURNAL for Dec. 3. The cars will have an over-all length of 51 ft., total weight of 74,000 lb., a seating capacity for 44 passengers, and will be of all-steel construction. The exterior color of the cars will be Pullman green. Specifications released by T. G. Anthony, assistant to president Hudson & Manhattan Railroad, follow:

Name of railway	Hudson & Manhattan Railroad
City and State	New York, N. Y.
Number of units	20
Type of car	Multiple unit, motor, passenger, interurban, double-end, double-truck
Number of seats	44
Builder of car body	American Car & Foundry Co., New York City
Date of order	Nov. 17, 1927
Weights:	
Car body	35,100 lb.
Trucks	24,340 lb.
Equipment	14,560 lb.
Total	74,000 lb.
Bolster centers	33 ft. 0 in.
Length over all	51 ft. 0 in.
Truck wheelbase	6 ft. 6 in.
Width over all	8 ft. 11 in.
Height, rail to trolley base	11 ft. 9 in.
Body	All steel
Roof	Monitor
Doors	Center and end
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Heat treated
Car signal system	National Pneumatic
Compressors	Westinghouse
Conduit	Metal
Control	General Electric PC
Couplers	Van Dorn
Destination signs	Hunter
Door mechanism	Pneumatic
Doors	Sliding
Finish	Semi-enamel
Floor covering	Magnesite
Gears and pinions	Heat treated
Glass	Plate
Hand brakes	Adams-Westlake
Headlining	Steel
Interior trim	Steel
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Special
Motors	Two General Electric, No. 259A, inside hung
Painting scheme	Pullman green
Roof type	Monitor
Roof material	Steel
Sash fixtures	Brass
Seating material	Rattan
Slack adjusters	Westinghouse
Trucks	A. C. & F.
Ventilators	Perry
Wheels, type	Steel tired, 30- and 33-in. diameter

ROLLING STOCK

CLEVELAND SOUTHWESTERN RAILWAY & LIGHT COMPANY, Cleveland, Ohio, has announced the purchase of four new buses in furtherance of its plan to coordinate railway and bus service. These buses, of the latest type and design, consist of White motors and chassis with Bender bodies. They are of battleship gray with nickel-trimmed rear and spacious observation platforms. In addition each seat has individual lighting. Each bus is equipped with non-shatterable glass.

BOSTON ELEVATED RAILWAY, Boston, Mass., has recently ordered a White six-cylinder bus, Model 54.

ALABAMA POWER COMPANY, Birmingham, Ala., reported recently that it was buying two center-entrance type cars from the South Carolina Power Company, Charleston, S. C., for the Gadsen street railway system. The plan was to remodel the bodies in order to provide front entrances and to equip the center doors with treadle devices so they could be used as exits. These double-truck cars are modern in every way and are to replace obsolete equipment in operation in Gadsen.

COUNTY TRANSPORTATION COMPANY, bus operating subsidiary of the New York, Westchester & Boston Railway, has accepted delivery on eighteen 29-passenger Mack city type buses, AB model, four-cylinder, 225-in. wheelbase. This delivery brings the total fleet to 50 Macks.

TRACK AND LINE

TULSA STREET RAILWAY, Tulsa, Okla., has started a $75,000 improvement program. Removal of all joints in the tracks through a process of thermit welding is planned. Twelve miles of track will be relaid and 6 miles will undergo minor improvements. All trackwork is being done between midnight and 6 a.m., while tracks are free from use.

SHOPS AND BUILDINGS

WISCONSIN POWER & LIGHT COMPANY, Madison, Wis., is reported, as proposing a union bus terminal for Madison. The company has purchased property, at a cost of about $150,000, in the heart of the downtown business district, recent advices state, on which it proposes to erect early next year a ten-story office building with an adjoining two-story bus terminal. Tentative plans for both structures have been drawn by architects.

PHILADELPHIA RAPID TRANSIT COMPANY, Philadelphia, Pa., in submitting its financial program for 1928 to the Council, has included liberal allowances for expenditures to various departments. On general shop enlargement and increasing maintenance facilities, the communication stated the sum of $2,000,000 is to be spent. These improvements will affect electric substation equipment. In addition, $175,000 is to be expended on the substation at Third Street and Wyoming Avenue, $450,000 on the substation at 33d and Market Streets and $66,000 on additional rotary-Letterley substations.

ADVERTISING LITERATURE

OHIO BRASS COMPANY, Mansfield, Ohio, has recently published a booklet entitled "Lead Tip Steel Pins for Insulators." The booklet contains sixteen pages in colors with an artistic cover. It treats of the importance of the pin to the insulator, placing particular emphasis on the necessity for proper pin selection to provide the most efficient insulator service. O-B pins, according to the publication, are all knurled and hot dipped galvanized before the lead is specially applied to insure a permanent bond so that the lead does not come loose on the pin. The booklet also describes and lists other O-B products and may be had upon request.

ECONOMY ELECTRIC DEVICES COMPANY, Chicago, Ill., is distributing a reprint of a double-page advertisement of its electric railway and gasoline vehicle meters which appeared in the ELECTRIC RAILWAY JOURNAL of Oct. 8.

CONDIT ELECTRICAL MANUFACTURING CORPORATION, Boston, Mass., has issued a mailing folder descriptive of its switchboards, in which it emphasizes the careful testing they undergo and that "they must be correct to the last detail.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa., has issued circular 1793 in booklet form devoted to a discussion of the application of automatic switching to railway use. The circular is entitled Automatic Railway Substations. It is illustrated and is divided into six sections. They advise that the circular may be obtained at any of the district offices of the Westinghouse company or at the advertising division at East Pittsburgh, Pa.

ALEXANDER MILBURN COMPANY, Baltimore, Md., is mailing looseleaf bulletins B-200 C and B-200 D, illustrating and describing its acetylene generators and its die burners and preheaters.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued an attractive folder, GEK-37, describing its gas-electric drive for buses.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, December 24, 1927 *Number 26*

1928 Convention Goes to Cleveland

ACTION of the policy committee in again selecting Cleveland as the location for the American Electric Railway Association convention, which will be held next fall during the week of Sept. 22-28, may at first be received with some surprise by those who have looked forward to the attractions of Atlantic City as a convention location. Executives who sense the industry's needs will after mature deliberation see the problem of convention location in proper perspective. This should quickly bring widespread approval of the policy committee's judgment and of its courage in acting for what it considered the industry's best interests despite the general popularity of Atlantic City.

There are some, of course, who look upon a convention primarily as an outing; as merely an opportunity to get away from the routine of transportation duties. To them the attractions of Atlantic City are particularly appealing. This is not to say that the social side of a convention, the opportunity for renewing acquaintances and for good fellowship, is not an important phase of an industry's annual meeting. But it is not the most important phase. The serious business of the industry, the study of progress made by other properties, the inspection of developments in equipment and apparatus, the comparison of one's own operating experience with that of others and the acquisition of new ideas should take precedence over all other considerations.

This was the view which dictated the committee's final selection. It was taken only after a careful survey of the industry. The preferences of a large number of railway men from various parts of the country were sounded in advance, and although there existed a considerable sentiment in favor of Atlantic City, it must be remembered that this was expressed without a full knowledge of the situation faced by the several committees which have been studying the matter of location of the 1928 convention.

There was a grave question as to whether the new hall in Atlantic City would be completed in time. A convention in Atlantic City without the completion of this new hall would have been disastrous from the standpoint of continuing the progress made at the last Cleveland meeting. In view of this question about the availability of adequate facilities in Atlantic City, the committee acted wisely in not jeopardizing the success of the convention and the continued progress of the industry by committing the association to the Atlantic City location.

At this critical period in the industry's history an adequate exhibit of cars and car equipment is of paramount importance. At the last convention more progress in this direction was evidenced than at any former similar meeting. As a result, many properties are now seriously studying the possibilities for improving cars to meet present-day transportation standards and traffic conditions. A large number of experimental designs are in progress or are contemplated. This development work is costly both to manufacturers and operators. It seemed therefore extremely important that adequate facilities be provided to give the industry the opportunity of capitalizing to the maximum on this forward-looking work. It is significant that of the manufacturers who expressed themselves regarding this year's convention location, those representing the largest proportion of the total space occupied, were in favor of Cleveland.

Additions to the Cleveland Public Auditorium, which were in progress last October, will be completed shortly and will be available for improved meeting rooms and even better exhibit facilities than those available last fall. The committee's decision represents the mature judgment of men who had the industry's best interests at heart and who reached a conclusion only after the most careful study of all of the factors involved. Their action, therefore, deserves the active indorsement and support of every executive who senses the industry's need at this time.

Echoing the Christmas Message

NO MATTER what our individual conception of the symbolism of Christmas, its message of "Peace on Earth, Good Will Toward Men" strikes a responsive chord in the heart of every man, regardless of creed. It is that chord, attuned to the reception of a sentiment higher than self-preservation and material progress, that constantly throughout the ages has urged man toward higher things.

Surely the message from the humble man of Nazareth has a place in industry. When recognized, it transforms a workaday world with inspiration and romance. Back of the machine that multiplies the work of human hands a thousandfold shines the inspired soul of its designer. Back of the corporation that unites the forces of production and distribution into an intricate and marvelous organization is the heart and brain of a man who has sacrificed leisure and peace of mind on the altar of service and progress.

In the ranks of the transportation industry the message of peace, service and good will has a particularly deep significance. Here romance throbs for every worker whose heart is in the job and who lifts his eyes above the daily task to see the ideals of the organization of which he is a part. On one man's alert watchfulness and devotion to duty sometimes depend the safety and comfort of thousands who intrust themselves and those they love to their public transportation company. On the tap of a hammer, the throwing of a switch, the twist of the wrench of a pipeworker or the bar of the trackman may depend the lives of men, women and children.

Watch a line gang at work in howling storm and darkness! Watch the snow crews on sweeper and plow through the long hours of a driving blizzard! Watch a motorman operate his car safely through the maze of

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modern city traffic, or the conductor leave his post to extend a helping hand to aged or infirm. Here, indeed, is good will toward men!

Despite many hardships, unfair treatment and public misunderstanding, the local transportation industry bends with renewed energy to its duty of transporting daily the thousands who must be carried between their homes and offices or factories. Back of it all is the spirit of public service. In the performance of the men who devote their lives to this task, from president to the humblest trackworker, there is opportunity daily throughout the year to reflect the message that Christmas brings.

Signs and Countersigns

EUROPEAN practice in the methods of marking cars and car stops is far in advance of that in America. Here the companies which go farthest in indicating the stopping points of their cars carry a lettered enameled sign on the span wire or suspended from a bracket on a trolley pole, the sign reading "Cars stop here," or having words of similar meaning. A less effective, although more common, method is to paint on the span wire pole a white band, which may indicate a car stop to some people, but nothing to others. Still other companies do not mark their stops at all, though their cars sometimes stop to receive and discharge passengers at the near corner and sometimes at the far corner.

European practice begins where American practice ends. The companies in Europe which pay the least attention to marking stop points use the lettered signs. Most companies add to this sign the numbers of the car routes which pass that point. Many augment this information by giving also the terminals of these routes. Some include a time-table. In a number of cities the stop signs are arranged so that they are illuminated at night.

European roads lead most of those in America also in the matter of signing their cars and giving the public information about routes and schedules. They indicate the routes not only on the front of the car but at the sides, in wording which can be read a considerable distance away, and they illuminate these signs so that they can be seen at night. An account of European practice in all of these particulars is given in an article elsewhere in this issue entitled "Answering Questions Before They Are Asked."

Much thought has been given in this country to the merchandising of transportation, but advertising the serice is only part of the task of attracting and retaining patronage. Railway companies should make it easy for the passenger to find the car he wants to use and be sure that it is going where he wants to go. Otherwise, their attitude would be like that of a merchant who urges customers to come to his store, but does not tell them where it is, and when they get there, largely by chance, he refuses to inform them where he keeps the goods they want to buy.

The importance which the London Underground Combine attaches to the subject of proper station, car and bus signs is shown by its employment of one official who does nothing but determine what improvements can be made in these signs, i.e., in their design, location and wording. Here is a suggestion from England worthy of adoption here, Mayor Thompson of Chicago to the contrary notwithstanding. He thinks that English ideas should be kept out of this country, but this one might be smuggled in to the advantage of all concerned, and there are other European ideas just as good from which our railways can profit.

It is strange that so many railway companies in America should not have done more in this respect. In other lines of business signs are used extensively. One cannot take an automobile tour, even in the most unsettled parts of the country, without being told at almost every turn about the merits of various tires, hotels and department stores. Some of these display signs, especially in scenic resorts, are so obtrusive as to violate good taste. At every crossroad, also, he will find direction signs put up by automobile clubs, the state authorities or the federal government. But in street railway practice it almost appears that an intending passenger must exercise second sight or exchange signals with the motorman of an approaching car before being sure where it will stop or if it is the one he wishes to board.

It seems at times as if some companies took for their motto the verse from Scripture: "A wicked and adulterous generation seeketh after a sign; and there shall no sign be given to it." If so, they should read further in the same authority and they will learn that signs come from heaven to aid the helpless, weak and ignorant. If more transportation managers would put themselves in the position of car riders, they would soon realize the questions which intending passengers are forced to ask of passers-by because they cannot learn what they want to know from the company itself. These questions should be answered before the passenger asks them, or he will be tempted to use a taxicab or walk.

Concerted Effort Needed for Traffic Relief

CONGESTION of traffic in most large cities continues to grow unchecked. Sporadic attempts to bring some measure of relief by cut-and-try and hit-or-miss methods prove ineffective or are quickly outgrown. Figuratively speaking this tangle and snarl of interfering traffic makes of our city streets a modern Babel which threatens to defeat man's ambition by self-created confusion and lost motion.

It seems to be generally accepted that the situation is growing progressively worse. Among those directly engaged in the effort to bring about relief there is also the conviction that overlapping and duplication of the several bureaus, commissions and private agencies which exist in some communities, and which are invested with varying degrees of power, result in conflicting effort, wasted energy and, in some instances, serious waste of public funds.

Frequently the board of aldermen or the city council employs a traffic engineer working directly under that body's authority and direction. There also may be a city planning commission created by ordinance and invested with broad powers. Such a body is inevitably engaged in preparing plans and in making recommendations that vitally affect both present and future traffic conditions. One finds also, in several cities, a rapid transit commission, whose studies and recommendations are inextricably tied up with the work of the preceding groups. There may be in this same city a transportation commissioner or supervisor who regulates the operation of public transportation agencies, the movement of whose vehicles is a part of the general traffic problem. There may be, also, a traffic division of the police department. In several instances such a department, finding itself

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unable to enforce the traffic regulations recommended by others, undertakes itself to study the problem and to make recommendations for bringing about relief.

So much for government bureaus and departments. Next come the efforts by more or less public-spirited citizens and organizations to aid in bringing about relief. The merchants' association decides to do something about traffic congestion, and if it is aggressive it may hire an engineer to study the situation and make recommendations for improvement of conditions. The automobile club has an interest in the subject and it also starts out to suggest measures for relief, and sometimes carries this on to an active campaign in support of its ideas. And so on *ad infinitum*. The larger the city and the more complex the problem the more agencies one finds advancing suggestions and insisting on the adoption of pet measures.

It needs but casual consideration of this situation to find a basic reason for the lack of progress toward a satisfactory, community-wide policy and plan for relief. Most measures that are adopted are mere expedients to satisfy the popular clamor for action. Until the many government and private groups find some means of pooling their activities in a central planning, transportation and traffic body, with ample funds and power to proceed effectively toward the development of definite policies and a comprehensive plan, there can be little hope of progress toward substantial and permanent relief from present conditions.

Financing on Favorable Terms by Twin City Company

NO SINGLE piece of financing done by an electric railway this year exceeds in interest the offering just made by the Twin City Rapid Transit Company, Minneapolis, of $18,000,000 first lien and refunding 5½ per cent gold bonds at a price to yield the investor more than 5.70 per cent. In some respects it is a criterion as to what other companies similarly situated may be able to do, but it is not desirable to carry the analogy too far. The company has not been without its problems in the past, serious problems at that, but most of the elements affecting it are favorable to successful results in the future. Operation is under indeterminate permits, valuations have been fixed upon which the company is permitted to earn an adequate return, and railway, bus and taxi operation are co-ordinated in the Twin Cities. Cash dividends have been paid on the common stock since 1899.

The accomplishments of the company are self-evident. Of greater interest just now is the purpose behind the present financing. In some respects the issue is in line with the recommendations of the committee on finance of the American Electric Railway Association. As President Lowry has said, the program now adopted will make possible the refunding of all existing debt as it matures and provide complete separation of the bonded debt of the St. Paul City Railway and the Minneapolis Street Railway, the principal constituents of the Twin City Company. The terms of the indenture securing the bonds are of interest because of the provision for the issue of additional bonds, particularly for refunding of obligations of the St. Paul City Railway maturing in 1932, 1934 and 1937. So far as the present offering of $18,000,000 is concerned, of the proceeds $15,000,000 and interest accrued to dates of maturity will be deposited with the trustee to retire $15,000,000 principal amount of funded debt of the pledging subsidiaries maturing Aug. 15 and Oct. 1 next, and the rest to pay for capital additions and other corporate purposes. In short, the Twin City offering is a large issue placed at favorable terms at a time of easy money that appears to afford the company ample ways in which to meet its future maturities and its capital requirements.

What Is Ahead for the Boston "L"

SIGNS all point to the settlement of the problem of the future of the Boston Elevated Railway at the coming session of the Massachusetts Legislature. Just what will be done, however, remains a mystery. The state body may adopted the Harriman plan, which called for the organization of a new company backed by state credit to carry out a comprehensive metropolitan transit plan. It may adopt the plan of Senator Warren for an extension of the present period of public control and private operation. It may adopt the Eliot Wadsworth demand for a return of the road to private control. If the Legislature does nothing about the matter, and that seems very unlikely, the road would at the end of the period of public control revert to the board of directors, who might continue to operate it on the service-at-cost plan and pay dividends at prescribed rates.

In any event two recent occurrences will tend to shape the future. These are the advisory opinion by the Supreme Court replying to the intricate questions of law raised in the Legislature last April with regard to pending plans for the road's reorganization and the more recent report by the Department of Public Utilities which places the reproduction cost of the Elevated at $188,016,892, the transportation value at $118,837,253 and the book value at $109,103,445. This last report, referred to in the JOURNAL for Dec. 17, is of particular interest. It fixes the option price of about $109,000,000 secured to the Commonwealth by the Act of 1918 under which the road is now run at about $10,000,000 less than the direct going value determined by the Department of Public Utilities and at $20,000,000 less than the conservative net value found by subtracting depreciation from the full reproduction cost. The report by the state commission certainly substantiates the statement, repeatedly made, that the railway represented an honest investment under public supervision that had prevented excessive issues of stock or bonds.

It is impossible to refer here to all the factors in the situation or to consider their intricacies. As indicated previously, the disposition of the matter rests with that unknown quantity the State Legislature. If the Governor has his way there will be no exercise by the state of its right to take over the road. He believes that the situation is one which gives the state a distinct advantage but that the solution of the Elevated problem lies in a continuation of public control without public ownership.

The present plan was adopted almost ten years ago at a time the struggle of the management to provide service for a 5-cent fare had brought about suspension of dividends and depreciation of property. It has worked well. At that time the problem was to secure the continuance of the service in an adequate manner. The public control act achieved that end. There would appear to be no reason why the present plan should not be continued with such changes and modifications in it as the working of the original act has shown would be advantageous.

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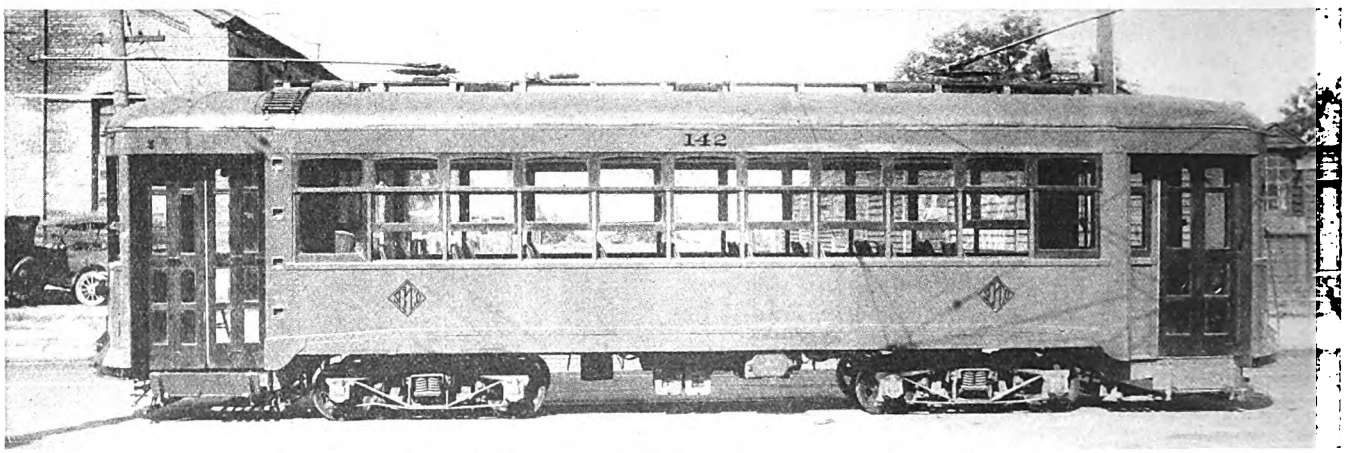
Saving a Small System

Complete rehabilitation of cars and track, reorganizing departments and systematizing shop practice have reduced operating costs materially and put the railway on a paying basis

By Horatio Bigelow
Superintendent of Railway South Carolina Power Company, Charleston, S. C.



The rebuilt double-truck cars are very attractive and are economical to operate

WHAT can be done to solve the problem of reducing operating costs and putting a comparatively small road on a paying basis is afforded in the experience of the railway system of the South Carolina Power Company at Charleston. A complete rehabilitation program involving the remodeling of many old cars and the purchase of several new, improved, Birney-type safety cars along with reorganizing the personnel, studying traffic problems and accident reduction, selling rides by advertising, effecting economies in several departments and systematizing the entire shop organization and practices made a new road of this street railway.

Co-operation of Men and Management Secured

Not long ago a state of armed neutrality prevailed between the man and the management. As often happens, the trainmen and shed force were continually at odds. Today they are pulling together and men and management are a 100 per cent unit combined to finish the job of saving the railway. Teamwork, without which results could never have been obtained, is now evident in every department. Each man has been sold on the possibilities and responsibilities of his job. Every employee has been brought to realize that advancement or failure depended on his own individual record, and if given sufficient rope the undesirable elements hung themselves.

Close contact with the trainmen was maintained by monthly meetings with their committee and on their invitation by regular talks before the monthly meetings of their local. Frequent talks with the shed force also kept up their interest. At these meetings, employees were posted frankly as to conditions in the railway department, insuring their utmost efforts to maintain their jobs and, incidentally, to help save the situation. Courses in "Public Utility Economics" and "Electric Railway Transportation" besides putting men in line for promotion made them supporters of the management through a better understanding of the business.

Influence of Unified Organization Far-Reaching

The unified railway organization had a far-reaching influence. Average schedule speed of the system was increased 20 per cent, from 7.5 m.p.h. in 1923 to 9 m.p.h. at present, despite an increase of 40 per cent in one-man car operation and a considerable increase in traffic congestion due to the doubling of the number of automobiles during the period. In 1923, 77 per cent of the cars operating were "on time." The last traffic check showed that 95 per cent of the cars operated were on schedule. The trainmen at first viewed the new and faster schedules with consternation and said, "They can't be maintained." It was pointed out that such schedules were being maintained on comparable systems, and that the men's jobs might hinge upon the solution of the problem. The problem was solved.

The management did its share to help the trainmen in their efforts. Careful and constant checking of schedule maintenance by the supervisory force was a big help, as was the elimination of unnecessary stops. A third was the relocation of turnouts. Also, by co-operation with the steam railroads delays at grade crossings were reduced to a minimum.

Five different types of cars were in use in 1923. Most of them were too large, not suited for one-man operation and expensive to operate. By remodeling several of the cars for one-man operation, purchasing new, improved-type Birney safety cars, adding some double-truck cars in good condition and retiring the obsolete

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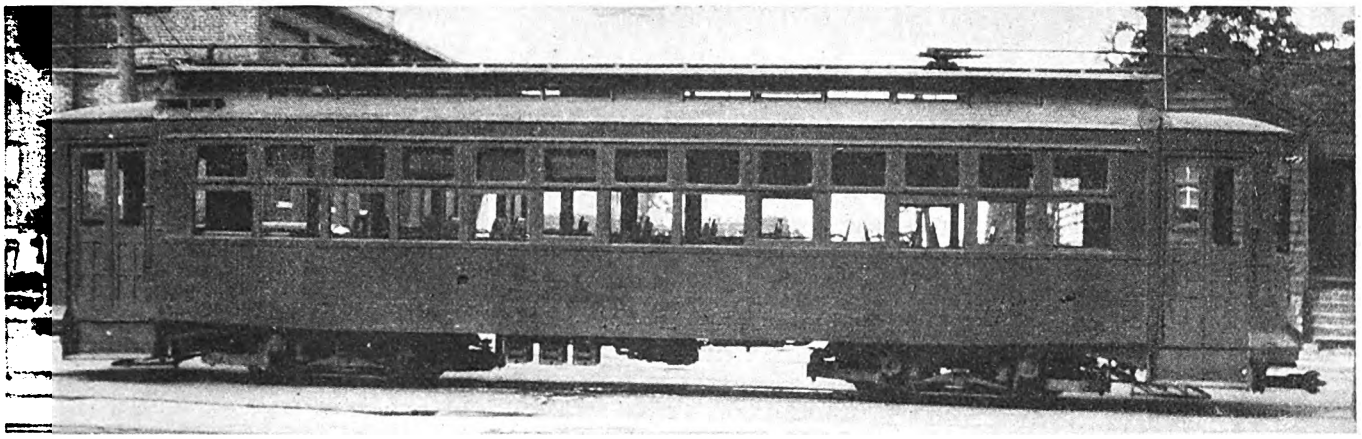

Double-truck cars weighing 23 tons and costing 2.25 cents per car-mile for maintenance were retired from service

cars the company was able to reduce operating and maintenance costs to a minimum. At the same time the service was made more attractive to the patrons. Full details of this car rehabilitation program were contained in an article appearing in the Sept. 17 issue of this paper, page 489.

When the city launched an extensive paving program requiring four years for completion the railway laid plans for reconstructing its tracks. The smooth track made possible the extensive operation of single-truck cars. A program of rerouting to avoid duplication of service was carried out and unnecessary track was abandoned. Single track was substituted on some lines that did not warrant a double track.

Traffic Situation Alleviated

Charleston, with its narrow main thoroughfares, is not free from traffic problems. Through co-operation between the management of the railway and the police department however, the situation has been alleviated considerably. Convictions for parking automobiles improperly were increased 600 per cent. The increase in schedule speeds also bespeaks the work of the two bodies.

Accidents have been reduced 50 per cent during the period under consideration. The campaign to this end was begun with a "Trainmen's Bulletin," setting forth the total cost of claims filed against the railway and showing that immediate action was necessary to remedy the critical condition. This was followed, at the trainmen's invitation, by a series of talks on accident prevention before their local. A graphic "Trainmen's Accident Record" was maintained in the dispatcher's office giving names, badge numbers, dates and classification of accidents. Each trainman who worked twelve months without an accident was given a gold safety button. In training new men, special care was taken to show them the quickest method of making emergency stops.

In any accident where a question arose as to the trainman's liability, he was summoned to the superintendent's office for a review of the circumstances and advised how to prevent a similar accident. In many minor accidents where the trainman was clearly at fault he was required to pay personally for the damage if he desired to retain his position. If a man's accident record showed that he could not, or would not, improve in this respect he was dropped.

Advertising and Selling Rides

In 1923 an advertising campaign set forth the benefits to be gained by patronizing the railway. Figures showing the condition of the system and that the public could buy street car service for $1 which cost $1.25 to produce were effective.

When the railway prepared its program of car and track rehabilitation, a thorough knowledge of the company's predicament was told by its advertisements. Because the city administration knew the facts no opposition to the plan was voiced. Again when the railway company petitioned the city for abatement of paving charges little argument was necessary, for the company's frank publicity already had presented its case.

"Giving the public somewhere to go," was the theme

Removing track on Bay Street, using concrete breakers to remove sections of old pavement

Street and track improvement on Meeting Street, showing the west half completed

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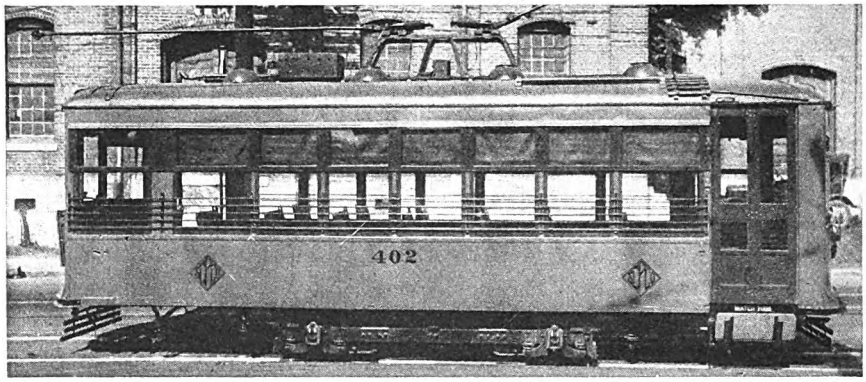
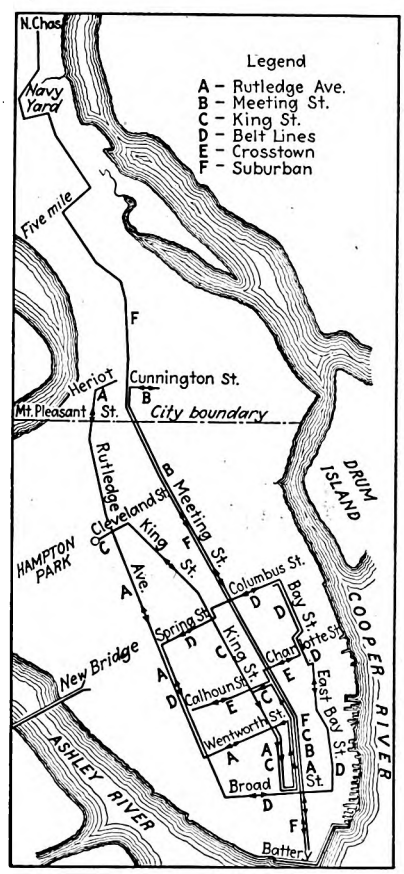


Improved Birney-type cars weigh but 6 tons and consume 1.10 kw.-hr. per car-mile, a saving of 0.92 kw.-hr. over the old cars

of a plan to increase riding. For example, for the colored patrons of the system, 50 per cent of the total passengers carried, a small park located on one of the car lines was given nominal financial encouragement and advertised on the cars. Five months operation of this park increased the gross revenue through additional patronage to such an extent that 250 per cent was realized on the investment.

In another attempt to bolster up car riding the inconspicuous standard car color was changed to a bright orange. The first car that came through the paint shop in its changed garb bore slogans to advertise street car riding as the most economical and safe transportation medium. It was run for three days in regular service on each of the city lines. During the first three days operating receipts were 6 per cent higher than those of the other cars on the same line. A favorable editorial carried in one of the local papers regarding this innovation proved the experiment a decided success.



Six street car routes serve the city of Charleston, S. C.

Several minor changes of practice and organization have reduced operating costs a surprising amount. Energy conservation was obtained through further instruction of trainmen in the use of power and handling air brakes. The men's interest was aroused and co-operation obtained by comparative graphic records. As a check on energy consumption enough recording watt-hour meters were provided to equip one car of each type operated and these cars were so rotated in service as to obtain a measure of the same results as if all cars were equipped with meters, with 87½ per cent less cost. The saving effected was over 10 per cent, measured in kilowatt-hours per car-mile.

A more efficient system of fare collection and registration resulted in a smaller loss of gross revenue. The year before the system was installed gross revenue decreased 18 per cent. During the next year nine months' gross decreased 9 per cent and the first full year it was in operation the decrease was 5 per cent. Incidentally, the proportion of total revenue increased 10 per cent.

A "Daily estimate, income from operations" sheet, showing relation of actual revenue to operating expense, based on a closely estimated car-hour cost, served as a check on the profit of the service. Together with frequent traffic checks it made possible the proper co-ordination of schedules with traffic requirements, reducing car-hour wastage to a minimum while fulfilling the demands of the riding public.

Reduction of forms in size and number and combination of some of them has saved money without sacrificing the detailed information required. The purchase of a mimeograph machine aided this work.

The storeroom account had shown little reduction since the war period. A close check of quantities required cut this account 20 per cent, with consequent saving in money tied up in stock and interest thereon.

Careful reorganization of the supervisory force resulted in a 50 per cent reduction of this body, with improved efficiency. Understudies were provided for all positions in preparation for emergencies such as vacations, vacancies, illness, etc.

When shop employees were paid off during working hours, practically every man came back to the receiver's office for change. The loss of time was obvious, so the system was changed. Today the men are paid off at quitting time and a saving of 2 per cent per year has been gained.

Comparison with other systems, as well as an improved account classification, directed attention to possible economies in shop organization. In 1923 the force consisted of more than 60 men. In 1924 it was reduced 39 per cent; in 1925, 8 per cent; and in 1926, 10 per cent, a total over the period of 57 per cent. In 1923 the railway employed one shop man for every 22,000 passenger car-miles operated; now there is one employee for every 47,000 passenger car-miles operated.

Maintenance Costs Cut to Half

Increased efficiency and modernization of shop practices, introduction of forms necessary to provide information placing definite responsibility for car failures and abnormal costs, together with the co-operation of the shed force obtained the result that car mileage per pull-in was increased from 1,200 in 1923 to 6,500 in 1926—more than 400 per cent. During the same period, the maintenance cost per car-mile was decreased from 4.95 cents in 1923 to 2.65 cents in 1926, practically 50 per cent reduction. Some of the practices that were a means to this end are given in brief form.

The adoption of the spray method reduced the labor cost of painting cars 40 per cent. It made possible the completion of necessary work in three-quarters of the

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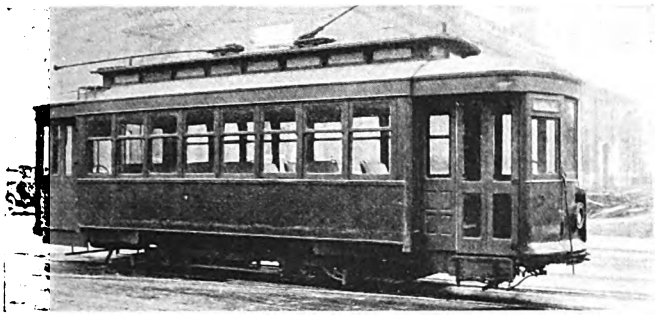


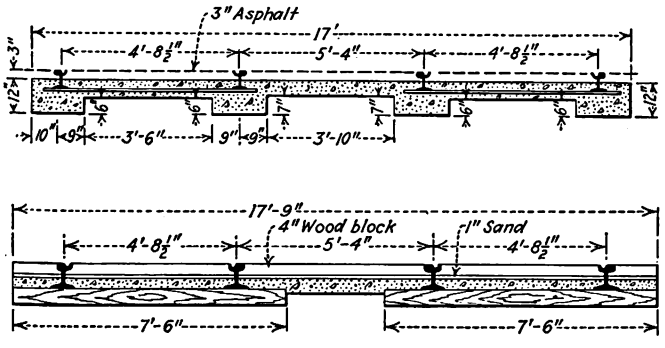
The old single-truck cars weighed 14 tons, consumed 2.02 kw.-hr. per car-mile and had a maintenance cost of 3.15 cents per car-mile

time formerly required, and the painting force was used to advantage on outside work during the time saved, with consequent credit to maintenance of cars.

Waxing cars, instead of washing, has made possible the use of a much cheaper system of painting, and the paint lasts half again as long as resulted from the former more expensive system. It has effected a 25 per cent saving in labor.

Dipping and baking of armatures and fields has increased mileage of armatures from 150,000 to 308,000, more than 100 per cent, and that of fields proportionately. For one type of motor in regular operation, thirteen armatures had to be rewound in 1925. In 1926 this was reduced to two. The dipping and baking outfit was assembled and constructed from scrap material at a cost of less than $30.

Life of armature bearings was far below the average. Purchase of a pyrometer for $50 insured pouring of bearing metal at the proper temperature. The bearings were pressed on under sufficient pressure and care was



Old and new construction for double track. Wood ties are replaced by No. 3 standard steel ties, and asphalt is substituted for wood block

taken to see that the bearings were kept free from dirt and grit. These methods have increased the life of armature bearings 65 per cent.

The actual expenditure for a circuit breaker testing set was $4. It has been helpful in the reduction of maintenance of electrical equipment of cars. Polarity tests for motors have had a similar result, with a saving of time in assembling motors. Radio testing for defects in electrical equipment proved practical, low armatures even being discovered by its use.

The cast-iron wheels used were found to have a sufficiently thick chill to warrant a trial of wheel-truing brakeshoes. The trial was successful and the continuance of this practice increased car wheel life from 18,000 to 60,000 miles, or 300 per cent. Standardization of brake heads made possible the use of a number of brakeshoes that had been classed as obsolete along with the cars for which they were originally purchased. Improved brake rigging, costing $30 for each car, avoided the necessity for the purchase of slack adjusters and reduced "pull-ins" and maintenance costs.

Lubrication costs were reduced 13 per cent through continuous checks and employee instruction in economical methods, and trolley wheel mileage was increased from 4,500 to 8,000 miles through improved lubrication. By using both ends of brushes, the cost per mile of carbon brushes was reduced from 0.034 cent to 0.015 cent.

Statistics on Interstate Electric Railways

OF THE electric railway companies of the country 252 do an interstate business and report operating statistics to the Interstate Commerce Commission. Some of these, like the United Electric Railways of Providence, R. I., are primarily city systems but have interurban extensions. Others, like the Kansas City Public Service Company, report because some of its city lines cross the border line of two adjoining states. But most are primarily interurban lines. Some of the statistics, contained in a report of the Interstate Commerce Commission, Bureau of Statistics, for the year ended Dec. 31, 1926, are given in the accompanying tables.

Ranked in the order of gross operating revenue, the Pacific Electric Railway of Los Angeles, Cal., is by far the largest company reporting, its total operating revenues for the year amounting to $19,111,164. The Hudson & Manhattan Railroad comes next with $8,855,678. The United Electric Railways of Providence, R. I., comes third with $8,193,660. The Chicago, North Shore & Milwaukee comes fourth with $7,730,152. The Kansas City Public Service Company comes fifth with $7,664,599.

FINANCIAL AND OPERATING DATA FOR CALENDAR YEAR 1926 OF INTERSTATE ELECTRIC RAILWAYS

Item	Total, All Districts	Eastern District	Southern District	Western District
Number of companies reporting	252	167	8	77
Miles of road operated	13,221	7,613	453	5,155
Freight revenue	$39,382,332	$15,531,408	$2,629,703	$21,221,221
Passenger revenue	138,428,701	78,771,689	2,196,964	57,460,048
Total operating revenues	$191,949,159	$102,350,282	$5,197,002	$84,401,875
Total operating expenses	160,702,288	85,228,330	3,931,971	71,541,987
Taxes assignable to railway operations:				
Other than U. S. government taxes	$11,300,002	$6,128,924	$445,081	$4,725,997
U. S. government taxes	997,495	659,496	110,787	227,212
Operating income	36,137,540	24,547,000	1,337,964	10,252,576
Net income	12,216,134	6,512,243	22,224	5,681,667

SUMMARY OF SELECTED FINANCIAL AND OPERATING DATA FOR CALENDAR YEAR 1926

Item	Total, All Districts	Eastern District	Southern District	Western District
Rolling stock:				
Buses	998	568	1	429
Passenger-carrying cars	11,843	6,957	272	4,614
Freight cars	16,483	6,024	341	10,118
Other cars	3,279	1,971	76	1,232
Locomotives	586	234	26	326
Mileage, traffic and miscellaneous statistics:				
Passenger car mileage	368,635,296	198,130,555	7,355,580	163,149,161
Freight, mail, and express car mileage	74,844,585	28,265,370	4,244,230	42,334,985
Revenue passengers carried (thousands)	1,343,757	811,079	25,005	507,673
Operating revenues per car-mile (cents)	43.282	45.209	44.802	41.075
Operating expenses per car-mile (cents)	36.237	37.646	33.897	34.816

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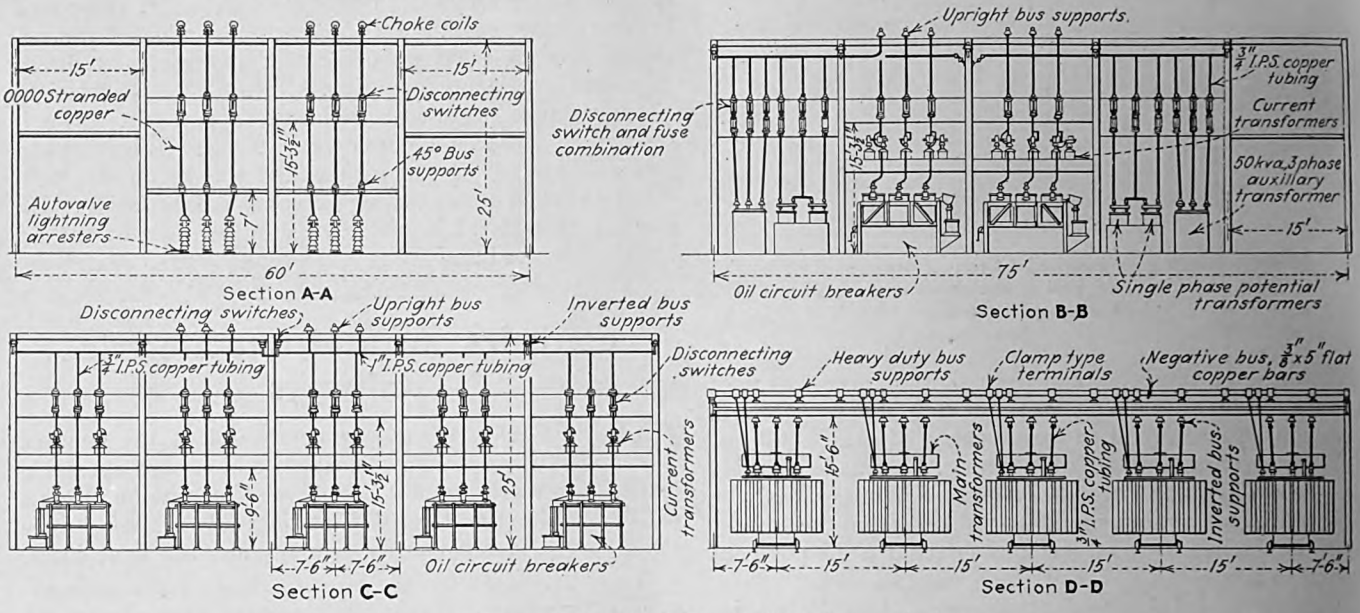
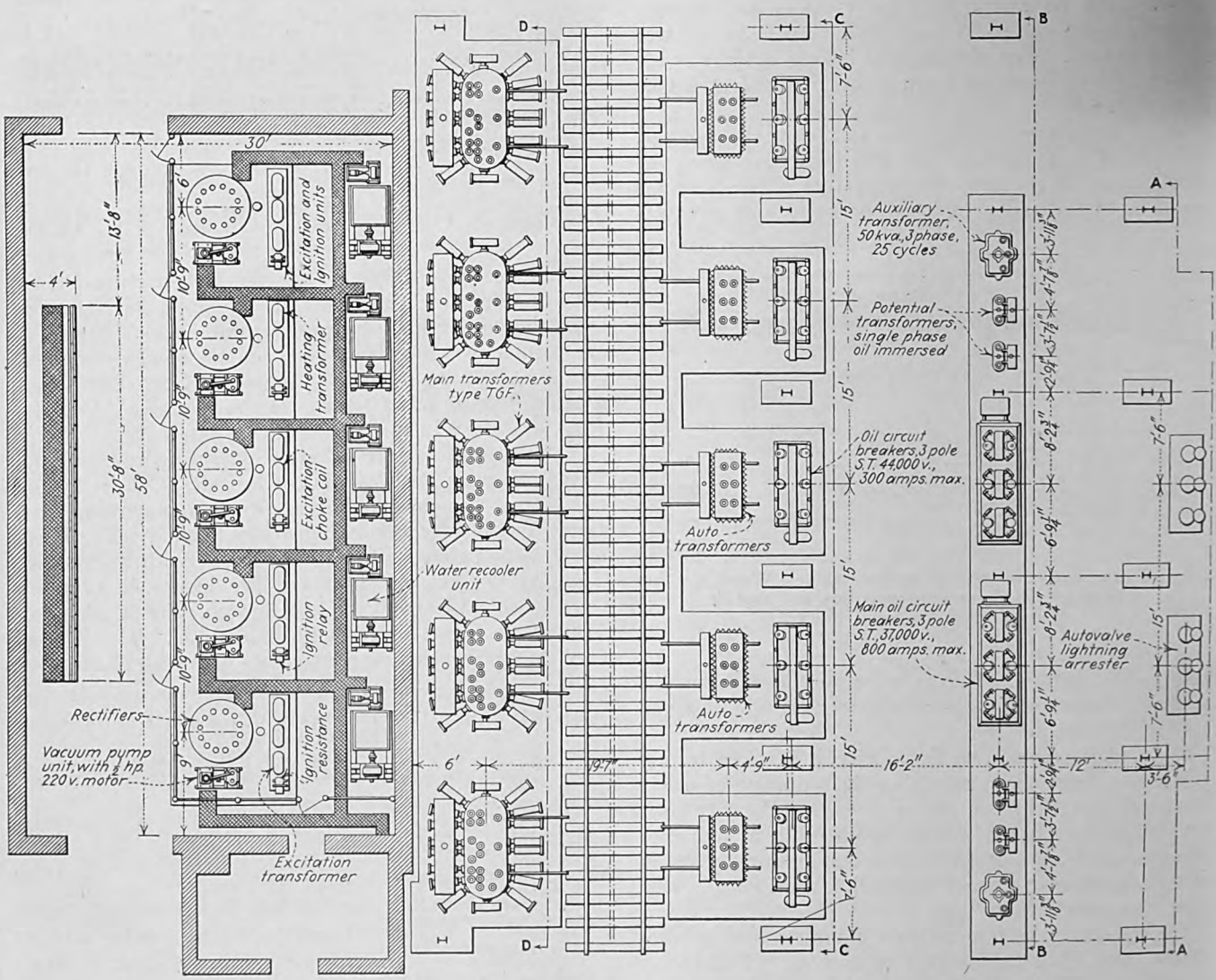
Layout of Mercury-Arc Rectifier Station at Bridgeport, Conn.



Cross-sections at A-A, B-B, C-C, and D-D of ground plan



Ground plan of new substation

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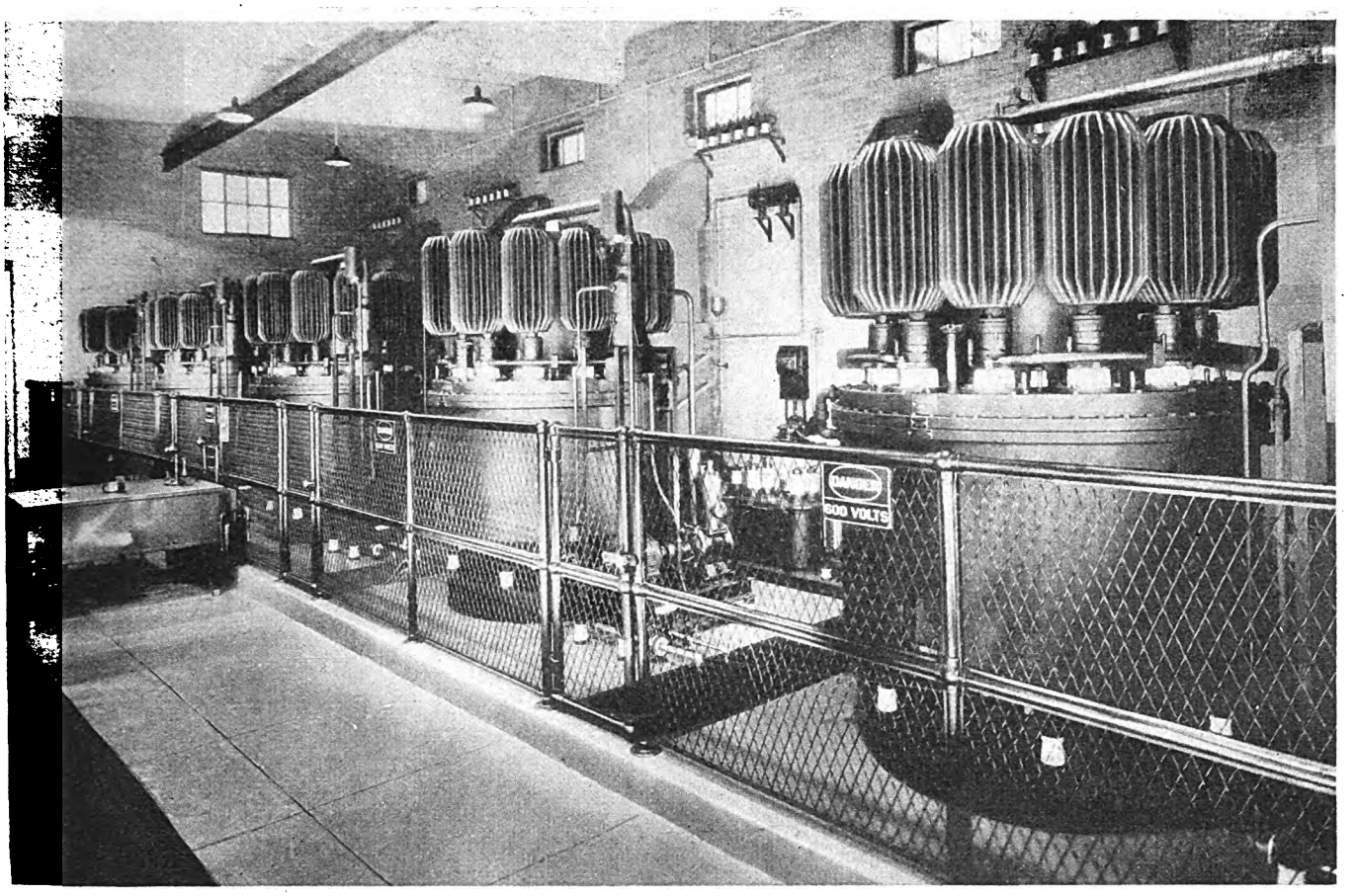

This battery of five 2,000-amp., 600-volt mercury-arc rectifiers is said to be the largest installation of its kind in the world

Largest Mercury-Arc Rectifier Installation Made at Bridgeport

Connecticut Company has replaced old generating station by two new substations. Energy is now purchased. Operating cost has been reduced more than 25 per cent

WHAT is said to be the largest installation of mercury-arc rectifiers in the world has been made by the Connecticut Company at Bridgeport. Two new substations have been designed and built under the supervision of George E. Wood, power engineer, one in the center of the city having five 2,000-amp., 600-volt units and a second in the nearby town of Stratford having two units of the same size. These are among the first substations where the entire load is carried on rectifiers. The pre-eminence in capacity of the Bridgeport substation may be of short duration, however, as an order has already been placed by the Commonwealth Edison Company of Chicago for two 5,000-amp., 600-volt rectifiers and it is possible that the size of this installation may be increased in the near future.

The designs of the new substations are the result of studies commenced early in the fall of 1926 by the Connecticut Company looking to the creation of modern power facilities for its electric railway lines in that district. The company's Seaview Avenue generating station was antiquated and costly to operate. Its location was remote from the load center and considerable loss was occurring in the trunk feeders. Another influential factor was the impending necessity for the company to spend about $60,000 for a new submarine cable crossing at the Yellow Mill River, where the city was planning to relocate an important highway bridge.

Studies made by the company's engineers indicated that the power demands could be met most satisfactorily by the construction of two substations, one in the vicinity

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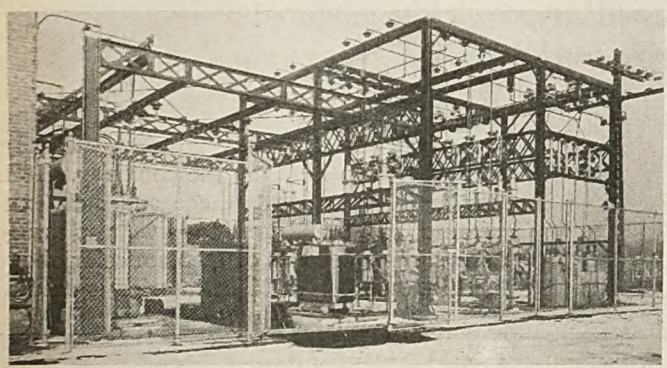
as well as ... his board has breakers ... the incoming ... are provided with five taps 2 per cent above normal rating and five taps 2 per cent below normal. The reason for the use of these units is to permit operation at 6,600 volts, 11,000 volts or 13,900 volts as desired. It was felt by the designing engineers that it would not have been feasible to design the main transformers to operate satisfactorily at these various voltages.

Inside the substation are the five rectifiers with their ... mounted also the main and auxi... are five rectifier panels, on which are mounted ... remote control switches, d.c. circuit breakers, overload, reverse power and thermal relays, as well as switches for the rectifier auxiliaries, d.c. ammeters and vacuum indicators. At the other end are fourteen feeder panels with circuit breakers, switches and ammeters.

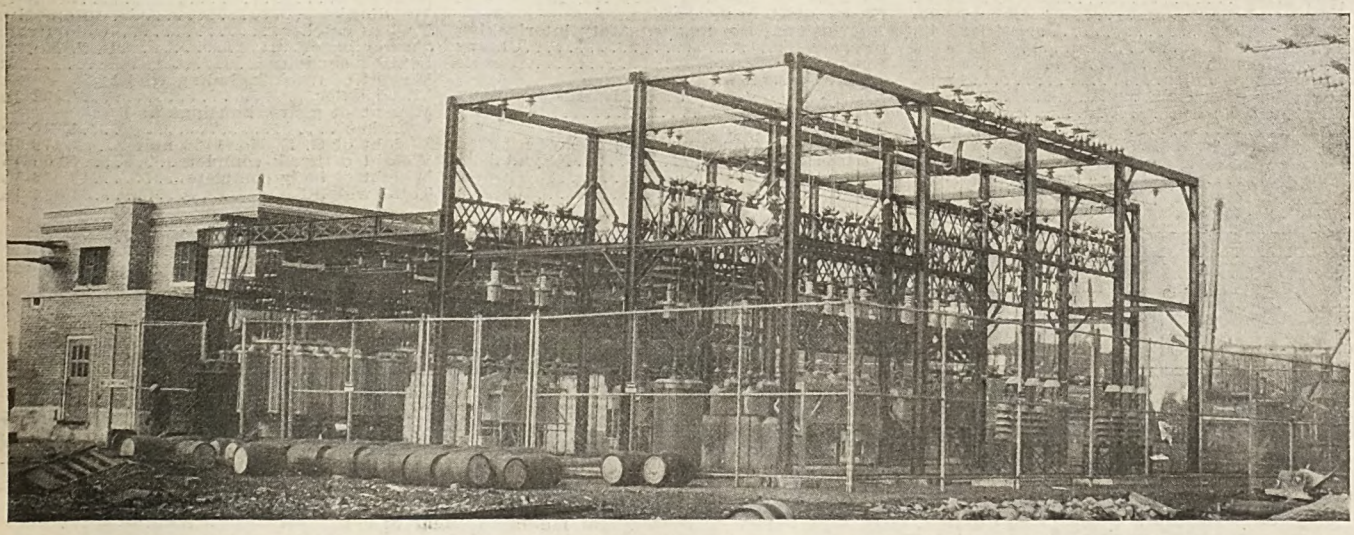
All auxiliary switches are normally closed. The procedure to put a rectifier in service is to close the a.c. circuit breaker, then the d.c. circuit breaker, check the voltage and close the main rectifier switch.

Work on the building at Bridgeport began March 27. The first unit was put in operation Aug. 15 and all were in operation by Sept. 26. No trouble of a serious nature has been experienced since these rectifiers have been in service. The longest interruption has been one minute, and in every instance where a rectifier has gone out of service the same unit has immediately been put back. There has been no radio interference and only slight telephone interference, which has now been eliminated.

An over-all efficiency of 93 per cent, including line losses, has been obtained since the rectifiers have been in operation.



Outdoor equipment at Stratford automatic substation, which is similar in design to the new Bridgeport substation



Outdoor equipment of new Bridgeport substation of the Connecticut Company, showing incoming 13,900-volt, three-phase, 60-cycle transmission lines, oil switches, circuit breakers, auto-transformers and main transformers

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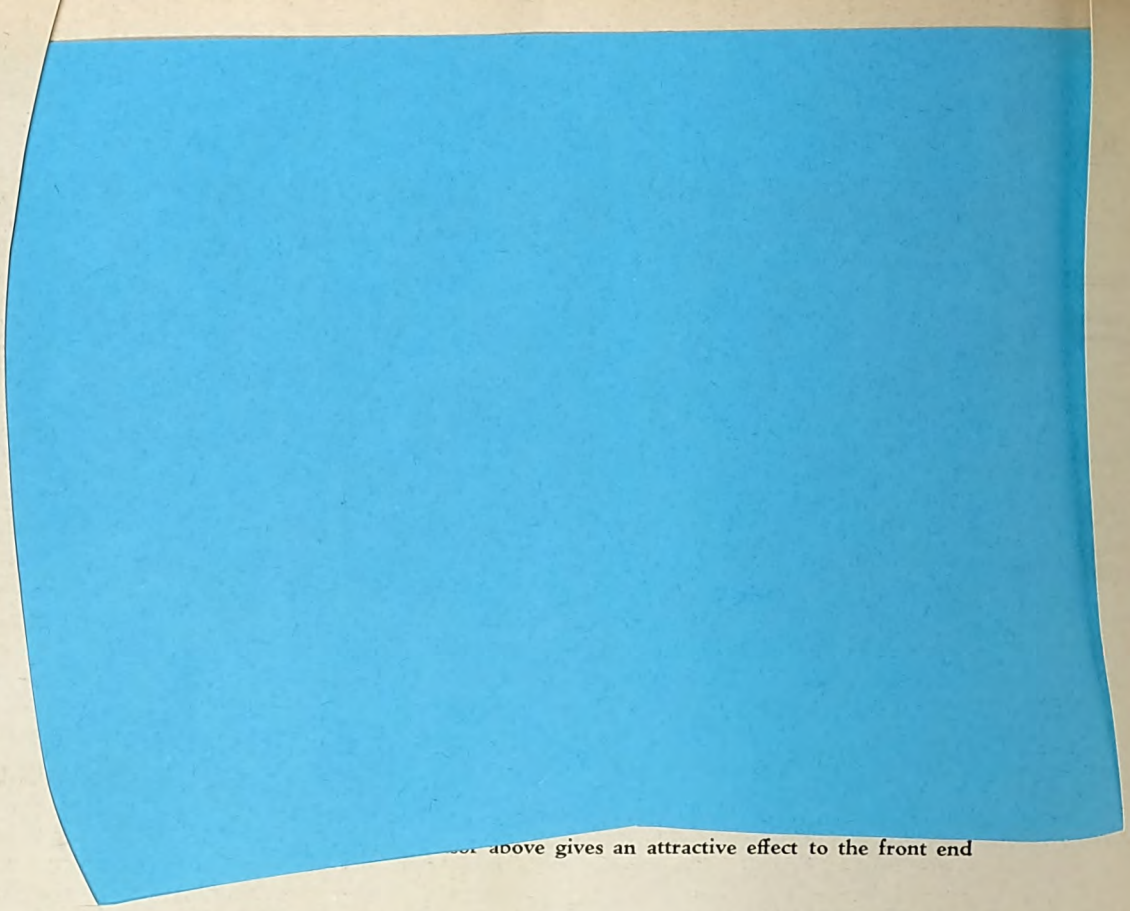


...or above gives an attractive effect to the front end

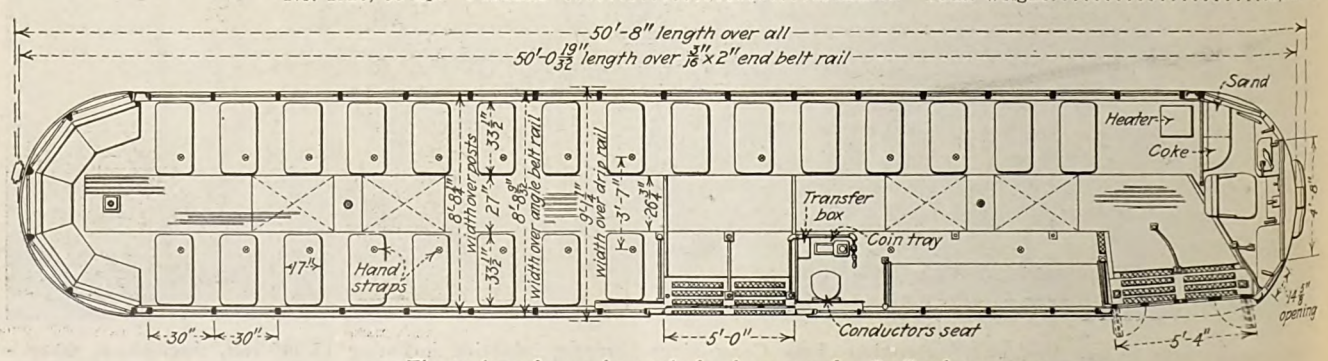
Aluminum Car Tested in St. Louis

Large front-entrance, center-exit, single-end car, designed for light weight and quiet operation in congested city service, is mounted on worm-drive trucks

SPEEDY, easy riding and attractive, the new car just placed in service by the United Railways of St. Louis should win customers and please the public. With a few exceptions the entire underframing is constructed of duralumin. This material has also been used in the construction of some of the equipment parts. The general appearance of the body is much the same as that of the cars now operated by the company. It is a single-end car and has front entrance and side exit. Streamline painting has been used to give a pleasing effect. The color scheme consists of a cream color above the arm rail, with orange below. The interior is natural

DIMENSIONS AND EQUIPMENT USED IN EXPERIMENTAL ALUMINUM CAR

Length over all	50 ft. 8 in.
Width over all	9 ft. 1½ in.
Height over trolley board	10 ft. 11 in.
Side post centers	30 in.
Side glass	26 in. x 26 in.
Front-end glass	28 in. x 54 in.
Truck centers	24 ft. 6 in.
Truck wheelbase	5 ft. 6 in.
Journal centers	5 ft. 9½ in.
Diameter of axles	4½ in.
Diameter of wheels	26 in.
Worm-drive ratio	7⅝ to 1
Gage	4 ft. 10 in.
Type of truck	Timken Detroit with worm drive and differential axle
Motors	Four General Electric No. 1126, 35 hp.
Air brakes	Westinghouse automotive type with DH-16 compressor
Control	K-75-A
Line switch	General Electric No. 986
Seats	Hale & Kilburn No. 208 de luxe
Door operating mechanism,	National Pneumatic, safety interlocking
Interior trim	Cherry
Headlining	Agasote
Sash and sash fixtures,	O. M. Edwards Company
Car signal system	Faraday
Curtain fixtures,	Curtain Supply Company, Ring 88
Curtain material	Wyndasote
Destination sign	Hunter
Farebox	Johnson
Heater	Peter Smith hot air
Headlight	Ohio Brass
Step treads	Feralun (aluminum)
Sander	Nichols-Lintern
Register	Security
Handbrake	Automotive
Trolley catcher	Ohio Brass
Trolley base	U. S. No. 20
Seating capacity	60
Weight of truck including wheels and axles	4,302 lb.
Weight of gears, housings and brakes	1,240 lb.
Weight of G. E. No. 1126 motor	479 lb.
Weight of truck complete	6,500 lb.
Weight of body complete	19,554 lb.
Total weight	32,054 lb.



Floor plan of experimental aluminum car for St. Louis

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cherry with cream ceiling. All woodwork above the windows is stippled to harmonize with the light ceiling and cherry trim.

Cross seats are used except for a single longitudinal seat at the front right-hand side, which provides for five passengers. With a semi-circular seat at the rear, the total seating capacity is 60. The cross seats are non-reversible. They have a cane covering trimmed with Spanish brown leather. Deep springs are used in the cushions and backs.

A cabinet houses the front-end control and air-brake equipment. A large front-end plate-glass window measuring 28 in. x 54 in. gives free vision to the operator. There is a metal visor, above which are roller signs to give the route number and destination.

Twenty-five 36-watt inside frosted lamps provide the illumination, and these, together with the light colored ceiling, give a very brilliant effect.

The car is arranged for either one-man or two-man operation. For use when operated as a one-man car there is a backing-up control equipment which is installed in an aluminum stanchion placed in the center at the rear of the car. A foot gong is also provided in the base of the stanchion. This arrangement of the control equipment makes it possible for the motorman to back the car without disturbing passengers.

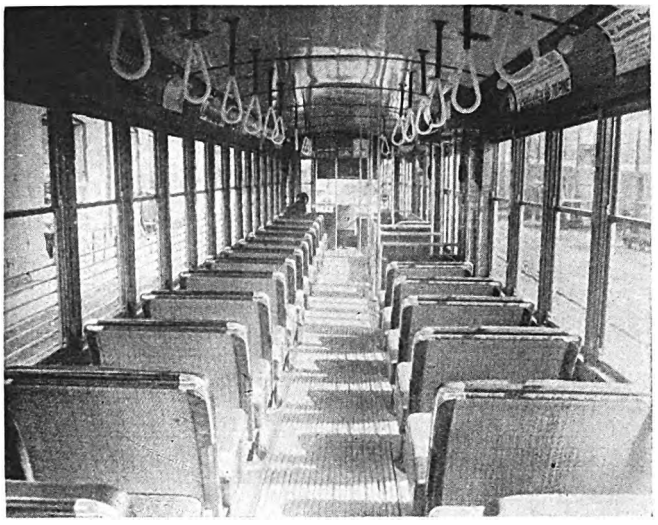
The General Electric No. 1126, 600-volt motors have been designed especially for this purpose. They are considerably lighter and of smaller dimensions than the standard railway motor of the same horsepower. The four motors, rated at 35 hp. each, are spring suspended and connected to the axles by flexible propeller shafts and worm drive. Each motor is suspended longitudinally from the truck frame in such a manner that the mass consisting of the motor and part of the drive is spring supported. The driving connection between the motor and worm is made by means of a short shaft fitted with flexible couplings at its ends.

The axles are Timken Detroit, and the gear ratio is $7\frac{2}{3}$ to 1. To reduce the transmission of noise rubber has been used in many places, such as at the center plate and side bearings. The wheels are also of experimental design intended to reduce operating noise to a minimum. Copper jumpers provide a path for the electric current.

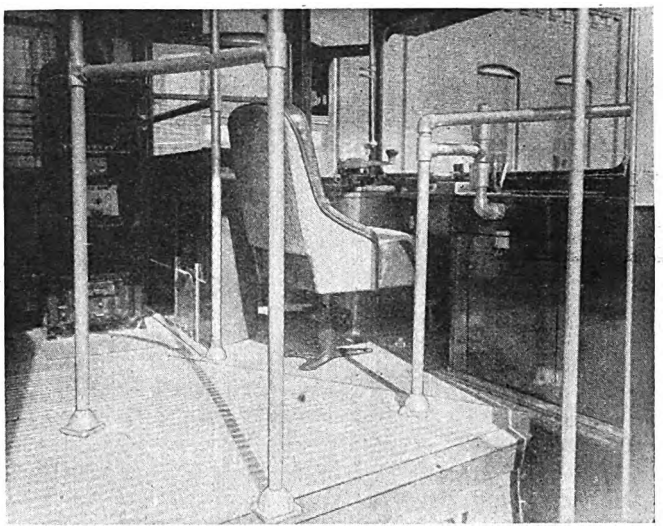
Brakes are of the internal expanding drum type having metal brakeshoes. They are applied by Westinghouse air diaphragms, an individual diaphragm being used for each brake. The brake drum is located approximately at the center of the axle, thereby equalizing the torque set up in the axle at each brake application. This particular design is used as a means to reduce noise and provide a more uniform braking of cars than is possible with the conventional brakeshoe on the wheel.

Comparison of the weights of the worm-drive truck with standard trucks operated by the company and equipped with the regular GE-265 traction motors shows that the worm-drive truck complete with two motors weighs about 1,000 lb. less, or 2,000 lb. per car.

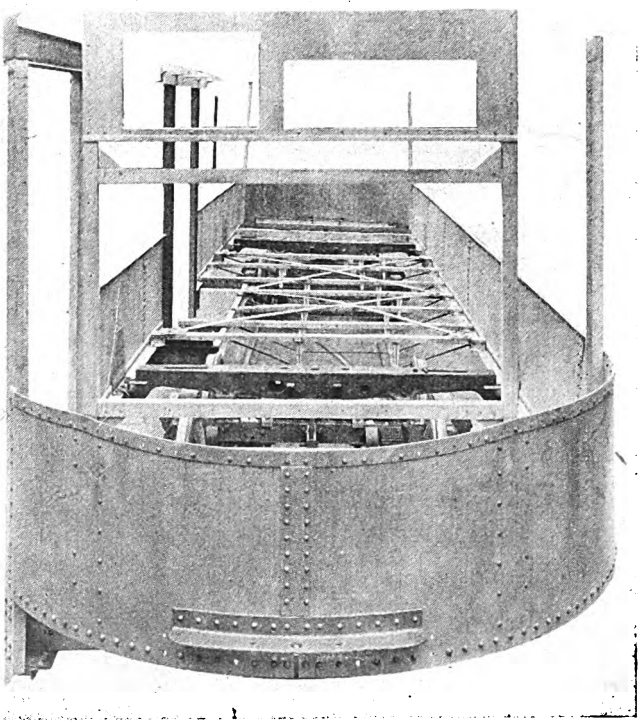
Particular attention has been given to keeping the weight low, so that this car weighs but 32,000 lb. as compared with 40,000 for other new types of cars operated by the company. While the cost of the car is somewhat greater than for previous types, it is expected that the saving in energy consumption will offset this increased cost. The first trial run was made on Oct. 25. Following this preliminary test of performance the car was exhibited in the main thoroughfares of the downtown district of St. Louis.



Seat cushions and backs are cane covered with deep springs. A trimming of Spanish brown leather gives a pleasing effect



The control and air-brake equipment is housed in cabinets at the front end of the car



The underframing was constructed almost entirely of duralumin

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The London Underground management takes no chances that passengers will get on a wrong train. This station indicator at St. James Park station on the Metropolitan District Railway indicates by illuminated numbers the destinations of the next three trains which will stop at this station

Answering Questions Before They Are Asked

European electric railway and bus companies have developed a very effective method of signing their stopping points as well as their cars and buses

By Henry W. Blake
Senior Editor *Electric Railway Journal*

QUESTIONS about the service that are most frequently asked by a person wishing to travel by an electric railway to some destination are: Where can I get a car? How often do they run? How near does it go to the point I want to reach? How long does it take? How shall I know when I get there?

If the person is a regular patron of the line he knows the answers to these questions. If he does not travel regularly on the line and cannot get satisfactory answers to these inquiries, he will often ride in a taxi when a car or bus would have taken him to his destination just as quickly and more cheaply.

One of the principal features of European electric railway and bus practice to impress the visitor from America is the excellent ways in which these questions of intending and actual passengers are answered before they are asked. This may be due, in part, to the larger number of tourists in European cities and the consequently greater need to cater to this class of traffic. Be that as it may, it is very easy for a person in a European city to find the car or bus which will take him to any desired point, and where he can board it. After he does so he can learn from notices and maps on the car or bus when he is approaching his destination.

The principle upon which this method is based is the identification of all routes by numbers or letters which are carried in a conspicuous position on the car or bus. The same numbers also appear in maps distributed by the company of its different routes, on the stop signs to show which routes pass those points, on the backs of transfer tickets where routes have to be designated, and in other ways. The position of this number on the car and bus is usually on the hood, with often a list of the principal points passed on the route. The number and list are often repeated on the sign carried on each side of the roof.

In London the law requires all buses to carry such a list on both their front and rear ends, and the list must read downward in the direction in which the bus is going.

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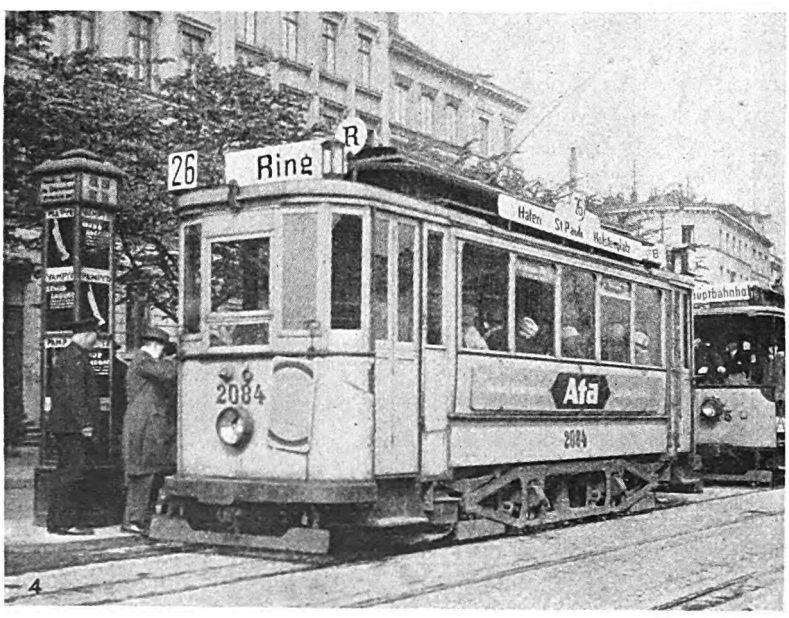
A feature of European electric railway and bus practice is that the route is clearly indicated on the vehicle by number and lettering

1 and 2. London buses carry route numbers at the front, rear and sides. They also display the principal points on the routes, on a large sign at the front and rear of the bus.

3. Car in Florence, Italy, in front of the famous cathedral. Route signs with number and lettering are carried on the front and on the sides.

4. This view in Hamburg shows not only the route lettering and numbers on the front and sides of the car, but also (at the left) a stopping point post sign, carrying full information about all the lines passing that point. The view also shows an island platform, which is the rule, not the exception, at European stopping points.

5. A car at Brussels. While advertising is carried at the side of the car, plenty of space is reserved on the hood for route numbering and lettering.



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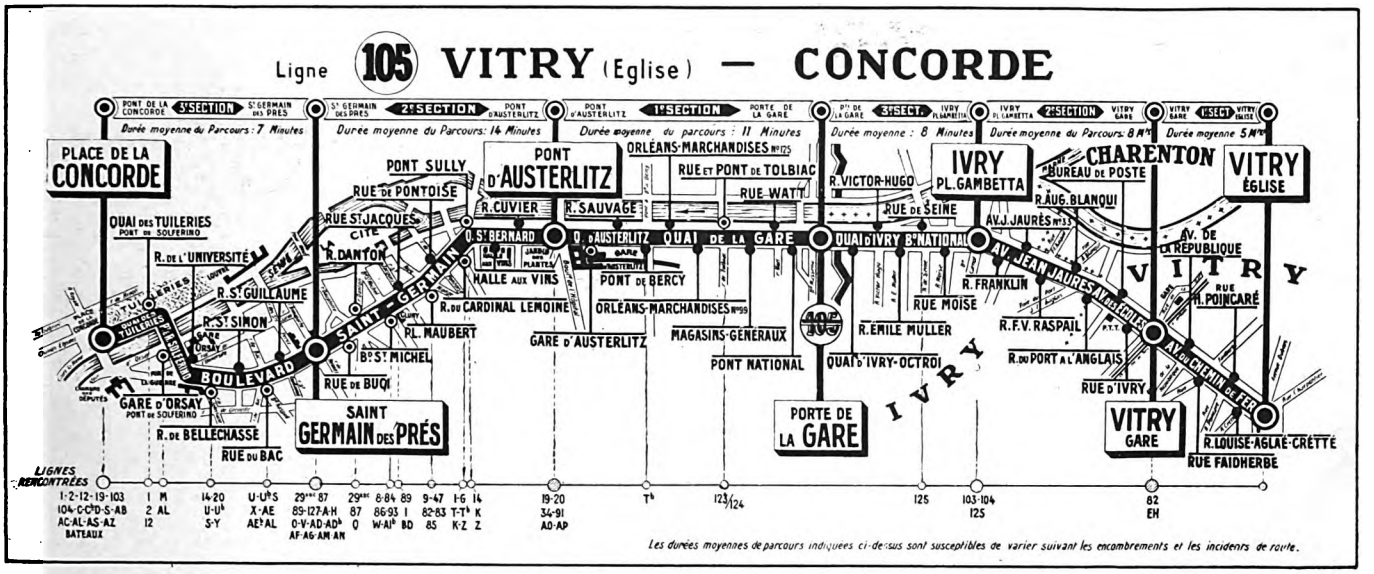

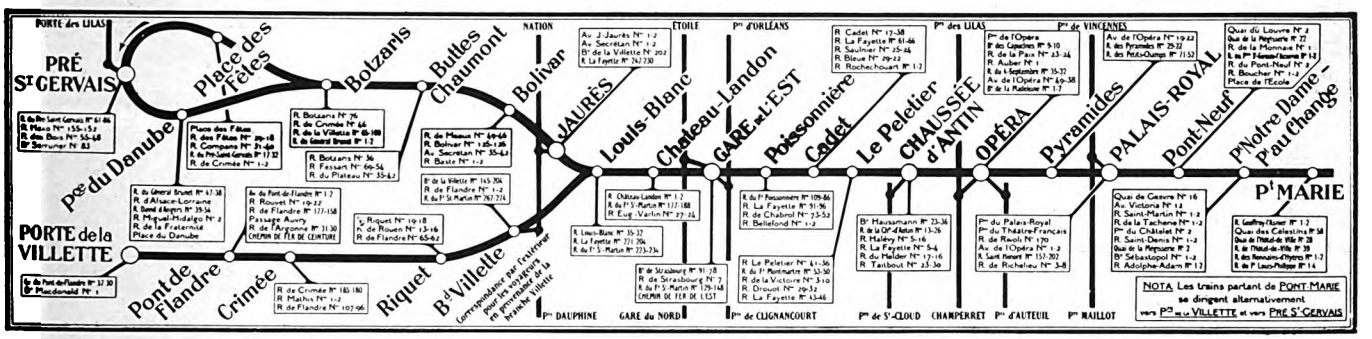

Route maps carried in Paris cars

The information given to the passenger does not stop after he boards his car. He is told the direction in which he is going, the stop at which he must get out to reach his destination, and other helpful information. The upper engraving shows the simple schematic diagram carried on the surface cars in Paris; a similar map is carried on the bus lines. This map gives in addition to the route, the route number, principal streets crossed, fare zones, average time of trip between different points, all connecting bus and trolley lines, etc. The chart below is a sample of one carried on the Paris rapid transit cars. While it necessarily differs somewhat from that carried on the surface lines, as there are no fare sections and a flat rate is charged, it is equally replete with information, showing even the nearest house number on the streets adjoining the subway stations.

In Paris, where both buses and cars are operated by the same company, the car routes are distinguished by numbers and the bus routes by letters, but as there are more bus routes than letters in the alphabet many of the routes have to be distinguished by two letters, like AB, AC, BD, etc.

The method described of route designation by carefully worked-out signs for cars is followed not only by the city railways, bus lines and rapid transit systems but by the steam roads in Europe as well. While the latter do not use route numbers they generously placard their cars with route and destination signs.

Publish Maps and Time-tables Also

The next part of the problem of merchandising transportation by route signs and numbers is to familiarize the public with these numbers and the routes to which they apply. This is done in Europe in several ways. One is to post maps and time-tables of the routes with the numbers marked on them at different places, particularly at the stopping points. Another is to distribute pocket maps of the city with the routes marked on them, accompanied sometimes by supplementary merchandising information, such as a list of interesting places to visit. Sometimes these maps are given away, as by the London Underground, London General Omnibus Company and London County Council Tramways. More often a small charge is made, as 2½ cents in Berlin. In Brussels, Paris and Rome somewhat more pretentious pamphlets are issued, giving besides a map much information about the lines. These pamphlets are sold at a very low price.

The London County Council supplements a plan of issuing maps and time-tables by having at two or three important traffic points a large map known as a "path-finder." On each side of the map are 20 or 30 buttons, each marked with the name of a place which a person might want to reach. When a button so marked is pressed, a row of lamps behind the map illuminates the route to that point. Particulars of this map were published in the issue of the JOURNAL for Sept. 3, 1927, page 395.

Stopping Points Marked

After learning what car he needs to take to go to his destination and the streets on which it runs, the next need of the prospective passenger is to know where he can board the proper car or bus. The points at which cars and buses stop to receive and discharge passengers are farther apart than is usual in the United States. The average distance in Paris is 250 m., or about 6½ to the mile, but an average of 79 continental city companies, quoted in a recent European convention paper, is 375 m., or 1,230 ft., nearly four to the mile.

In every European city these stopping points are very

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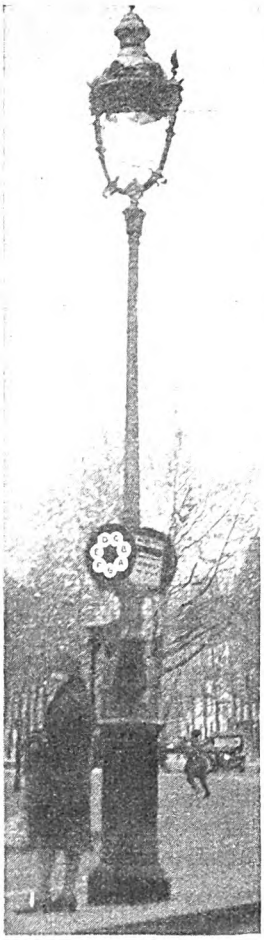
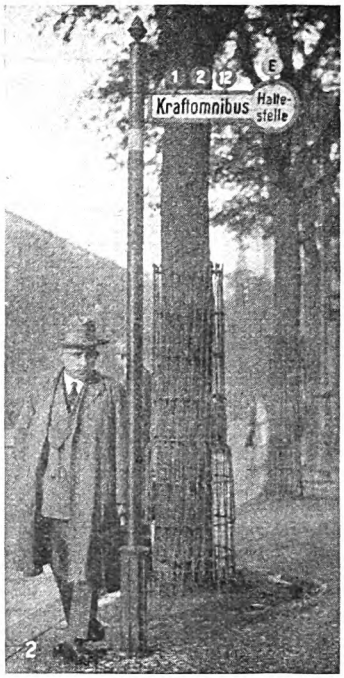
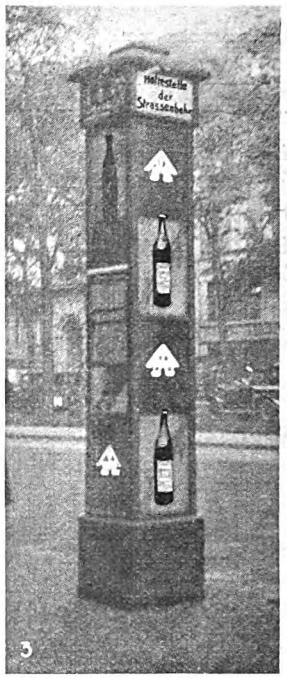






Stop signs and stations in different cities in Europe

1. Stop sign on waiting platform in Paris. The stop sign is cylindrical in form with the letters of the routes passing that point conspicuously displayed.

2 and 3. Bus and street car stop signs in Berlin. Both give the numbers of the lines passing that point. The street railway stop sign takes the form of a square post, on which advertising is displayed besides the information about the car lines passing that point. The sides are translucent, so that the lamps inside make the wording easily legible at night. The advertising on the post illustrated in 3 helps defray the cost of their construction.

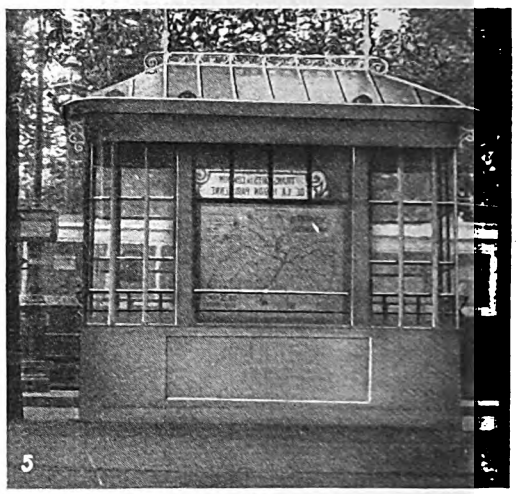
4. Stop signs in Naples, showing optional stops for eleven car lines.

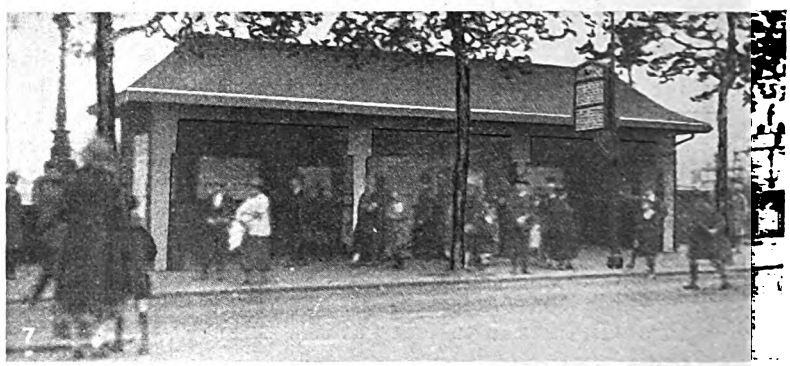
5. Sometimes an attractive waiting station is erected at the stopping point, as at this location on the Avenue de Friedland, Paris. A skeleton map of the system is displayed in a frame, so that passengers can easily select their routes.

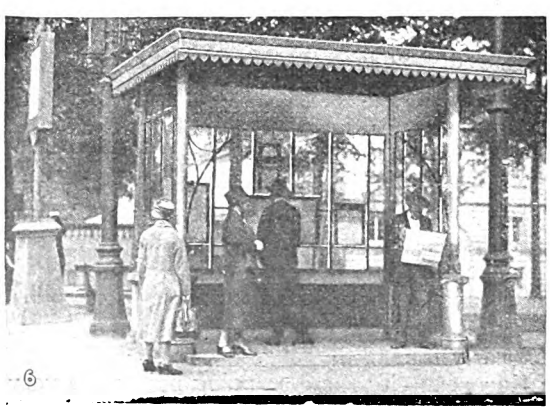
6. A simple waiting station and stop sign on the Avenue de la Toison d'Or, Brussels, quite near the office of the Brussels Tramway Company.

7. Waiting station on the Victoria Embankment near Westminster Bridge, London, for passengers waiting to take the cars of the London County Council Tramways.

8. Waiting station at Place Massena, Nice. Through cars are run from this station to many surrounding points, including Monte Carlo.







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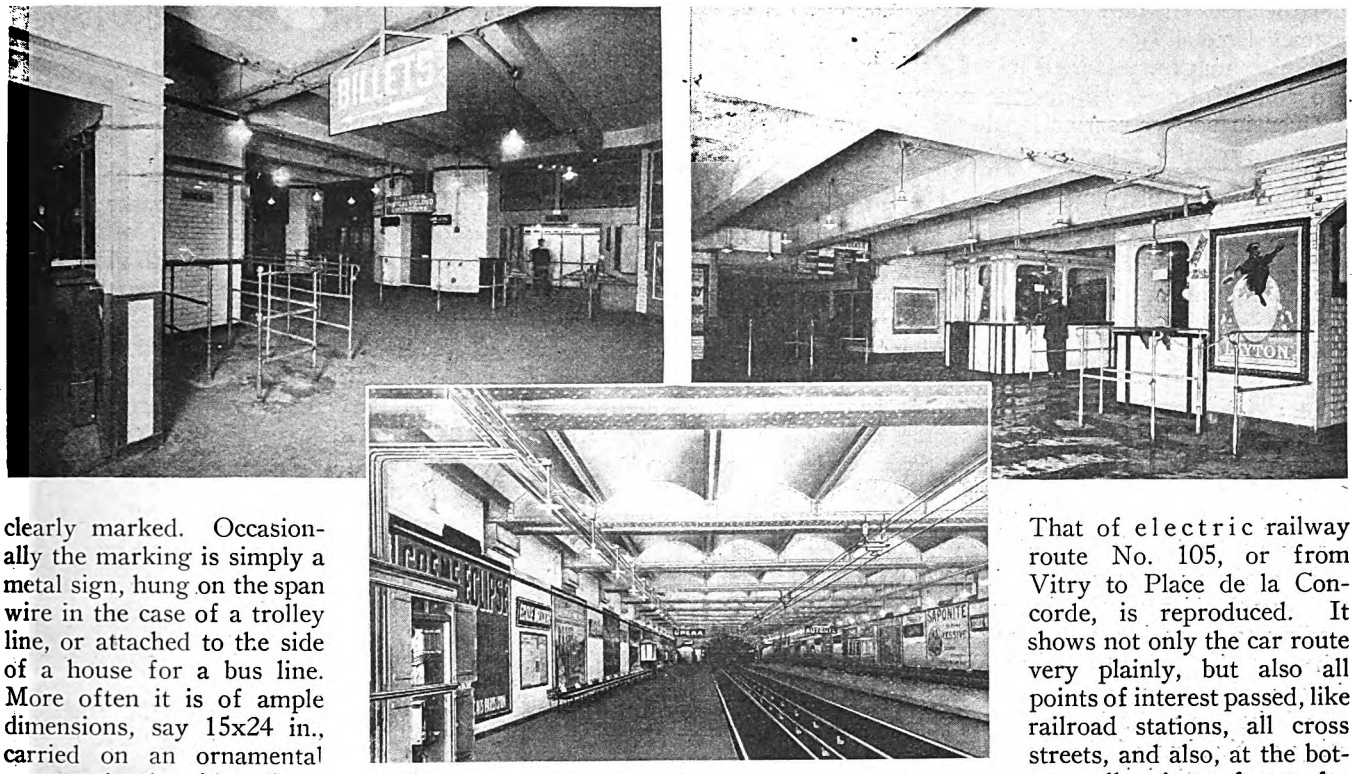


Rapid Transit stations in Paris are well signed

It is practically impossible for any person to go astray in the stations of the Paris subway system. The upper views show ticket booths in two typical Paris stations. The lower view shows a train platform. In the passageway and on the station platform signs give the direction of the trains stopping at that platform, the stations which can be reached by these trains and other data helpful to passengers.

clearly marked. Occasionally the marking is simply a metal sign, hung on the span wire in the case of a trolley line, or attached to the side of a house for a bus line. More often it is of ample dimensions, say 15x24 in., carried on an ornamental post set in the sidewalk or on an island platform. Stopping signs of this kind, as used in Paris, Naples and London and by the Berlin buses, are illustrated.

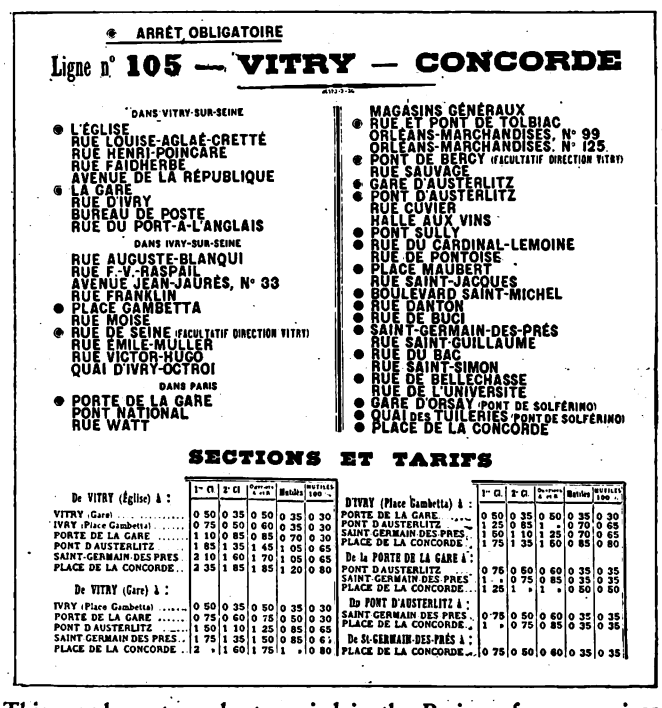
Such signs usually carry a list of the car and bus routes stopping at that point. In Italy and England these route numbers are painted on the board attached to the post supporting the stop sign. In Paris the route numbers are listed on each side of a cylindrical casing containing a lamp so that it can be read at night. The Paris view published is of a stopping point for both electric cars and buses, as shown by the fact that it carries numbers (electric car routes) and letters (bus routes). In Germany the most common form of electric railway stop sign is a built-up post with iron frame and glass sides, about 2 ft. square and 8 to 10 ft. high. The space on this post at about 5 ft. from the ground is given up to time-table and other information about the railway lines passing that point. The rest of the space on the post carries commercial advertising. This post, like the Paris signs, is illuminated at night.

Another feature of European stop points is the large number of raised platforms used. In fact, this type of loading platform is much more common in Europe than in the United States, possibly because heavy snow storms are not frequent in winter in Italy, France, Belgium, Holland and in a good part of Germany. Many of the systems also have waiting shelters at important boarding or transfer points. Views are given of typical stations of this kind in Paris, Brussels and Nice.

Information on the Car Also

European transportation companies do not think their duty of supplying information to the passenger ends when he is safely on the car or bus. He still wants to know where to get out. The Paris companies seem to give the most complete information on this point. Every car and every bus carries a schematic map of its route. That of electric railway route No. 105, or from Vitry to Place de la Concorde, is reproduced. It shows not only the car route very plainly, but also all points of interest passed, like railroad stations, all cross streets, and also, at the bottom, all points of transfer to bus and other street railway routes. The bus routes are indicated on the map by letters such as "AC," "AL," "AF," etc., and the car routes by the numbers.

At the top of the map information is given of the length of time taken in minutes between different points, and the limits of the different fare sections. In addition to this map each car also carries a small poster with somewhat duplicate information, though without a map, such as the streets crossed, those at which stops are made,



● ARRÊT OBLIGATOIRE

Ligne n° 105 — VITRY — CONCORDE

DANS VITRY-SUR-SEINE
- ● L'ÉGLISE
- RUE LOUISE-AGLAÉ-CRETTÉ
- RUE HENRI-POINCARÉ
- RUE FAIDHERBE
- AVENUE DE LA RÉPUBLIQUE
- ● LA GARE
- RUE D'IVRY
- BUREAU DE POSTE
- RUE DU PORT-A-L'ANGLAIS

DANS IVRY-SUR-SEINE
- RUE AUGUSTE-BLANQUI
- RUE F.-V.-RASPAIL
- AVENUE JEAN-JAURÈS, N° 33
- RUE FRANKLIN
- ● PLACE GAMBETTA
- RUE MOÏSE
- ● RUE DE SEINE (FACULTATIF DIRECTION VITRY)
- RUE ÉMILE-MULLER
- RUE VICTOR-HUGO
- QUAI D'IVRY-OCTROI

DANS PARIS
- ● PORTE DE LA GARE
- PONT NATIONAL
- RUE WATT
- MAGASINS GÉNÉRAUX
- ● RUE ET PONT DE TOLBIAC
- ORLÉANS-MARCHANDISES, N° 99
- ORLÉANS-MARCHANDISES, N° 125
- ● PONT DE BERCY (FACULTATIF DIRECTION VITRY)
- RUE SAUVAGE
- ● GARE D'AUSTERLITZ
- ● PONT D'AUSTERLITZ
- RUE CUVIER
- HALLE AUX VINS
- ● PONT SULLY
- ● RUE DU CARDINAL-LEMOINE
- RUE DE PONTOISE
- ● PLACE MAUBERT
- RUE SAINT-JACQUES
- ● BOULEVARD SAINT-MICHEL
- ● RUE DANTON
- ● RUE DE BUCI
- ● SAINT-GERMAIN-DES-PRÉS
- RUE SAINT-GUILLAUME
- ● RUE DU BAC
- RUE SAINT-SIMON
- ● RUE DE BELLECHASSE
- RUE DE L'UNIVERSITÉ
- ● GARE D'ORSAY (PONT DE SOLFÉRINO)
- ● QUAI DES TUILERIES (PONT DE SOLFÉRINO)
- ● PLACE DE LA CONCORDE

SECTIONS ET TARIFS

De VITRY (Église) à :	1re Cl.	2e Cl.	Correspondances	Bustes	Bustes 100 %
VITRY (Gare)	0 50	0 35	0 50	0 35	0 30
IVRY (Place Gambetta)	0 75	0 50	0 60	0 35	0 30
PORTE DE LA GARE	1 10	0 85	0 85	0 70	0 30
PONT D'AUSTERLITZ	1 85	1 35	1 45	1 05	0 65
SAINT-GERMAIN-DES-PRÉS	2 10	1 60	1 70	1 05	0 65
PLACE DE LA CONCORDE	2 35	1 85	1 85	1 20	0 80
De VITRY (Gare) à :					
IVRY (Place Gambetta)	0 50	0 35	0 50	0 35	0 30
PORTE DE LA GARE	0 75	0 60	0 75	0 50	0 30
PONT D'AUSTERLITZ	1 50	1 10	1 25	0 85	0 65
SAINT-GERMAIN-DES-PRÉS	1 75	1 35	1 50	0 85	0 65
PLACE DE LA CONCORDE	2 »	1 60	1 75	1 »	0 80

D'IVRY (Place Gambetta) à :	1re Cl.	2e Cl.	Correspondances	Bustes	Bustes 100 %
PORTE DE LA GARE	0 50	0 35	0 50	0 35	0 30
PONT D'AUSTERLITZ	1 25	0 85	1 »	0 70	0 65
SAINT-GERMAIN-DES-PRÉS	1 60	1 10	1 25	0 70	0 65
PLACE DE LA CONCORDE	1 75	1 35	1 50	0 85	0 80
De la PORTE DE LA GARE à :					
PONT D'AUSTERLITZ	0 75	0 60	0 60	0 35	0 35
SAINT-GERMAIN-DES-PRÉS	1 »	0 75	0 85	0 35	0 35
PLACE DE LA CONCORDE	1 25	1 »	1 »	0 50	0 50
Du PONT D'AUSTERLITZ à :					
SAINT-GERMAIN-DES-PRÉS	0 75	0 50	0 60	0 35	0 35
PLACE DE LA CONCORDE	1 »	0 75	0 85	0 35	0 35
De St-GERMAIN-DES-PRÉS à :					
PLACE DE LA CONCORDE	0 75	0 50	0 60	0 35	0 35

This supplementary chart carried in the Paris surface cars gives all stops, fare section limits, fares and other information

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and the rates of fare for the several sections. It is of enameled metal.

Similar maps are carried in the Paris buses. In London full information about the route and rates of fare is given in posters carried inside the buses and cars, but maps are usually not included.

Station Indicators of Rapid Transit Lines

The rapid transit lines are as thorough in signing their stations and cars as are the surface lines. Indeed, the information given is even more elaborate than on the surface lines because an alighting passenger is less able to identify the point where he may happen to be by his surroundings.

In Paris, every station has its name prominently displayed in several places and also the direction of the trains passing each platform. The direction is indicated by naming the terminal station. Many stations are transfer points, and where this is the case and the passenger walks from one station to another, the passageways are very clearly marked. A recent improvement has been the introduction in a number of the passageways leading to a station of an automatic gate which closes when a train is about to enter a station. In this way the danger of passengers arriving late and attempting to board the car while in motion is prevented. The operating mechanism of this gate is an electric motor with worm gear and pinion. Passengers are warned by a sign not to attempt to pass through to the station platform while the gate is closing. After the train has left the platform the gate opens automatically.

Paris has only one route on which there are any branch terminals. Hence, there is little need for changeable platform route indicators. However, these have been developed to a marked degree on the London Underground lines. The latest form is the indicator at St. James Park Station, illustrated on page 1151. Here fifteen routes are indicated on the indicator board and illuminated numbers show in advance of the arrival of each train the destinations of the next three trains. With such definite information before him it is hardly possible for any underground railway passenger to go astray.

Rapid Transit Cars Also Carry Maps

All rapid transit cars in both Paris and London also carry maps. One of those used in Paris is reproduced, as it is somewhat different from the form of map used on the Paris surface cars and buses.

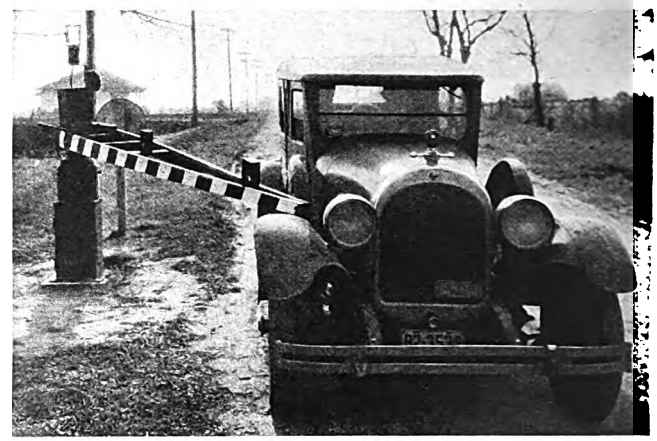
Two of these maps are carried in a frame in the center of the car back to back so that they can be seen by passengers in all parts of the car. The route shown is No. 7, in the form of a "Y." The heavy line shows the route, the cross lines, printed red on the map, show connections. The lettering in the panels at each station gives the names of the streets close to that station, with the nearest house numbers. On the outside of the train, the direction is shown not only by light markers but by lettered signs on the front and rear ends of the train, by lettered signs on each car, so placed that they can be read from the platform and by color markers inside the car similar in color to those on the ends of the car. All of this is in addition to elaborate lettering and illuminated signs on the platform.

On the London rapid transit lines much the same system of illuminated maps with supplementary printed lists of stops for use within the car is followed. Hamburg goes a step further on its rapid transit system and paints a map of the route on the ceiling.

Automatic Crossing Gate Developed by North Shore Line

ELECTRIC highway crossing gates which are lowered automatically by the approaching train itself by completing a track circuit have been in operation without a single failure for more than two months on the Wheeler Road crossing of the Chicago, North Shore & Milwaukee Railroad, near Libertyville, Ill. The gates were installed as an experiment and are proving even more reliable than those operated by hand.

There are two gates, 10 ft. long, operated by electric motors. They are placed on the traffic sides of the highway approaching the crossing and are equipped with warning bells and red signal lights. Two signal relays are sufficient to operate them. The track circuits



The gate is flexibly supported so that it is swung aside by an automobile without damage, afterward returning to its normal position

controlling the gates can be extended to any distance away from the crossing. Warning can be given at least 35 seconds in advance of a train at the highest speed operated. At this particular location the circuit is completed by approaching trains when 2,200 ft. from the crossing.

The approaching train operates the relays, which start the warning bell and the signal lights at from eight to ten seconds before the gates are lowered. Should an autoist fail to regard the signals and crash into the gate the impact would not damage the gate, but would swing it around parallel to the road. Springs in the upper case of the gate posts provide for such emergencies. The gates would not be in the path of the train as their base is set back far enough from the track. After the automobile passed the gate would swing back to its normal position. The gate mechanism would not be injured should the gate drop directly on an automobile, as it has sufficient slack in its parts to relieve the strain on its motor. The danger of a failure is reduced to a minimum as the track circuits employed are the same as the standard signal circuits.

For the purpose of accurate tests, the relay box is now equipped with a needle indicator, having a chart graduated into fifteen-minute periods. It is operated by six dry cells and is connected with a mercury tube on the gates. When the gates are lowered the mercury closes contacts and completes a circuit which operates the indicating needle on the chart. Thus a record is kept automatically of the time each train passed and

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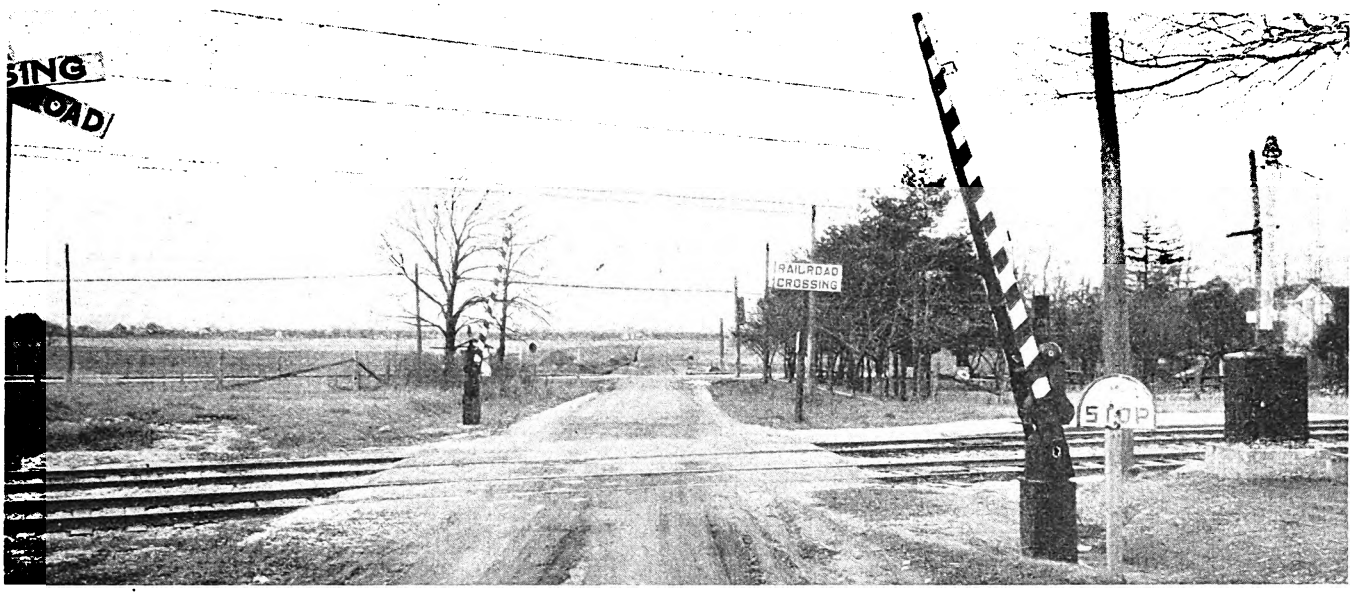
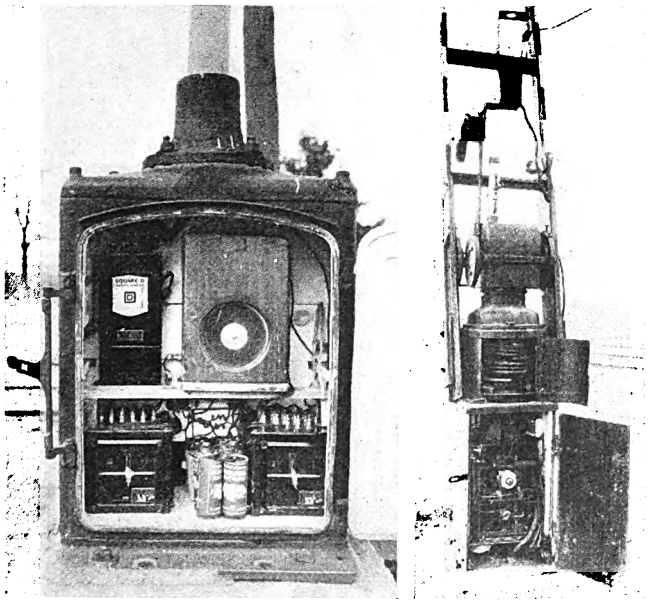


Automatic gate at the Wheeler crossing on the North Shore Line in normal position. It is lowered by a motor on the base controlled by a track circuit

whether or not the gates functioned at that time. A signalman needs to make but one trip in 24 hours to change charts and inspect the gates.

W. G. Fitzgerald, signal supervisor, is planning for a reserve source of power to be used in case of emergency. The gates are now operated by commercial alternating current. Should a failure occur on the a.c. circuit operating the gate motors, due to lightning or other causes, a power-off relay, operated by direct current from the trolley, would instantly set signals against approaching trains. The actual failure of the a.c. circuit itself would cause the power-off relay to set signals against trains.

Although still in the experimental stage, the new gates give promise of solving the old problem of furnishing crossing protection without the risk of the uncertain "human element" and without the prohibitive cost of elaborate automatic gates. Various forms of this gate have been used before by other railroads, but they necessitate manual operation. It is believed that the North Shore Line is the first to use this particular type of automatic gate.



At left, interior of relay box, showing both relays, the indicator and its batteries. At right, interior of the gate post for the automatic highway crossing gate. Below is the motor operating the gate; above are the springs which allow the gate to swing sideways when struck by a vehicle

Twenty-one Waiting Stations for Passengers in St. Louis

LOCATED at various points on the property, the St. Louis Public Service Company now has 21 combined shelters and refreshment stands, according to the brief submitted by it for the 1927 Coffin Prize. They are in the outlying districts, as well as at the more important intersections and transfer points where passengers are apt to be waiting for cars, and are built on company property.

They were built under the late receivership and after one station, so established as an experiment, had proved successful. This station was erected at the terminus of one of the lines where the company had maintained an open shelter of the sort usually found along electric lines in such districts. To improve this condition it offered ground at a reasonable rental on which the lessee was to erect at his own expense a modest structure where coffee, soda, beverages, confections and tobacco could be sold and space would be provided for a waiting room for passengers. The building to be erected by the individual remained his property and the lease stipulated that on termination of the lease the lessee would remove the building and replace the property in the same condition as he found it. In other words, the company was to furnish the customers for his business and in return he was to furnish, at his expense, the quarters to shelter the passengers as well as his own electric light, water and heat. In many of these buildings the tenant also furnishes the toilet facilities.

Arrangements like these now not only provide the 21 waiting stations for passengers mentioned but also bring in an income to the railway company from ground rentals of about $4,000 per year without any expense whatsoever to the receiver. The leases are drawn for a short period only and may be terminated by the receiver at any time that the ground may be needed for other purposes.

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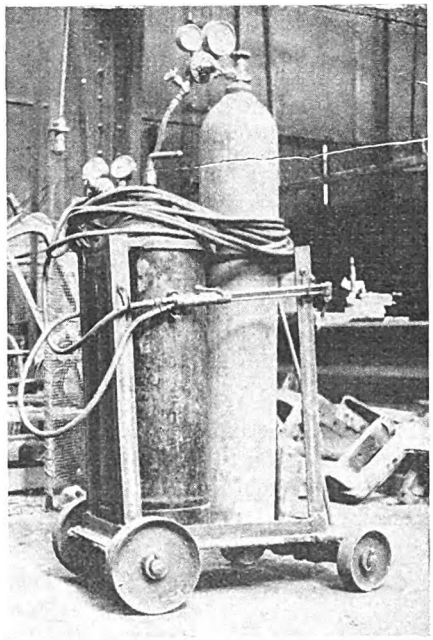
Maintenance Methods and Devices

Truck for Welding Outfit

DUE to the accidental destruction of the hand truck purchased originally with the oxyacetylene outfit used in the Woodside shop of the New York & Queens County Railway, New York City, it was found necessary to construct immediately another truck in order that the welding work would not be delayed. The truck shown in the accompanying



This truck was cheap to construct and has given excellent service

illustration was designed to meet this emergency. It was built out of standard structural shapes easily obtainable.

The platform of the truck is made from a solid piece of ½-in. plate, 30 in. long and 16 in. wide. Square axles made of 2-in. stock are equipped with rear wheels of 10 in. diameter and 2 in. face and front wheels of 7 in. diameter and 2 in. face. The wheels are spaced at 20½-in. centers and the axles 22-in. centers. The rear axle is bolted to the platform and the front axle to a horizontal round plate which makes contact with a similar plate fastened to the platform. This provides a swivel bearing for free circular movement. Four pieces of 2-in. angle are welded to the platform, forming a base structure 25 in. long and 13 in. wide. A 2-in. angle 25 in. high is welded to each corner of this base. These four angles are reinforced by a ⅜x2-in. flat bar welded to the top of the uprights on the 13-in. sides and two ½x1-in. flat bars shaped to fit the contours of the truck and welded to the uprights on one of the 25-in. sides. A ⅜x1-in. bar shaped to fit the truck is placed on the other 25-in. side. This fits into clips and is removable to allow for the replacement of the ¼-in. round iron hook installed on the front uprights which provides a support for the truck when not in use. For easy transportation of the truck there is a handle 4 ft. 6 in. long and made of ¾-in. round iron.

Speaking of "canned heat"—tie a can on your hot bearings and make it a full oil can.

Cleaning Systematized at Los Angeles

CAR trucks, together with various fittings, are cleaned carefully during overhauling at the shops of the Los Angeles Railway, Los Angeles, Cal. For preliminary removal of dirt and grease, a mixture of cleaning solution with steam under pressure is sprayed over the trucks before the parts are dismantled. This is much quicker than the old method of scraping off the grease by hand.

All journal, axle and armature bearings are cleaned before going to the babbitting shop for rebabbitting. A tank 2½ ft. x 3 ft. x 5 ft. is used for small parts which can be handled without the use of a crane. The cleaning solution used in the tank comes in a powdered form and is mixed in a proportion to give desired results.

A larger tank 3 ft. 2 in. x 5 ft. 8 in. is used for large, heavy parts such as motor frames, gears and complete rear ends of buses. Nuts, bolts, trolley wheels, washers, journal and axle bearings and other small parts are placed in a heavy wire mesh basket and lowered into the tank.

The three tanks used in connection with this work are heated with steam radiating coils of sufficient size to bring the solution to the boiling point in about 30 minutes. Parts are left in the tanks from 30 minutes to three hours, depending on their condition.

Setting Poles Under Heavy Traffic Conditions

By R. M. Cobb
Construction Foreman Electrical Department, Pacific Electric Railway

UNDER very heavy traffic conditions a total of 79 poles were set in less than three days by forces of the Pacific Electric Railway on Ocean Avenue, Long Beach, Cal. Owing to the location, it was necessary that the poles be in true vertical position after the load of span attachment was applied.

The resulting strains on the poles due to the weight of the overhead construction were predetermined. With this quantity known the rake at which the poles were to be set for different span lengths was calculated and a curve was plotted for use of the line crews. The spans varied in length from 90 to 135 ft. and in consequence it was necessary to set the poles at different rakes for the different span lengths, so that when the load was applied the rake would just offset the normal deflection due to the load.

Holes for the poles 3 ft. square were dug by hand for the first 2 ft. Then the remaining 4½ ft. was dug by a machine in a circular form with a diameter sufficient to allow 6 in. of concrete between the base of the pole and the outside of the hole.

Special pike poles were used to line up the poles. The ones used consisted of a piece of round wood about 3½ in. in diameter and 12 ft. long, on the end of which was an iron fork, the tines being bent to a diameter slightly larger than the pole. These tines were covered with friction tape to prevent slipping.

Blocks were placed in the bottom of the hole far enough apart to catch the weight of the pole and still allow the drainage necessary to prevent accumulation of moisture and consequent deterioration from rust.

When the hole was ready the pole, 40 ft. long and weighing nearly 2,000 lb., was raised by a derrick and placed in the hole ready for alignment. In raking the poles against the span strain a 5-ft. straight edge was placed on the front side of the level with a graduated screw adjustment. This was used to obtain the proper

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rake as was indicated on the plotted curve used by the crew. A variation of 0.1 in. in 5 ft. was obtained on some poles. This small variation was due to the small difference in length of span and consequent amount of weight support.

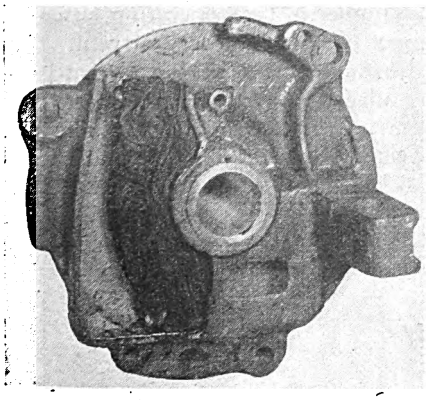
When the poles were raked properly the ells for street lighting conduits were placed by means of templets and the remaining excavation was filled in with concrete of a 1:2:4 mixture. About 1 cu.yd. of concrete was required for each hole.

Before taking the pike poles away it was necessary to support the pole in some manner to prevent the weight moving it out of alignment. This was accomplished by driving a wedge on the back side of the pole at the sidewalk line.

Proper Method of Packing Bearings

By Jesse M. Zimmerman
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

PROPER packing of bearings has an importance seldom appreciated. Bearings are often placed in service with improper packing. The function of the waste wick is to provide a direct path from the oil chamber to the window. When packing bearings the following points should be observed carefully:



Armature bearing housing with waste chamber cut out to show proper method of packing

1. A wick should be prepared from a good grade of long strand wool. This wick should be long enough to reach from the bottom of the oil chamber to the top of the waste chamber and should be wide enough to cover perfectly the entire area of the window.

2. The wick should be placed in the waste chamber so that it will reach from the bottom of the oil chamber and cover the entire window.

3. A sufficient quantity of waste should be tamped behind the wick, using care to force the wick firmly against the journal in the window.

4. A separate wad of waste should be placed on top of the main body of the waste to keep the dirt out.

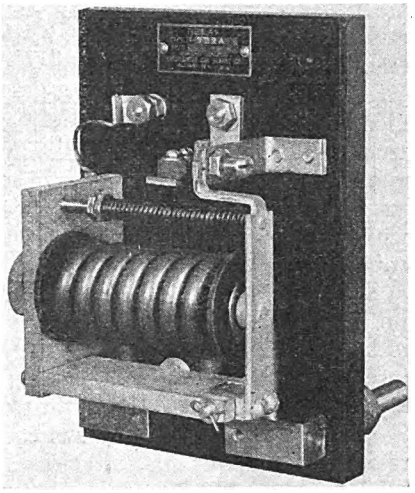
New Equipment Available

Motor Resistor Heater

CURRENT taken by car motors during acceleration is used for heating the interior of cars by means of a motor resistor heater just announced by the Consolidated Car Heating Company, Albany, N. Y. The heater shown in the accompanying illustration has one motor resistor heater unit and one standard sheath wire heater unit, mounted in the same casing. The motor resistor heater unit consists of an element containing a nichrome wire resistor embedded in insulating powder. This is subjected to a swedging process, whereby the outside diameter of the pipe is reduced, thus compressing the insulating material into a solid mass. Cast on the outside of the pipe is an aluminum fin to provide ample radiating surface for the heat generated within the resistor. This unit is secured to the heater by suitable clamps, one of which is a slip connection to allow for expansion and contraction of the element. The heavy lead wires are carried through the ends of the heater by porcelain bushings.

The motor resistor heater is an entirely new development in car heating and makes possible great economy in the use of current. The new and important function of the heaters is to remove the regular heater load from the peak load, and at the same time contribute a portion of the heat necessary to heat the car.

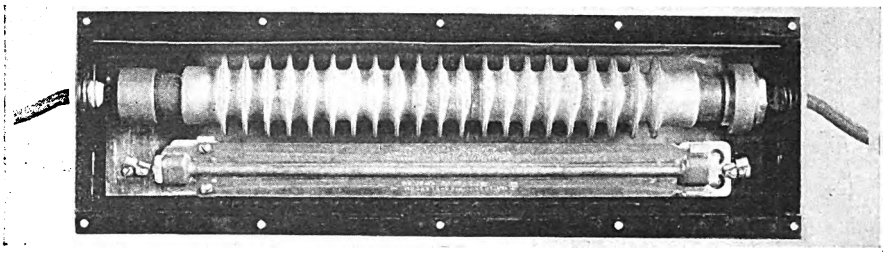
These heaters provide the resistance for the motors and have the same values as the external resistance mounted underneath the car, which is used in the summertime. Transfer from the inside to the outside resistors is made by means of a transfer switch. A peak load relay is in the resistor heater circuit. When the motor resistor heaters are operating, that is, when the car is being operated with the resistance in the motor circuit, the peak load relay is energized and short circuits the magnetic



Relay used to cut out car heaters when motor resistor heater is used

switch controlling the regular heaters, thus cutting them out. If the temperature of the car is below the temperature at which the thermostat cuts the heaters out, they will come into service again automatically as soon as the car motors cease to run on resistance.

The two sets of heaters are never in operation at the same time. The regular car heaters are cut out when the motor resistor heaters are operating, and they will be operating at all times when the motor resistor heaters are not operating, except when they are cut out by their thermostatic control. This effects a saving in two ways. First, by taking the normal heater load off the peak load of the car and consequently off the peak load



The regular heater spindle is shown at the top and the motor resistor heater unit at the bottom

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of the power house; second, by supplying heat during the time that the regular heaters are cut out. This supplementary heat reduces the amount of current the regular heater equipment would take if the motor resistor heaters were not used. In other words, the peak load is reduced and the hourly consumption of electric heaters is also reduced.

The motor resistor heater shown in the accompanying illustration is of the panel type, but these heaters are also furnished in cross-seat and truss plank designs.

The safety heater switch used in connection with this equipment contains the fuses and cannot be opened when the switch is closed. Furthermore, the switch cannot be closed when the box is open. The switch mechanism is of the toggle type, with magnetic blowout, and a heavy barrier protects the fuses. The movement of the switch is such as to provide a good wipe at the contacts. An important feature of the construction is that the switch blade is thrown mechanically when it is opened. It is therefore impossible for the switch to remain in when the handle is thrown to the off position. These switches are furnished in various capacities up to 75 amp. at 600 volts. They are neat in appearance and every part is substantially constructed to withstand hard usage.

Run down brakes—
Break up cars.

Machines for Undercutting Commutator Segments

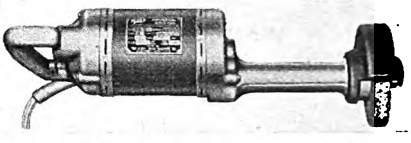
FOR undercutting mica between commutator segments of railway motors two machines have been introduced recently by the General Electric Company. One is a simple portable outfit which can be moved readily to any part of the shop and clamped to the armature shaft; the other is a stationary shop tool.

The portable outfit has adjustable stops which limit the travel of the saw to the brush surface of the commutator and is equipped with a floating drive shaft which permits the grooving of a number of slots at one setting of the armature. It also has an angular adjustment to compensate for commutator bars not exactly parallel to the shaft. A slight tap with the hand readily shifts the saw from slot to slot as the clamp is lined and will not mar the armature shaft. The driving shaft is equipped with universal toggle joints and can be furnished for either belt or motor drive.

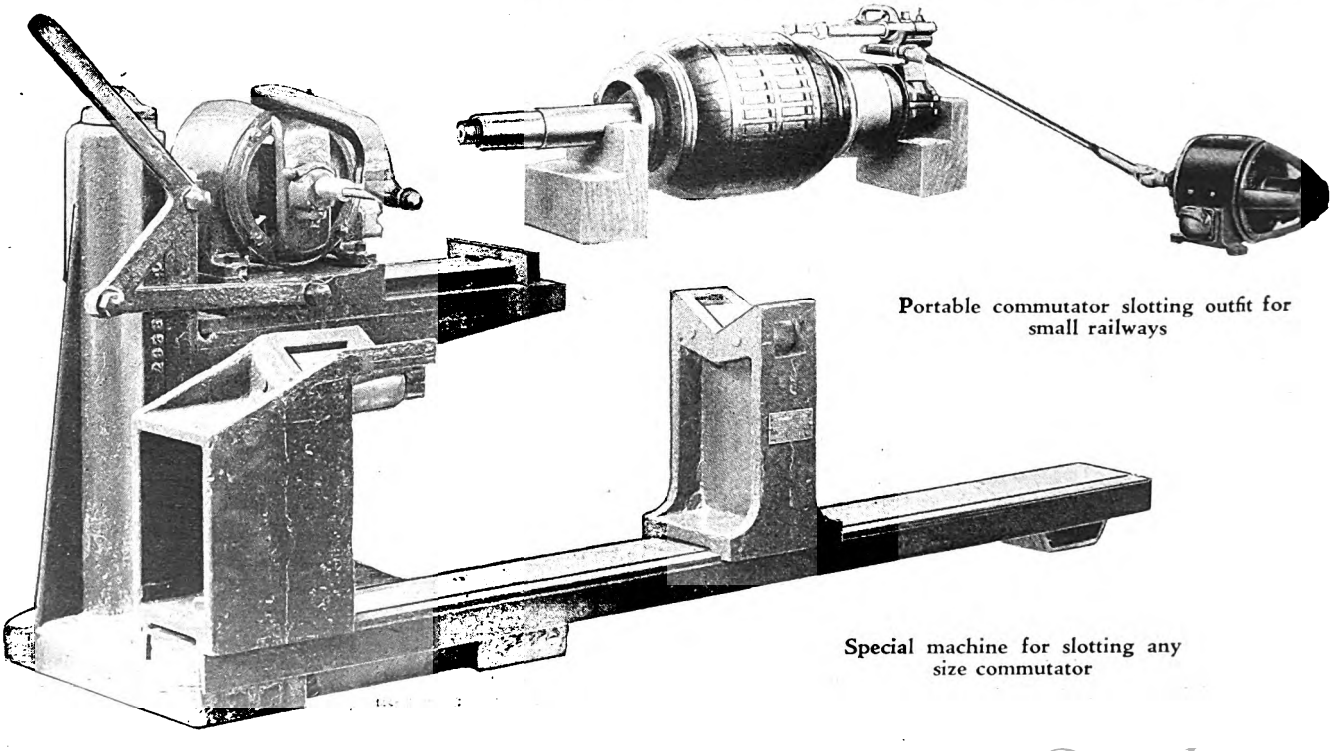
The stationary machine has a base which is provided with adjustable pillow blocks having V-shaped bearing surfaces with brass rollers for carrying the armature. Both vertical and angular adjustments are provided, the latter adjustment to be used where the commutator bars are not exactly parallel to the shaft. The circular saw is mounted on the end of the motor shaft and is supported by an offset bearing, which permits the grooving of commutators having ears. Hand scrapers are designed and shaped to remove the fins on the mica insulation, also burrs and sharp corners on segments which are left in the grooves by the slotting machine. This work is done by drawing the tool along the slot after the commutator has been smoothed off by a No. 3 Stellite machine cutting tool. The commutator should be given a final polished finish with sandpaper and blown clean.

Portable Grinder and Buffer

BALL BEARINGS for the motor and roller bearings for the grinding spindle are features of a ½-hp. portable grinder and buffer just announced by the Hisey-Wolf Machine Company, Cincinnati, Ohio. This tool is equipped with the new Hisey two-pole switch which provides convenient control at the grip handle. The ½-hp. motor, constructed especially for heavy-duty service, is of the universal type operating either on direct or alternating current. An adjustable cast-steel wheel guard can be placed at any angle most convenient for the operator. The end cover is readily removable and affords quick renewal of grinding wheels.



One-half horsepower portable grinder and buffer



Portable commutator slotting outfit for small railways

Special machine for slotting any size commutator

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American Association News

1928 Convention Goes to Cleveland

Selection made by policy committee after carefully weighing the possibility of completion of new convention hall at Atlantic City. Adequate car exhibit next fall considered vital to industry

CLEVELAND was again selected as the location for the annual convention of the American Electric Railway Association, which is to be held during the week of Sept. 22-28, 1928. This decision was reached at a joint meeting of the policy committee and the sub-committee on convention contract held at association headquarters in New York on Dec. 16.

The decision was made only after the fullest investigation, study and discussion by the several committees which have had the matter of plans and location for the 1928 convention in hand. There was a considerable sentiment in favor of Atlantic City as the convention location, attributable largely to the natural attractions of the seashore resort. There was, however, grave doubt as to the wisdom of selecting the next convention location on the basis of Atlantic City's general popularity, with no definite assurance of the completion of the new convention hall there and particularly in view of the assured superior facilities in Cleveland for a representative exhibit of progress in cars and equipment. Such an exhibit, it was felt, is of vital importance at the present time because of its influence in stimulating the recovery and rehabilitation of the industry.

The committee had great doubt as to the actual completion of the new Atlantic City exhibit hall in time for the 1928 convention. Even if the actual construction work were completed by close adherence to the best possible schedule, the task of staging a large convention, such as that of the American Electric Railway Association, immediately after the completion of actual construction work would be attended with many difficulties and complications, jeopardizing the success of the convention. The occurrence of any unexpected delay in the construction program, on which there is still a large amount of work to be done, might easily delay completion of the new hall in Atlantic City until after the 1928 convention date. The substitute facilities available, in the event this should happen, were not considered satisfactory by the committee, and it therefore decided that the best interests of the industry and the association dictated the selection of Cleveland again for the next convention.

J. H. Alexander, president Cleveland Railway, and L. C. Dickey, manager of the Cleveland Public Auditorium, described the new facilities which will be available in that city next fall. New wings have been added on the north and south ends of the auditorium and a new entrance has been arranged. A number of large and attractive meeting rooms will be available in the new wings, and it will therefore be unnecessary to use any part of the annex for meeting rooms as was done in previous years.

Action of the joint meeting of the policy committee and the sub-committee on convention contract in selecting the convention location completes the preliminary work for the next convention which was taken up immediately after the last Cleveland meeting. The committee on convention location held its meeting in November, when it was decided that the 1928 convention would include exhibits. This committee also set the date for the last week in September. At that time, options expiring Jan. 1 were secured on the Cleveland Public Auditorium and on the new auditorium in Atlantic City. Because of the uncertainty then existing regarding the date for completion of the Atlantic City building final choice between Atlantic City and Cleveland was left to the policy committee. Since the meeting of the latter was held only a short time before the expiration of options, it was impossible to delay decision until more definite assurance of the completion of the Atlantic City building could be obtained. A delegation headed by A. H. Skeen, manager of the Atlantic City Convention Bureau, outlined the situation regarding the facilities there, and a separate report was made to the committee by independent engineers who had made a study of the building operations. The committee made its decision after full investigation of the Atlantic City and Cleveland proposals.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 6 — **Metropolitan Section, A. E. R. A., Engineering Societies Building, 39 W. 39th Street, New York, N. Y., 8 p.m.**

Jan. 16-17—**Midwest Electric Railway Association, Hot Springs, Ark.**

Jan. 18-19—**Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.**

Jan. 18-19—**Central Electric Traffic Association, Hotel Gibson, Cincinnati, Ohio.**

Jan. 25—**Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.**

Jan. 25-27—**Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

Jan. 26-27—**Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.**

Jan. 31—**New York Electric Railway Association, annual meeting. Hotel Commodore, New York, N. Y.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention, Cleveland, Ohio.

Rail Corrugation

RESULTS of a study of wheel-rail contact pressures were presented at a meeting of way and structures committee No. 12 on rail corrugation held at association headquarters, New York City, on Nov. 28. Data for these studies were secured by permitting one wheel of a car to run over a strip of manila paper. A relation between paper thickness and compressing force was established by some tests in a compression testing machine. The study showed that even with new rails and car speed of 10 or 12 m.p.h. the wheel-rail pressures are likely to vary between ranges of the order of one to four.

As to the corrugraph data on the track sections which are now under observation it was decided to secure three more sets of corrugraph readings: One set to be taken before the first of the year, another set early in the spring and a last set some time in June. With reference to the analysis of these data it was decided that it should await the June collection of data.

In the remaining work on the sections which are now under observation it was suggested that pains be taken to observe:

1. If the corrugation waves, where both rails are corrugated, have their crests opposite each other or whether a crest on one rail is opposite to a valley on the other rail.

2. The rate of growth of corrugation, if such a thing as growth exists, along the rail in both directions.

With reference to experimental track sections it was suggested that committee members representing operating com-

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panies should, when it is feasible to do so, in building new track or reconstructing old track, try out the various mitigating methods suggested in the report of the committee for last year. Among the mitigating methods suggested were tilting of the rails to secure a more uniform wheel-rail contact, planing of the rail head at the mill, grinding of the rail surface after the track is constructed but before cars are operated over it.

Attention was called to the fact that the Pittsburgh Railways is building some track with planed rails.

Mr. Williams suggested taking up some of the rails in a section which now corrugates badly and rebuilding the track following the several suggestions for corrugation mitigation.

Mr. Wysor suggested building a toy or small scale experimental railroad for investigation purposes. This matter was discussed at some length but no formal action relative to it was taken. It was suggested that the secretary request Messrs. Lavan, Fehr and Nardini to look over the resilient track which is being tried out in Denver in case they happen to visit the Denver property.

Mr. Ormondroyd reported that with the co-operation of the Pittsburgh Railways he had made some observations on track deflection, but as these observations were not very satisfactory he is planning to secure a second series of deflection readings. He also reported on some tentative calculations on track and rolling stock vibration periods.

The secretary also reported some data secured from vibration calculations.

It seems from the work so far done that both vertical and torsional vibration frequencies come within the zone of frequencies likely to assist in the production of corrugation.

From the calculations so far made it does not appear that the gyroscopic action of the wheels is an important contributing factor.

The foreign committee's report relative to improvement of rail quality was discussed at some length.

In the matter of the rails, now in the track on Jefferson Avenue, Detroit, where the rails from one mill show a markedly greater tendency to corrugate than the rails from another mill, Mr. Williams agreed to prepare tension specimens according to A.S.T.M. specifications for Mr. Ormondroyd, who agreed to have them tested for total work of rupture in the testing laboratories of the Westinghouse Electric & Manufacturing Company. Mr. Williams agreed to furnish data relative to temperature variations of rails laid in paved track.

It was agreed that the chairman write Mr. Dalgleish, president of the Engineering Association, relative to the project and suggest that at least three more equipment men be appointed on the committee.

In connection with Mr. Fehr's suggestion of vibrograph studies on track over which new and present types of cars are operated, Mr. Ormondroyd agreed to make such studies as soon as the Pittsburgh Railways places its new cars in operation.

It was agreed that oscillographic studies of vibration of both track and rolling stock are advisable and that the committee attempt to secure the use of a suitable instrument.

The secretary presented the results of a study of wheel-rail contact pressures.

It was decided that another meeting of the committee should be held about May 1, 1928.

Members present were W. W. Wysor, chairman; C. H. Clark, H. J. Tippett, H. S. Williams, C. R. Kinnear, A. M. Nardini, J. Ormondroyd and D. D. Ewing.

Rectifier Committee Outlines Work for Year

SPECIAL committee No. 2 of the power division on mercury-arc rectifiers held its first meeting of the year at association headquarters, New York City, on Dec. 7.

After discussing the 1927 report on the subject of rectifiers, which was prepared by a sub-committee of the power generation and conversion committee, the committee decided to conduct its work for the present year on the following lines: (1) It will attempt to set up definitions and standards which will serve as a means of crystallizing the ideas of the committee members. (2) The committee will send out a questionnaire to bring up to date the information on rectifiers which was obtained by last year's committee. (3) The committee will keep in touch with all phases of the situation, putting special emphasis on new developments in design or operation.

Considerable time was devoted to the preparation of certain definitions of rectifier terms to be used in this work and in the preparation of its report. The committee agreed to include in this year's report another list of all rectifier installations.

Those who attended the meeting were H. W. Codding, chairman; C. E. Baker representing F. W. Peters, C. A. Butcher, C. L. Doub, W. S. Richhart and G. C. Hecker.

Accountants' Executive Committee Meets

TWO reports, one by Leslie Vickers, on the status of the depreciation hearing in progress in Washington, and the other by the association's representative at the recent Railroad and Utilities Commissioners' convention, were made at the Nov. 18 meeting of the Accountants' executive committee meeting, held at Pittsburgh, Pa.

The committee voted to invite J. H. Hanna, chairman committee on national relations, and Dr. Thomas Conway, Jr., chairman sub-committee on depreciation, to become members of the committee on standard classification of accounts, and announced the personnel of the joint committee on engineering accounting, as follows: L. T. Hixson, chairman; F. A. Healy, T. P. Kilfoyle, C. R. Mahan and Walter Shroyer.

Those present at the meeting were T. B. MacRae, president; J. E. Heberle, C. R. Mahan, E. A. Tuson, L. T. Hixson, J. W. Welsh, M. W. Glover and Leslie Vickers.

Way and Structures

LAYING out and planning work for the coming year constituted the principal business of the way and structures committee at a meeting held at association headquarters, New York City, Dec. 8. Those present were: H. H. George, chairman; C. A. Alden, C. W. Burke, C. H. Clark, W. R. Dunham, Jr., E. D. Eckroad, E. B. Entwisle, C. F. Gailor, W. G. Hulbert, Adrian Hughes, Jr., E. M. T. Ryder, C. A. Smith, A. T. Spencer and H. M. Steward.

In considering the specifications and standards now included in the Engineering Manual, the committee called attention of the chairman of special committee No. 1 to the advisability of considering advancing the classification of some of the specifications to that of standard.

Special committee No. 2 on trackwork held a meeting and decided on crossing designs for steam over electric railways. It was recommended that these be approved by letter ballot.

News of Other Associations

A.I.E.E. Nominations Announced

NOMINATIONS for the general officers of the American Institute of Electrical Engineers have been made by the national nominating committee. Election will be by letter ballot and the results will be announced at the annual meeting. The officers so elected will go into office on Aug. 1, 1928. The nominations follow:

For president, R. F. Schuchardt, electrical engineer Commonwealth Edison Company, Chicago, Ill.

For vice-presidents:

Northeastern district, E. B. Merriam, Schenectady, N. Y.

New York City district, H. A. Kidder, New York, N. Y.

Great Lakes district, W. T. Ryan, Minneapolis, Minn.

Southwestern district, B. D. Hull, Dallas, Texas.

Northwestern district, G. E. Quinan, Seattle, Wash.

For managers: A. E. Bettis, Kansas City, Mo.; J. A. Johnson, Niagara Falls, N. Y., and A. M. MacCutcheon, Cleveland, Ohio.

For treasurer: George A. Hamilton, Elizabeth, N. J.

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News *of the* Industry

Authority for Subway Routes in Chicago Settled

As a result of the settlement of all differences between the City Council of Chicago, Ill., and the Board of Local Improvements in the question of authority in determining the location of the tubes, a matter which has delayed action for several weeks on the subway bill, the fifth and last of the railway enabling bill, this measure was approved Dec. 8 and copies of the bill forwarded to the companies. At a joint meeting at which Mayor Thompson, Assistant Corporation Counsel Breen and the two contending groups were present it was agreed that the Aldermen would have the power to decide on the routes of the proposed subway system, while authority over engineering plans and actual construction would be given to Michael J. Faherty, president of the local improvement board. A bill transferring to the City Council the right of location now vested in Mr. Faherty's organization is consequently being drafted by the corporation counsel. The Aldermen also voted to draft a supplementary bill providing for twenty-year special assessment bonds to finance the subway system instead of the five-year bonds now permitted by law, which would impose too great a burden upon property owners.

Fare Changes on Lines in Southern Michigan

During the year just drawing to a close a number of changes were made in the fare schedules of the Michigan Electric Railway Company and its subsidiary, the Southern Michigan Transportation Company, and the Michigan Railroad and its subsidiary, the Rapid Transportation Company.

In January, 1927, the rate of city fares in Lansing, Jackson and Battle Creek was 10 cents cash, four tokens for 25 cents; children's fare between the ages of five and twelve years, 5 cents with universal transfers. On the sixteen buses operated in Lansing the fare was 10 cents cash; children's fare between the ages of five and twelve years, 5 cents with universal transfers. In Kalamazoo the fare was 8 cents cash, four tokens for 25 cents; children between the ages of five and twelve years, 5 cents on cars and buses, with universal transfers.

Since then the management has induced the city officials in the cities just named to change these rates to 10 cents cash, three tokens for 25 cents, children between the ages of five and twelve years 5 cents, with universal transfers. These fares are the same on cars and buses.

The rate of fare on the Southern Michigan Transportation Company buses operating between Jackson, Battle Creek and Kalamazoo and between Jackson and Lansing was 3 cents per mile in January, 1927, but has been increased to 3½ cents per mile. No change was made in the rate of fare on the interurban cars operating between the stations just named, that rate remaining at 3 cents per mile.

The rate of fare on the Rapid Transportation Company buses operating between Kalamazoo and Grand Rapids and between Bay City, Saginaw and Flint, in January, 1927, was 3 cents per mile and has been increased to 3½ cents per mile. The fare on the interurban cars of the company operating between those points remains the same as before, 3 cents per mile.

The increase in fare on the interurban buses was brought about by filing tariffs with the Michigan Public Utilities Commission. An interesting sidelight is that the changes were received graciously by both the company's patrons and the newspapers.

The Denver Decision

Review of controversy now ended with ruling favorable to railway's contention for perpetual rights

UPHOLDING the federal district court, the U. S. Circuit Court of Appeals, as noted briefly in the ELECTRIC RAILWAY JOURNAL for Dec. 17, page 1127, handed down a decision in St. Louis on Dec. 8, declaring, in substance, the Denver Tramway's franchise perpetual. The ruling made final a district court decision restraining the city from enforcing its 6-cent fare ordinance. Circuit Judge Booth said:

> We agree with the conclusions that in neither the constitution of Colorado nor the statutes, nor the charter of the city of Denver, are to be found any provisions prohibiting grants without time limit.

The opinion failed to support only one minor finding of the lower court when it ruled that the value of the franchise grant under 1885 and 1888 ordinances is not essential to the questions at issue. The federal district court fixed the value of this franchise grant at $2,000,000. The high court said:

> We see no important reason for its inclusion in the decree, and since the city contends it is prejudicially affected by the finding and has objected to the inclusion of the findings in the decree, we think it should be eliminated. In other respects the decree is approved.

Thomas H. Gibson, attorney for the city, would not say definitely what the attitude of his office will be, but it was considered unlikely the city will try an appeal to the U. S. Supreme Court, inasmuch as this court refused to take jurisdiction last January.

The litigation just concluded began during the time of the World War, with the effort of the Denver Tramway to obtain a higher fare than the 5-cent one allowed in the 1906 franchise.

In 1918, the company appealed to the State Public Utilities Commission for permission to increase its fare. Shortly thereafter the commission granted the Tramway a 7-cent fare, but then the Supreme Court handed down its famous telephone case decision, holding that Denver is a home rule city and that, as such, the Public Utilities Commission had no authority over it.

At the company's request, the City Council then passed an ordinance granting the Tramway a 6-cent fare. About this time Dewey C. Bailey waged his campaign for election on a promise to restore the 5-cent fare. Following his election, the 6-cent fare ordinance was repealed, but the Tramway insisted a 5-cent rate was confiscatory and another ordinance was passed permitting the company to charge 6 cents.

The litigation then was carried into the federal court, where Judge Robert E. Lewis, then a federal district judge, granted the company its present 8-cent cash rate with two tickets for 15 cents. This award was carried to the Circuit Court of Appeals and upheld.

Judge Lewis made permanent an injunction restraining the city from enforcing its 5-cent fare demands, and this decision also was upheld by the high court.

The city and the company then began a long controversy over the valuation of the tramway, seeking to establish a basis on which return on investment might be figured. Henry A. Dubbs was appointed special master in chancery to set a valuation. Delos F. Wilcox was employed as the city's valuation expert and A. L. Drum as an expert for the company.

The company claimed valuation of $33,000,000, Mr. Wilcox contended for a valuation of $11,000,000, and Mr. Dubbs placed the valuation at $20,105,707, in October, 1923.

Attorneys for the tramway, appealed Mr. Dubbs' valuation to the federal court, and Judge Lewis, on Dec. 13, 1923, increased the figure to $23,514,769. At this time Judge Lewis decided the tramway franchise was perpetual, based on the grants of 1886 and 1888, but he

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held that the 5-cent fare provision was not binding.

When Henry E. May became city attorney, he appealed to the U. S. Supreme Court, contending that if the company had a perpetual franchise, the 5-cent fare provision also must stand. Last January, the high court ruled it had no jurisdiction in the matter, and the case was sent to the Circuit Court of Appeals, with which Mr. May filed briefs April 20, 1927.

The decision rendered on Dec. 8 was a rejection of the city's contention as carried in Mr. May's brief.

As things now stand the company would appear to be entitled to earn a return of 7½ per cent on a valuation of about $21,000,000. The present return is approximately 3.9 per cent, reports show, while patronage of tram lines has shown a steady decrease for several years. The problem before the directors, who are scheduled to meet in regular session on Dec. 29, will be to consider a fare which will provide a proper return without becoming too great to cut further into patronage. Figures made public recently, showed a drop of 6,000,000 fares in three years.

An Advertisement Tells of Progress

In announcing its plan to control taxicab cruising in Philadelphia, Pa., to which reference was made in the JOURNAL for Dec. 10, page 1080, the Philadelphia Rapid Transit Company recently ran advertisements in the daily papers of the city telling of the further steps which have been taken "in the interest of the 80 per cent" with the establishment of cab stands at nearly every street car stop in the business district. The company, owner of the Yellow Cab Company, expresses its belief that the new plan will assist in speeding up traffic for everybody and make Yellow Cab service more accessible than before. In its advertisement the company recognizes the slight change in the taxicab habits of the cab riders who will go to the nearest car stop for a cab instead of hailing one on the street The co-operation of all is sought in an effort to make the new plan a success—"to speed up traffic for the 80 per cent."

Downtown Parking in Oklahoma City Prohibited

The Oklahoma City, Okla., City Council has adopted an emergency ordinance abolishing double parking of automobiles in the downtown district. Cars unable to park at the curb may stop only long enough to discharge or take on passengers. It is believed that this will stimulate use of the electric railway cars, which, while not the purpose of the City Council, would be gratifying to many citizens, who consider the Oklahoma Railway essential to the proper movement of traffic of the city and are anxious to see the local railway property restored fully to its former prosperous condition.

Several months ago this property passed into the hands of local investors.

Safety Zone Stop Ruling in Minneapolis

A traffic ordinance effective Dec. 6 in Minneapolis, Minn., gives a definite limit to street car stop safety zones of a strip 4 ft. wide adjacent and parallel to the tracks, as long as the longest street car or street car and trailer. Except where there are safety zones, drivers of automotives must come to a full stop at least 10 ft. behind the street car until gates are closed. Drivers may pass at a reasonable speed to the right of safety zones, but never through them. Drivers may never pass a street car moving in the same direction to its left except where there is a one-way street.

Hearing on New York Labor Injunction Plea Jan. 23

Supreme Court Justice Wasservogel announced on Dec. 16, after a conference with the attorneys, that the hearing of the injunction suit by the Interborough Rapid Transit Company against the American Federation of Labor and its officers to restrain them from attempting to organize the Interborough employees, has been postponed from Dec. 21 to Jan. 23.

The adjournment was taken, it was said, because the papers in the case are so voluminous that more time will be needed for preparation before arguments are heard. Counsel for the labor organization will have until Dec. 24 to file answering affidavits, and counsel for the Transit company until Jan. 5 to file theirs.

Profitable Investment in Display Signs in Atlanta

A device that has proved a great convenience to car patrons of the Georgia Power Company was recently put in use by the new Jacobs Pharmacy at Peachtree and Ellis Street, Atlanta, Ga. A large display board has been placed at the rear of the store where it can be seen by all customers. Whenever a street car approaches the fact is signaled on the board with the information whether the car is bound north or south It is operated by a colored porter who stands outside the store and presses a button when he sees a car coming from either direction, but it has made the store a rendezvous for all passengers on this particular line.

Patrons do not have to wait in the rain watching for a car, nor do they have to run to the door every two or three minutes to see if a car is coming. The signal gives them plenty of warning and tells them what car is coming. This system, it is said, has brought in many new customers to the drug store.

Questions $7,000,000 Items in Interborough Accounting

New York City's Transit Commission, in demanding that the Interborough Rapid Transit Company amend its accounts covering subway operating contracts with the city, questions the propriety of certain items charged to the cost of operating the subway. Chairman Gilchrist notified the company that the commission has questioned items totaling more than $7,000,000 in its accounting and asked the company to inform the commission whether or not the company will refrain from collecting anything more on the accrued preferentials of about $4,800,000, pending settlement of the accounting items in dispute. The commission contends that the accrued preferentials will be wiped out by the adjustment of these controversial items.

President Hedley of the company said:

The contract between the city and the company provides that the commission may object to any expenditure as unreasonable or improper, whereupon the amount is held in a suspense account until the item in dispute is adjudicated by arbitration. If the determination of the arbitrators is that the expenditure is reasonable and proper, the amount must be charged against the proper account; otherwise the amount, with interest, must be borne by the Interborough and deducted from the accumulated deficits.

The Interborough does not concede that any item in its charges for expenses has not been actually and necessarily incurred in the operation of the subway. Differences of opinion might naturally arise as to whether certain expenditures should be charged to operation or to the company. For illustration: The expenses of the consulting engineers for their examinations in connection with the readjustment of the Manhattan Elevated rental some years ago are debatable either way. It is for just such items that arbitration is provided. It is not expected that any board of arbitrators will sustain the contention now advanced by the commission to anything approaching the amount recently claimed in conference, and which is set forth in the letter I have received.

As the matter presently will be submitted to a fair and impartial tribunal for determination, it will be advisable to reserve discussion of details until a hearing before the arbitrators.

Another Ticket Privilege in Alliance

The week-end pass, good for unlimited rides over the entire division of the Stark Electric Railway, Alliance, Ohio, on Saturday and Sunday is being issued in an effort to stimulate week-end business, including Saturday night trips to nearby cities for shopping and shows, and for week-end visits. According to E. W. Sweezy, general manager, the new pass will be sold for $1. It will be good over the entire system of 35 miles.

With this addition, the "ticket family" on the Stark Electric now has twelve members, including nine weekly passes, the Sunday, daily system and week-end permits.

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President Shannahan Outlines His Policy for Omaha

John N. Shannahan, the new president of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has assumed the duties of his position. In a statement to the press he said that the problem in Omaha appeared to be no different than it was in other cities he cited where intensive application of modern methods has restored companies financially. His first word to the people of Omaha was that the company is the servant of the public, and he would endeavor to have it so regarded by them. The company, he says, wants the Omaha public to ride the street cars. His efforts will be directed toward supplying service that would bring this about.

Lower Fare to Atlanta University

The Public Service Commission's order for new fares in Atlanta, Ga., on the lines of the Georgia Power Company has been revised so as to bring about a reduced rate between Atlanta and Oglethorpe University. In the order affecting the Oglethorpe University line the old fare of 13 cents, with privilege of transfer, will be replaced by a 10-cent fare without the privilege of transferring to another line. If a transfer is desired tickets will cost 13½ cents, while cash fares will be 16 cents. The old fare of 6 cents from Buckhead to Oglethorpe will not be increased, as was provided for in the original order of the commission.

Gary Operators Join Classes

Twenty-three operators, trainmen and linemen of the Gary Railways, Gary, Ind., have enrolled for the course in elementary electricity, which is being given free to employees by the company. Classes will be conducted in the Public Service Building every Tuesday night by Howard Ayers, member of the staff of instructors in electrical engineering of Purdue University.

Subway Budget Item Disallowed in New York

The decision of Supreme Court Justice Wasservogel, directing the Board of Estimate of New York City to eliminate from the 1928 budget the item of $13,000,000 for amortization of one-fourth of a proposed issue of $52,000,000 of four-year subway construction bonds, was affirmed unanimously on Dec. 16 by the Appellate Division. The decision not only declared that the $13,000,000 item had been placed unlawfully in the budget, but sustained the Citizens Union's contention that the certificate of the Controller as to the necessity of the appropriation was necessary.

The Appellate Division's decision is the second set-back for Mayor Walker and the majority of the Board of Estimate in their efforts to put through the plan of financing subway construction proposed by John H. Delaney, chairman of the Board of Transportation, and reduce the overhead on the cost of the city's new subways, sufficiently to permit the city to maintain the 5-cent fare on the lines which it is intended the city shall operate.

So the Shippers Might Understand

Completion of enlargement of Columbus freight terminal turned to advantage by railways to tell story to shippers
General discussion at dinner

THE completion of the enlargement of the Columbus freight terminal was the occasion for an inspection and "get-together" party at Columbus, Ohio, on Oct. 27, attended by traffic representatives of the most of the electric railway properties of Ohio, Indiana and Michigan, shippers of Columbus, Ohio, representatives of civic organizations in Columbus and officials of the Indiana, Columbus & Eastern Traction Company, who sponsored the party.

During the summer additions were made to the freight house and yards, consisting of an extension to the freight house, 41 ft. wide and approximately 65 ft. long, which increased the floor space 65 per cent and door capacity 70 per cent. The yard capacity was increased to accommodate 30 cars.

The effect of these changes was immediately noticeable. Overnight service traffic between Columbus and Springfield, Cincinnati, Dayton, Fort Wayne, Detroit, Cleveland and many intermediate points began to pick up. Unsolicited reports from shippers indicated that they were highly pleased with the new service. Complaints from the connecting lines, regarding congestion, at this point, were no longer received.

The officials then decided that the achievement of the Columbus Interurban Terminal Company (the holding company of traction terminals in Columbus) should be fittingly celebrated. A "get-together" meeting and inspection party was planned and letters of invitation were sent to traffic and managing officials of connecting Ohio, Indiana, and Michigan lines, shippers and representatives of civic organizations in Columbus. Later, illustrated invitations were mailed giving the complete program for Oct. 27.

The meeting during the day was presided over by W. R. Huffer, traffic manager of the Indianapolis, Columbus & Eastern Traction Company, who also conducted the tour of inspection through the freight terminal and yards. Following the luncheon at noon the guests were taken for a tour of the capital in special buses of the Dayton & Columbus Transportation Company, a subsidiary of Indiana, Columbus & Eastern Company. The new O'Shaughnessy Dam, Ohio State University grounds and commercial districts were viewed, and the tour ended at the Elks Country Club.

At 6 o'clock dinner was served at the Country Club, and, acting as toastmaster of the occasion, J. M. Pogue, general manager of the Indiana, Columbus & Eastern Company, endeavored to sponsor the "get-together" spirit which was prevalent in the meeting and stressed the various freight activities of interurban lines in the territory. Emphasis was laid upon the fact that the lines were being called upon to furnish considerable freight equipment for handling carload business, particularly cement, as two large plants are located at Osborn, Ohio, viz., the Southwestern Portland Cement Company and the Wabash Portland Cement Company.

The meeting was turned into a round-table discussion and compliments from the Columbus shippers and Chamber of Commerce officials regarding the service of the electric lines were enthusiatically received by the guests. Expressions of the Columbus shippers were to the effect that fast and efficient service, as had been built up by the electric lines, would continue to build up the electric freight business and the consensus of opinion seemed to be that many shippers were sending every possible pound of freight via the electric lines.

Various traffic officials had an opportunity to state their problems and to outline what their individual properties were planning for the coming year in the fields of solicitation, advertising and improved operating facilities. Discussion centered on the thought of greater co-operation and improved service, during the coming year as affecting the interurban properties and the shippers of the Central electric territory.

The concensus of opinion is that the groundwork was laid at this meeting for further co-operation with all electric lines in the territory. That was the desire in the first instance, and the belief exists that the gathering was more than partially successful in this respect.

Another Move in Des Moines One-Man Car Case

The Des Moines City Railway, Des Moines, Iowa, lost its final attempt to break loose from compulsory two-man car operation when the Iowa Supreme Court on Dec. 17 refused the company a rehearing in its case against the street car men's union.

The high court had previously upheld the Polk County District Court in ruling that the 25-year agreement between the union and the company making two-man car service obligatory is bind-

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ing in all of its features. The agreement was signed in 1915.

However, in spite of the Iowa Supreme Court's refusal to reopen the case, the decision of Dec. 17 is felt to have but little actual bearing on the situation as it exists now. The Des Moines City Railway has been in receivership since Nov. 11, this year, and Federal District Judge Martin J. Wade has empowered the receivers to terminate any contract affecting operations which involves either labor or materials.

So far the receivers have given no inkling as to whether they will institute one-man cars. However, F. C. Chambers, operating receiver and president of the company, has stated repeatedly that the company could save from $250,000 to $300,000 annually by substituting service with one-man cars. With the company facing an operating deficit of $129,000 for 1927, it is generally agreed that nothing short of one-man cars will save the day.

More Facts in Galveston Fare Case

Additional data in connection with the application of the Galveston Electric Company, Galveston, Tex., for an adjustment in car fares have been presented to the City Council by R. G. Carroll, general manager. The board was asked to consider the value of property used for transportation purposes "upon which we are entitled to earn a fair return." The company declared that the actual cost of property used to furnish railway service in Galveston was $2,170,718 on July 31, 1927, and that since that time $88,000 in capital expenditures had been made for railway purposes, including $65,000 for new cars.

Some weeks ago the company asked for an increase in fares on the basis of four tokens for 30 cents, a straight 10-cent fare or the purchase by the rider of a 25-cent weekly ticket, the holder of which would ride each time for an additional 5 cents. This compares with the present fare of 6 cents.

Improvements to Be Made by Reading Transit

A contribution of $43,666 toward the cost of eliminating a grade crossing in the Borough of Bridgeport, Pa., has been demanded of the Reading Transit Company by the Pennsylvania Public Service Commission. A major portion of the money to be paid by the railway will be for the reconstruction of its tracks made necessary because of the improvement.

The commission directs the company to pay $37,161 for these track relocations in the borough. The railway also must pay $5,000 toward the cost of building the new bridge which will eliminate the grade crossing. The company also is to contribute 1 per cent toward the cost of taking property for the improvement. These property damages are estimated at more than $150,000 which will make the company's share about $1,505 for that item. A crossing over four tracks of the Reading Company is to be abolished by the construction of a bridge. The estimated cost of the work is $258,872, of which amount the electric railway will contribute more than $42,000. The property damages are additional to the other costs.

Isn't That the Truth?

THERE is nothing sacred about a nickel in the street car business; there is nothing, either, that would definitely fix 10 cents as the limit. Those who ride the car lines will have to pay what it costs. Chase the matter through arguing between company and Council, chase the issue through the courts, chase it anywhere you please, and, in the end, that is what it will amount to. If railway service functions, it must be paid for. That part of the matter is inescapable.

—*Lansing Journal.*

New Uniforms for Safe Records in Memphis

Approximately 100 trainmen of the Memphis Street Railway, Memphis, Tenn., will be presented with new uniforms and caps as Christmas gifts by the management. Their records disclose no accident which cost the company money within the past year. A. D. McWhorter, general superintendent, said it was an expression of appreciation to 40 per cent of the trainmen who have had no accident, causing damage claims.

More Than 2,500 Boston Cars Replaced

The Boston Elevated Railway, Boston, Mass., owned, at the time the property was taken over by the public trustees in 1918, 3,372 surface cars, of which 1,354 were open cars, leaving 2,018 closed cars. At that time, the use of the open cars had been entirely abandoned and their value was negligible. The number of surface cars owned Dec. 31, 1926, was 1627, which was a shrinkage of 391 in the number of such cars owned in 1918. The book investment in both rapid transit and surface cars on July 1, 1918, was $17,427,000, as against a book investment in 1926 of $24,628,000. This increase was provided for by the proceeds of the issue of securities and by the depreciation reserve, or by proceeds from the sale of the Cambridge subway. Of the original surface cars owned in 1918 there remained only 842 on Dec. 31, 1926.—*From statement of committee reporting on Boston Elevated.*

St. Louis Company Meets Patrons "On the Air"

To popularize its service with the inhabitants of St. Louis and vicinity the St. Louis Public Service Company, new owners of the street railway system in St. Louis, Mo., has taken to the air. The company has engaged prominent quartets of St. Louis to give programs via Radio Station KMOX, the "Voice of St. Louis."

In the initial hour of the St. Louis Public Service Company air career the Pilgrim Quartet featured Christmas carols and other songs suitable to the holiday season.

William E. McCoy Has Enviable Record

To commemorate his 35-year service record William E. McCoy, veteran street car motorman of the Roanoke Railway & Electric Company, Roanoke, Va., was presented a service pin at a recent meeting of the employees. The pin is studed with seven diamonds, one for each five years of his time with the company.

Since early in 1894 Mr. McCoy has been running on the Salem line and in the intervening years has become well known to thousands of patrons. Offered opportunities for advancement, he passed them by satisfied with the genuine pleasure he found in the train service.

In commenting on his experiences the Roanoke *Times* says that Mr. McCoy has profited by what has crossed his vision.

Curtis Bay to Be Tapped by Washington-Baltimore Line

The Washington, Baltimore & Annapolis Electric Railroad has decided to build a branch line into the Curtis Bay District near Baltimore. Rights of way have been acquired by the company and the Public Service Commission may soon be asked to approve construction of the line. The branch probably will run from Shipley Station, on the main line, to the junction of Cabin and Curtis creeks.

Belt Line Project in Oklahoma City Awaited

With the termination of the receivership of the Oklahoma Railway, Oklahoma City, Okla., efforts will be made at once to build a belt line, a project which met with much opposition when

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first proposed. Arrangements for financing the belt line were completed recently by Hubert R. Hudson. At the time, Mr. Hudson arranged to meet almost $1,000,000 in junior mortgage bonds which are due Jan. 1, 1928.

One-Man Cars to Continue on Stark Electric

The state ban against one-man cars on the Stark Electric Railroad, Alliance, Ohio, has been lifted. General Manager E. W. Sweezy, appearing before the Ohio Public Utilities Commission at Columbus, was assured that the state citation, received a short time after two interurban cars had crashed near Sebring, would be indefinitely deferred.

Appearing before the officials with records of one- and two-man operation, covering a period of twelve years, Mr. Sweezy gave his reasons why the company should not be compelled to discontinue one-man operation until a block system had been installed. The figures showed that under two-man operation an accident was recorded every 530,000 miles, while with one-man operation there has been only one wreck in approximately 1,250,000 miles.

While the state department has not ordered the installation of a block signal system, this is being planned for the near future, according to Mr. Sweezy. Next summer, it is believed, business on the line will warrant the additional cost for installation over part of the division.

Strike Continues on Schuylkill Railway

No report of material progress in the status of the Schuylkill Railway strike emanates from that territory. On Dec. 9 a conference was held in Philadelphia between the receivers and representatives of the men through M. A. Kilker, a lawyer of Girardville, Pa., who made an earnest plea for settlement. These efforts so far have proved unavailing, though Mr. Kilker is still endeavoring to promote this purpose.

The differences between the receivers and the men relating to the wage scale were satisfactorily adjusted, but the men, at a subsequent meeting, rejected the offer as a whole because the receivers found themselves unprepared and unable to extend the agreement with the railway men to include bus men of a separate corporate organization over whom they had no control or influence.

California Franchises Granted

The City Council of Richmond, Cal., has passed the ordinances of the Key System Transit Company authorizing three new franchises for the local lines in Richmond. These 50-year grants are effective on a new basis which relieves the company of much of the burden of paving its right-of-way and of track reconstruction.

Safety Bonuses Awarded to Brooklyn Operators

Safety bonuses aggregating $125,060 were awarded last week by the Brooklyn City Railroad and the Brooklyn-Manhattan Transit, Brooklyn, N. Y., to their employees who had a record for no "at fault" accidents in operating surface cars. The former distributed $71,000 and the latter $54,060.

On behalf of the Brooklyn City Railroad, Borough President Byrne, in his reception room at Borough Hall, on Dec. 16 presented to each of 28 motormen, conductors and safety car operators of the company a gold watch suitably engraved. The company awarded the watches to those employees who had operated cars for the twelve months ended Nov. 30, 1927, without an accident. The watches were presented in addition to the regular $60 safety bonuses which each man earned.

Mr. Byrne, after commending the men for their work in reducing accidents on city streets, handed to each employee a watch on which was engraved "Presented to ——— by Borough President James J. Byrne for Brooklyn City Railroad, Dec. 16, 1927, in appreciation of an excellent safety record Dec. 1, 1926, to Nov. 30, 1927." Those who received the watches were:

John Boyce, Vincenzo Cincotta, Lawrence G. Day, John Dinnean, William Esperstedt, Christian Frohlich, T. J. Fallon, Michael Hamil, W. J. Hammill, C. F. Heynen, J. Juggenheimer, M. J. Kowalinski, Patrick Keane, Patrick Kilday, Michael J. Killeen, Patrick McGuiness, James J. Martin, James J. O'Keefe, Stanislaw Olszewski, Frank Reahl, Mathew J. Reilly, John Rothenhousen, Jacob H. Schultz, Anton Schock, Henry W. Schult, Frank M. Smith, Adolph Seebeck, Frank J. Weiss.

The award of safety bonus checks is an annual feature of the Brooklyn City Railroad's campaign to reduce accidents on its transit lines. All motormen, conductors and safety car operators are credited with $5 for each 30 days operation without accident during the period from Dec. 1 to the following Nov. 30.

Clinton E. Morgan, vice-president and general manager of the railroad, states that of the 2,180 car operators of the company 91 per cent received checks this year in amounts varying from $60 to $5. The total amount of the bonus, for 1927, $71,000, was earned by the men in reducing all accidents for the year ended Nov. 30, 1927, over the preceding twelve months by 12 per cent. The 1,987 men who received awards this year worked 428,820 days without an "at fault" accident. Officials of the company computed that the 28 car operators who received the gold watches had carried 7,819,000 passengers and operated their cars more than 752,000 car-miles without an accident.

Bonuses aggregating $54,060 on Dec. 16 were in the hands of 1,892 motormen and conductors of the B.-M. T. surface lines as a reward for operating their cars for one or more periods of 30 days without accidents for which they were at fault.

The bonuses were awarded as a result of the accident prevention bonus plan put into effect on the B.-M. T. surface lines on Feb. 1, 1927, and were earned during the ten months ended Dec. 1, 1927. The individual bonuses ranged from $55 to $5 and averaged nearly $30 to each of the 1,892 car men who qualified for bonuses under the plan.

Of the $54,060 total, $2,425 was distributed as special bonuses to 485 motormen and conductors who in the period from Feb. 1 to Dec. 1 had operated their cars for at least 180 consecutive working days without an accident for which they could be held responsible. The records showed that 130 motormen and conductors had maintained absolutely clear records so far as chargeable accidents were concerned during the entire ten-month period.

Efforts—and success—in reducing accidents were not confined to the veteran car men, however. This fact is established from the records, which show that 1,892 out of a total 2,131 men at the various B.-M. T. depots operated for one or more periods of 30 consecutive working days without an "at fault" accident. These 1,892 men together operated their cars for 310,000 working days without being responsible for a single accident.

Photo by Underwood & Underwood

Brooklyn surface trainmen receiving awards for safety, with Borough President Byrne officiating

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Rehearing on Oakland Fare Request

A rehearing has been granted the Key System Transit Company of Oakland by the California Railroad Commission on the 5-cent zone fare order which was halted by the company's protest. Commissioner Clyde Seavey will preside at the rehearing, set for Jan. 24 in the City Hall at Oakland.

The company seeks to have its own plan substituted for the zone plan. It has asked a raise in transient street car fares from 7 to 10 cents and in ferry fares from 21 to 25 cents. The company also seeks permission to sell weekly passes to regular riders for $1 over territory now included in the 7-cent fare zone and for $1.50 weekly over entire traction system. Monthly passes good on Key System cars, trains and boats would cost $10.

The commission's order for a 5-cent zone or basic fare and 20 cents on ferries was attacked as confiscatary in the company's formal protest.

No Parking Law Effective in Chicago Loop Jan. 2

Parking of automobiles in the Chicago Loop district will be abolished for a trial period of three months beginning Jan. 2 under the terms of an ordinance passed by the City Council on Dec. 14 by a vote of 37 to 4. It is expected it will be signed by Mayor Thompson. Prohibition against parking has been urged by civic bodies and traffic experts for many months as the only effective means of expediting street traffic in one of the most heavily congested districts of its size in the world. The ordinance, which has been approved by the Chicago Association of Commerce, embodies many of the recommendations made by Miller Clintock of Harvard University, in the traffic survey he completed last year.

The new rule will be in effect from 7 a.m. to 6:30 p.m. except Saturdays, Sundays and holidays. On Saturdays it will be enforced only until 3 p.m. All restrictions will be lifted on Sundays and on certain national holidays. This ban will not affect stops made by vehicles to discharge or pick up passengers. Taxicab stands established by ordinance will also be entitled to their quota of cars awaiting fares. Ambulances, fire trucks and public utility company vehicles operated for emergency purposes will likewise be exempted from the ban. Penalties for violation of the ordinance are fixed at from $1 to $25 for each offense. If, after a few months' time, the restriction should be popularly regarded as a failure, the City Council indicated that the law would be repealed.

Among the objections cited to the ban—many of which were heard in previous public meetings on the question—was that it would bring more taxicabs on the street and discriminate in favor of the automobile owner employing his own chauffeur. Several downtown merchants and hotel proprietors testified at the hearings that it would drive away business from their doors. Proponents of the law held that it would speed up traffic and help business by making the downtown streets more passable for shoppers.

Utility Inquiry Authorized

Senator Walsh (Democrat) of Montana, on Dec. 17 introduced a resolution proposing an inquiry into the financing and control of public utilities companies throughout the country and into any attempts which may have been made by the companies to carry on propaganda to influence public opinion with respect to the ownership of sources of power, or the generation or distribution of power.

The investigation proposed, under the terms of the Walsh resolution, would be carried on by a special committee of five Senators.

Senator Walsh asked that his resolution be referred to the committee to audit and control contingent expense. Senator Moses (Rep.) of New Hampshire asked first if Senator Walsh would be satisfied to have the resolution referred to the committee on interstate commerce and when the latter said he saw no reason for such a reference, Senator Moses then asked that the resolution lie over for future consideration.

On Dec. 19 the Senate by a vote of 40 to 36, decided to refer the Walsh resolution to the committee on interstate commerce. On the vote to send the resolution to the latter committee thirteen Democrats joined with 27 Republicans in opposition to the course of action sought by the Montana Senator. On the other side eleven Republicans voted with 24 Democrats and Senator Shipstead (Farmer-Labor), Minnesota, in opposition to the motion of Senator Moses.

The resolution differs from the one introduced by Senator Walsh in the last Congress, in that several new clauses have been added, the most important being that embodied in the second paragraph concerning publicity and political activities of utility companies, which is entirely new.

Consideration of the matter by the committee will begin on Jan. 16.

Harvard Advertising Awards to Be Announced in January

The jury of the Harvard Advertising Awards, including prominent advertising men of agencies, publications, industry and educational institutions, will meet the middle of January to award the prizes for outstanding advertising material of the year, 1927.

These awards are:

1. Four prizes of $2,000 each for the campaigns most conspicuous for the excellence of planning and execution, seeking publicity on a national scale, seeking publicity for industrial products primarily through trade journals, seeking publicity in a local area, and for the campaign executed locally in cities of 100,000 population or less.

2. Four prizes of $1,000 each for the advertisement most effective in its use of text, for the advertisement most effective in its use of pictorial illustration, for the advertisement most effective in its combination of text and illustration, and for the advertisement most effective in typography.

3. A prize of $2,000 for the advertising research of the year most conspicuous either because it has brought about economy or secured efficiency in advertising by producing information of general value in furthering the science of advertising, or because it has reduced or precluded unwise or wasteful expenditure in a specific advertising program.

4. A gold medal, awarded to the individual or organization deemed by the jury to merit recognition for distinguished contemporary services to advertising.

Advertising material to be eligible for this year's competition must be submitted to the Harvard Advertising Awards, Harvard Business School, Soldiers Field Station, Boston, Mass., not later than Dec. 31, 1927.

The Harvard Advertising Awards, were founded in 1923 by Edward W. Bok.

Outline of Public Utility Economics

By Martin G. Glaeser. New York: Macmillan Company, 1927. 847 pages. Price, $4.25.

This is one of the series of social science text books edited by Dr. Richard T. Ely, who has written an introduction to the book. He believes that future writers will refer to the volume as beginning the scientific treatment of public utilities.

The author is professor of economics at the University of Wisconsin and Research Associate of the Institute for Research in Land Economics and Public Utilities. He also brings to his task the benefit of long experience as statistician and case investigator for the Wisconsin Railroad Commission. The book is divided into four parts, as follows: The economic basis of public utility enterprises, the development of agencies of regulation in the United States, the administration of public utilities under regulation, and trends in public policies affecting utilities. Throughout the book are many statistical charts and tables, which help to illuminate the text. In his discussion of valuation of utilities, the author tends toward the investment method, and recommends a variation in the rate of return according to current interest rates. The appendix includes a proposed service-at-cost franchise, drafted for Milwaukee by a joint aldermanic and citizens' committee for which Professor Glaeser acted as adviser.

The volume should be most helpful to electric railways, the problems of which are considered extensively in "The Outline of Public Utility Economics."

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Recent Bus Developments

Competition Between Kansas City and Independence Denied

The Missouri Public Service Commission decided on Dec. 16 that the privilege of a bus company to compete with the suburban street car lines of the Kansas City Public Service Company between Kansas City and Independence, Mo., should be denied. An application for a bus permit submitted by King Brothers to operate buses between Oak Grove and Kansas City was granted by the commission with the proviso that the company should refrain from picking up or discharging passengers between Independence and Kansas City on the grounds that the street railway company was already giving "excellent and frequent service" in that territory. The bus company will be permitted to receive and discharge fares between Oak Grove and Independence and carry such passengers to Kansas City. The buses will use United States Highway No. 40.

Consents for Newark-Paterson Buses Approved

Municipal consents to the Public Service Transportation Company, Newark, N. J., to operate eight de luxe auto buses on the Paterson-Newark route, by way of Bloomfield and Clifton, have been approved by the Public Utilities Commission. The testimony indicated the proposed route would afford a quicker service between Paterson and Newark. The rate of fare follows: Newark to Bloomfield, 25 cents; Newark to Clifton, 40; Newark to Paterson, 50 cents.

Program for Interstate Carriers Urged

The lack of federal legislation for control of bus operations in interstate traffic creates a problem of increasing importance with the expansion of the traffic, says the Interstate Commerce Commission in its annual report to Congress, recently issued. The full text of the statement made by the commission on this matter reads:

In our last report we referred to the investigation on our own motion into and concerning the general question of the operation of buses and trucks by, or in connection or competition with, common carriers subject to the interstate commerce act.

During the past year laws were enacted in four states providing for the regulation or control over common-carrier motor vehicles in 42 states and the District of Columbia. The rapidly increasing use of buses and trucks makes the absence of any regulatory control over those engaged in interstate commerce a problem of constantly increasing importance.

Statistical summaries of the answers of the respondent railways to questionnaires have been tabulated and made available to the public.

We deem it advisable that a proposed report be prepared by an examiner and served upon the parties to the proceedings, thus affording opportunity for the filing of exceptions thereto, to be followed by oral argument before us and report thereon to the Congress with our recommendations as speedily as may be consistent with the nature and importance of the subject.

Buses Must Remain Off Car Streets in Peru

An amendment to the bus law in Peru, Ind., recently passed by the City Council states that it will be unlawful for public service automobiles to operate on streets paralleled by street cars except where it is necessary for the drivers to make up their routes. The ordinance fixes a bond of $2,000 for each operator—or machine—having a carrying capacity of not more than five persons, and an additional sum of $250 for each person in excess of that number. The maximum bond for any bus will be $3,000 annually. All operators must make written application for licenses. The Indiana Service Corporation operates in Peru.

Dismisses Objections of Schuylkill Railway

The Superior Court dismissed the appeal of the Schuylkill Railway, Girardville, Pa., on Dec. 15 from the order of the Public Service Commission granting a certificate of public convenience to the Reading Transportation Company, which is to operate the bus lines in twenty-four counties of Pennsylvania. The Schuylkill Railway interests based their opposition on the fear of destructive competition. Judge Henderson said in an opinion that the objections "are premature, as nothing has yet been decided by the Public Service Commission save that on the evidence submitted the new corporation may be created."

Extensions in Connecticut

Bus service has been started by the Connecticut Company between Meriden and Middletown, Conn. The company still maintains service on its electric railway between Westfield and Meriden.

New Service by Bus in Gadsden

The Alabama Power Company, owner and operator of the electric railway at Gadsden, Ala., will take up the car tracks on Ewing Avenue, Gadsden, and substitute bus service. The power company is to pay $5,000 toward the cost of paving this thoroughfare.

Buses in Joplin Follow Cars

The Joplin & Pittsburg Railway has organized a bus line to supplant the cars on the Cunningham-Schifferdecker Park division in Joplin. For most of the way the buses follow the route of the railway.

New Line in Kansas City Promised

After more than two years of attempting to secure adequate transportation facilities for the vicinity of 43d Street, Kansas City, Mo., the residents of the neighborhood have at last secured the approval of the Kansas City Public Service Company and a bus line with ten-minute service for an eight-hour day will be installed. The Indiana Avenue stub line did not afford adequate transportation. Transfers will be given from buses to cars. The City Council has yet to pass upon the installation.

Larger Bus Proposed in Boston

The Boston Elevated Railway has decided to introduce into the service in Boston, Mass., a motor coach of a larger type than that now in use and is planning a 60-day experiment with two buses that resemble a modern trolley car, are 31 ft. long and seat 40 passengers. Longer cars are not permitted in Boston under the bus laws and the rules of the Public Utilities Department, but the Elevated is seeking a special 60-day exemption from those rules in the case of two trial cars. If the opportunity for an experiment is given the route used will be in a busy business section, and if it proves successful the company will buy larger buses in the future. No opposition to the plan has been encountered, but it may be necessary to secure an amendment of the bus laws of the state.

Buck vs. Kuykendall Quoted in Another Interstate Case

The Appellate Division of the New York Supreme Court for the Second Department has handed down a decision sustaining the right of the Journal Square Coach Transportation Company to operate a bus line between Journal Square, Jersey City, and the town of Nyack, in New York, without a license from the Town Board of Orangetown. It also reversed the order made by Justice Arthur S. Tompkins on Aug. 20, 1927, restraining the Journal Square Coach Transportation Company from continuing to operate a bus line over the public highways in the town of Orangetown until granted permission to do so by the Town Board of Orangetown.

The decision of the Appellate Division upholds the contention made in behalf of the Journal Square Coach Transportation Company that, since it was engaged only in interstate transportation, it was not required by law to secure

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the consent of the Town Board of Orangetown for such interstate operation. This was in effect also the prior ruling made by the Public Service Commission. It overrules the contrary views advanced by the Town Board's attorney, E. W. Hofstatter, which the Town Board had followed in stopping the operation of the bus line.

The decision of the Appellate Division was unanimous.

By its decision, the Appellate Division reversed the temporary injunction order of Justice Tompkins and denied the original motion of the town of Orangetown for a temporary injunction. It held that the Journal Square Coach Transportation Company was not required to have either a license from the local authorities or a certificate of convenience and necessity from the Public Service Commission, but that the bus company was subject to impartial reasonable regulations by duly constituted authority. It also held that the action of the town of Orangetown in denying the company's application was arbitrary.

The opinion of the court, in full, is as follows:

364 N.E. Town of Orangetown, respondent vs. Journal Square Coach Transportation Cmpany, appellant.

Order reversed upon the law, with $10 costs and disbursements, and motion for injunction pendente lite denied, the $10 costs. The plaintiff arbitrarily denied the application of defendant for a license. No question of rules, regulations or tax free requirements were raised. The defendant, which is doing an exclusively interstate transportation business, is not required to have either license from local authorities or certificate of "convenience and necessity" from the Public Service Commission, and may operate subject to reasonable rules and regulations adopted, and payment of reasonable fees provided for, by duly constituted authority. (Buck vs. Kuykendall, 267 U.S. 307; Bush Co. vs. Maloy, 267 U.S. 317.) Rich, Young, Kapper, Lazansky, and Hagarty, JJ. concur.

Bus Substitution Suggested in Moorestown

The Public Service Railway, Newark, N. J., desires to abandon railway service from Camden to Moorestown and substitute buses. Before the Board of Public Utility Commissioners in Camden on Dec. 5 a railway representative said that if trolley service were continued it would be necessary to spend $200,000 for new tracks, that it was the purpose of the company to operate buses on a fifteen-minute headway along with service to Mount Holly by way of Burlington. At the suggestion of counsel for the community of Moorestown the case was continued so as to permit public sentiment to be sounded.

PERMIT GIVEN FOR BUS OPERATION.—The Wisconsin Motor Bus Lines has been granted a permit by the West Allis City Council to operate buses from Milwaukee to West Allis. This is the bus subsidiary of the Milwaukee Electric Railway & Light Company.

Financial *and* Corporate

United Gas Improvement Sells Stock of National Public Service

The United Gas Improvement Company has arranged to sell its minority interest in National Public Service Company B stock to E. H. Rollins & Sons and Howe, Snow & Company of New York.

These firms previously held about 15 per cent of the common B stock, no par value, which has exclusive voting power.

The sale of the B stock embraces 50,000 shares owned by the United Gas Improvement Company direct and 48,946 shares owned by Day & Zimmermann, Inc. The United Gas acquired its B stock when it purchased control of Day & Zimmermann, Inc.

The National Public Service Company is a holding company, which, through its subsidiaries in New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, Georgia and Florida, operates steam, electric railways and buses to 374 communities with a population of more than 2,000,000.

Suburban Line Merged With Milwaukee System

The Wisconsin Railroad Commission has approved the merger of the Milwaukee Northern Railway with the Milwaukee Electric Railway & Light Company. The Milwaukee Northern operates between Milwaukee and Sheboygan. City fares on the Northern line will be increased from 5 cents to 7 cents to conform with Milwaukee city fares. The Milwaukee Electric Railway & Light Company has long held the second preferred and the common stocks of the Milwaukee Northern Railway.

Last of Mesaba Railway Soon to Be Sold

With practically all of the company property and equipment sold, receivers for the defunct Mesaba Railway, Virginia, Minn., serving Mesaba Range communities, expects an early discharge of the receivership.

When the remaining property and the other equipment are disposed of, it is estimated that the gross salvage return on a total cash investment of about $2,000,000 will amount to about $200,000. From this sum receivership expenses and other debts must be met.

Considerable office equipment, several car bodies, the former residence of the superintendent of the line, and twenty-six lots in the Great Northern addition to Virginia, remain to be disposed of, as well as a substation and waiting room at Chisholm.

In all, nine car bodies have been purchased by buyers, for a varied number of uses.

The company passed into the hands of the receivers, James C. Chestnut, Virginia, and Oscar Mitchell, Duluth, on March 7, 1924. Authority to abondon the line was granted by Judge Cant late last winter. The last passenger car was operated over the line from Hibbing to Gilbert on April 16 of this year, but freight car service was continued until June.

The interurban line was placed in service on Christmas day, 1912. The system comprised 40 miles of line.

Reorganization of Indianapolis & Cincinnati Traction Awaited

Intimation was made recently in Circuit Court at Rushville, Ind., that plans were afoot to perfect a reorganization of the Indianapolis & Cincinnati Traction company, as the time draws near for the official court order to sell the property involved in a mortgage that exceeds $2,000,000. The receivership case has been pending in court for several months, and has almost reached the point where the court is ready to order the receiver, Will M. Frazee, to sell the properties.

Receivers Discharged in Oklahoma City

The receivership of the Oklahoma Railway, Oklahoma City, Okla., under which the road has been operated since Dec. 28, 1924, was ended on Dec. 16 when George A. Henshaw, and G. T. Lackey, joint receivers turned the properties to Hubert R. Hudson and his associates, who recently acquired the controlling stock in the road.

Coincident with the announcement of the ending of the receivership, President Hudson declared that rearrangement of the financial structure of the road was under way.

Messrs. Henshaw and Lackey will continue in charge of the road until Jan. 1, at which time Mr. Henshaw will again devote all his time to his private law practice. Mr. Lackey plans now to remain with the company indefinitely, in order to assist with the reorganization. He has been with the railway since 1920, in an executive capacity.

When bondholders finally asked for a receivership late in 1924, the railway was at a low ebb, having seen a steady decline since 1921, as motor cars continued to increase in numbers. Mr. Henshaw, a former corporation commissioner and widely known attorney, was named by Judge Cotteral to be a joint receiver with John W. Shartel, then president of the company. Mr. Lackey succeeded Mr. Shartel, at Mr. Shartel's death eighteen months ago.

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Since the receivership, however, the fortunes of the railway company have moved in a different direction. Increasing motor cars have made traffic congestion so terrific that street cars are hauling more people every month. Revenues for the first eleven months of 1927 were $1,913,645, compared with $1,570,967 during the similar period a year ago. For the first ten months of 1927 13,123,855 fares were collected. For the similar period last year the number was 11,796,215. The total for 1926 was 14,360,274. On the strength of the comparison for the first ten months of both years Charles Hoopes, operating manager, predicts that the total for 1927 will be approximately 16,000,000 fares.

Ten years ago the railway carried 14,301,323 passengers. By 1920, the peak year in the history of the company, the cars were carrying 20,532,897 passengers. In 1922, this figure was cut to 17,650,854. Then the slump continued in an alarming way until last year, which showed improvement over year before.

During the receivership the number of new type cars has been increased from ten to forty, while in all the company has in operation 126 street cars and 26 buses. Tracks are in excellent shape, it being pointed out that nearly $200,000 has been spent during the last year for repairs.

Intention of Appeal Filed by O'Fallon

Notice of intention to appeal to the United States Supreme Court was given by the St. Louis & O'Fallon Railroad on Dec. 19 when a special three-Judge Federal Court entered its formal order upholding the Interstate Commerce Commission's order for recapture of approximately $260,000 excess earnings of the railroad.

Decision in the O'Fallon case was announced Dec. 10. The suit has been regarded as the key case to the valuation of all railroads of the United States for ratemaking and the limitation of earnings.

Approval of $2,475,000 Note Issue Sought in St. Louis

Right to issue $2,475,000 of 5 per cent gold notes is sought by the St. Louis Public Service Company in an application filed with the State Public Service Commission. The application states that this is a part of the plan to facilitate the funding of the $36,300,000 of first mortgage bonds of the United Railways assumed by the successor company.

The first $9,000,000 of the United Railways will mature in 1934. The St. Louis Public Service Company proposes to give for each $1,000 bond $600 in cash, with interest at 6 per cent from Jan. 1, 1928, to date fixed for payment and $275 in gold notes.

The gold notes may be called for redemption in 30 days at the option of the company or converted at option of the holder into preferred stock of the St. Louis Public Service Company at the rate of three shares of the series "A" of the preferred cumulative dividend stock.

Conspectus of Indexes for December, 1927

Compiled for Publication in This Paper by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Dec. 1927 7.57	Nov. 1927 7.56	Dec. 1926 7.42	Dec. 1927 7.57	May 1923 6.88
Electric Railway Materials* 1913 = 100	Dec. 1927 140.6	Nov. 1927 141.3	Dec. 1926 159.2	Sept. 1920 247.5	Dec. 1927 140.6
Electric Railway Wages* 1913 = 100	Dec. 1927 228.4	Nov. 1927 228.3	Dec. 1926 226.3	Sept. 1920 232	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Dec. 1927 200.7	Nov. 1927 199.4	Dec. 1926 203.2	July 1920 256.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	Dec. 1927 203.9	Nov. 1927 202.0	Dec. 1926 210.8	June 1920 273.8	March 1922 162.0
U. S. Bur. Lab Stat. Wholesale Commodities† 1926 = 100	Nov. 1927 96.7	Oct. 1927 97.0	Nov. 1926 98.4		
Bradstreet Wholesale Commodities 1913 = 9.21	Dec. 1 1927 13.53	Nov. 1 1927 13.39	Dec. 1 1926 12.78	Feb. 1 1920 20.87	June 1 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Nov. 1927 156.5	Oct. 1927 156.1	Nov. 1926 161.6	July 1920 219.2	March 1922 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Nov. 1927 164.2	Oct. 1927 163.7	Nov. 1926 168.2	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Nov. 30 1927 3.454	Oct. 31 1927 3.341	Nov. 30 1926 3.807	July 31 1920 11.118	May 31 1927 3.051
Bank Clearings Outside N. Y. City (Billions)	Nov. 1927 19.50	Oct. 1927 19.97	Nov. 1926 18.31	Oct. 1925 20.47	Feb. 1921 10.43
Business Failures Number	Nov. 1927 1660	Oct. 1927 1471	Nov. 1926 1614	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	39.23	35.98	60.31	122.95	27.22

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

†This index is changed to a base of "1926 = 100." That notation replaces the former basis of "1913 = 100." Inasmuch as the bureau has not calculated the index on this new base any further back than January, 1923, no figures are shown in this tabulation for the high and low points since the war. It is planned to compute the index on the new basis as far back as January, 1913. Until such time as the bureau makes public these figures for the earlier years this information will be lacking.

Tax Settlement Nets Saving for Akron Company

Suits brought by the Northern Ohio Power & Light Company, Akron, Ohio, in the federal court at Cleveland enjoining the collection of the 1925-26 utility taxes in Summit and other counties of Ohio have been settled. Under the settlement the company saves about $125,000 on its Summit County taxes for the two-year period involved.

In its suits the Northern Ohio Power & Light Company contended that its property was listed for taxation at practically its full value, while other property was listed on a basis of 40 to 50 per cent. The company made it plain that it had no desire to evade its taxes, but contended that the valuation of its property should be reduced or the valuation of other property be raised.

Some counties settled with the company immediately, but others served notice they would contest. The move just made ends the controversy. On a showing recently made before the State Tax Commission that assessments against the company were excessive and unfair compared with other assessments throughout the state the board reduced the tax valuation for future assessments nearly $4,000,000.

Would Foreclose on South Bend Property

The Harris Trust & Savings Bank of Chicago has filed suit in the United States District Court at Grand Rapids to foreclose on $536,000 of bonds of the Southern Michigan Railway, controlled by the Chicago, South Bend & Northern Indiana Railway. The bank asks for an accounting of all property and interest on bonds, the appointment of a receiver and an injunction enjoining officers of the interurban company from disposing of any property.

Borrowing from Peter to Pay Paul in Seattle

For the first time since the Seattle Municipal Railway, Seattle, Wash., began paying on the principal of its $15,000,000 bonded purchase debt eight years ago, it will not be put on a warrant basis to enable it to meet an installation due next March. Not that Seattle has the money ready, but simply that city officials plan to borrow from the Light and Water Departments since $4,000,000 of Light Department bonds were sold recently and not all of the money acquired through these bonds will be required by the Light Department for some time.

Last year loans totaling $600,000 were negotiated to tide the railway over after the banks of the Seattle Clearing House Association declined to cash the warrants issued to meet salary checks for the Dec. 24 payroll. The warrants carry 6 per cent interest, which interest, it is ingeniously explained, would be

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paid by the railway on any sum it might borrow from the light department to tide the railway over.

Cars and Trestle on Deferred Payment Plan in Seattle

Seven members of the City Council of Seattle, Wash., and Mayor Bertha K. Landes have informally agreed to have C. W. McNear & Company, Chicago, purchase fifty new cars for the Seattle Municipal Railway and build a $715,000 trestle over the West Duwamish Waterway and lease both the cars and the trestle to the city of Seattle.

As a result of the agreement, a resolution stating that it is the intention of the Council to enter into an arrangement of this kind will be introduced at a special meeting of the Council shortly. Meanwhile Corporation Counsel T. J. L. Kennedy will be asked to pass upon the legality of the proposed contract.

The Pacific Car & Foundry Company, Seattle, is to be awarded the order for the cars while the trestle contract is to be let to a Seattle concern, if possible. McNear & Company proposes to lease the cars to the city for fifteen years under an arrangement by which the city will pay $50,000 a year during the first four years, and $120,000 a year during the next eleven years. At the expiration of the lease the cars would become the property of the city. An annual toll charge would be paid by the city during the twenty years of the lease of the trestle, the city taking over that structure at the end of that period.

Mayor Landes points out that this form of contract would probably cost the city more than if the cars and trestle were obtained by a straight bond issue, but with the present litigation in which the railway is involved, it has been found impossible to market railway bonds to provide the money needed for the cars and trestle.

Rochester Goes Slightly Behind

Street railway commissioner's report for year ended July 31 shows 3,781,385 fewer passengers with company $60,128 behind allowed return. Fares increased to 9 cents recently

CHARLES R. BARNES, city railways commissioner of Rochester, N. Y., has filed his report covering bus and trolley operations of the New York State Railways under the service-at-cost contract for the year ended July 31. His summary of operations shows 3,781,385 fewer passengers carried than during the previous year. The total number for the year ended July 31, 1926, is 91,717,817, while the total for the twelve months ended July 31, 1927, was 87,936,432.

The company failed by $60,128 to earn its guaranteed return last year. The accumulated deficit is $341,782.

In his report, Mr. Barnes commented on the increasing use of automobiles as hurting the company's revenues and branded as unfair the system whereby the railways must bear the cost of paving, which, he believes, should be levied on all taxpayers. He blames this situation for the recent increase in Rochester fares from 8 to 9 cents and deems it unfair that the street car riders must bear the burden.

In commenting on this condition, James F. Hamilton, president of the New York State Railways, said to a Rochester representative of the ELECTRIC RAILWAY JOURNAL:

Something must be done if street car companies are to conduct their business successfully. This cannot be accomplished unless the fare is kept low to encourage mass riding. Each year fewer riders are carried. The car rider must be protected from unjust distribution of paving costs.

Commissioner Barnes said that the profitable operation of buses depended on greater general use by the public. In this connection he said that the fact that riders on the trackless trolleys and on the buses are steadily increasing in number in the face of the decrease in trolley riders, which has been continuous throughout the life of the contract, is regarded as demonstrating a real necessity for this supplementary service. Mr. Barnes said in part:

To care for the travel 9,544,212 car miles were run with mileage for trackless trolleys totaling 230,790, and with bus mileage of 408,207. Generally speaking, the trolley mileage has been maintained up to the standard established in prior years. The mileage run by trackless trolleys and buses was increased substantially, the increase for trackless trolleys having been 10,567 miles, or approximately 5 per cent, while the mileage on the bus line was increased during the year almost 70 per cent, due principally to additional routes. The mileage of the operating system at the close of the year ending July 31, 1927, was as follows:

Trolley car trackage	169.14
Trackless trolley routes	2.75
Gasoline bus routes	58.35

The result of operation for the year showed for railway lines a profit of $1,611.51, but a deficit from supplementary service totaling $61,740 left an aggregate deficit for the year of $60,128, and an accumulated deficit at the end of the year of $341,462.

Among the outstanding items which have been increasingly manifest during the past year the following may be mentioned:

(a) Material improvement has been made in the condition and appearance of the rolling stock, and especially during the past year, to such an extent that at present the equipment meets, all of the requirements of safety, comfort and convenience of passengers.

(b) Substantial improvement has taken place in connection with the equipment and program for car heating, an item which is very necessary in connection with the health and well being of the car riders.

(c) The car lighting has been definitely improved and sufficiently to warrant the assertion that the street cars in Rochester are now really illuminated.

(d) Extensive reconstruction work was done during the year, including Main Street West, Main Street East, Plymouth Avenue and Lyell Avenue. In addition a large amount of money was expended in track and pavement maintenance throughout the system generally.

(e) As mentioned previously herein, the

REPORT OF ROCHESTER RAILWAY FOR YEAR ENDED JULY 31

Revenues from Transportation:	Railways	Bus Lines	Combined
Passenger revenues	$5,161,261	$118,875	$5,280,136
Chartered car revenues	3,000	.....	3,000
Bus rentals	.....	1,855	1,855
Mail revenues	87	.....	87
Miscellaneous transportation revenues	1,745	132	1,878
Total revenue from transportation	$5,166,095	$120,862	$5,286,958
Revenues from Other Railway Operations:			
Station and car privileges	$60,685	.....	$60,685
Rent from tracks and facilities	35,002	.....	35,002
Rent from buildings and other property	22,234	.....	22,234
Miscellaneous operating revenues	.....	1,271	1,271
Total revenue from other railway operations	$117,921	$1,271	$119,193
Total operating revenues	$5,284,017	$122,134	$406,151
Operating Expenses:			
Maintenance of ways and structures	$478,086	.....	$478,086
Maintenance of equipment	398,389	.....	398,389
Power expenses	289,067	.....	289,067
Conducting transportation	1,667,279	.....	1,667,279
Traffic expenses	10,370	.....	10,370
General and miscellaneous expenses	552,803	.....	552,803
Renewals and depreciation	360,000	.....	360,000
Total operating expenses	$3,755,996	$167,817	$3,923,814
Net operating expenses (deficit)	$1,528,020	$45,682	$1,482,337
Auxiliary operating revenues	$2,908	.....	$2,908
Auxiliary operating expenses	3,519	.....	3,519
Auxiliary operating deficit	$610	.....	$610
Net revenue—All operations (deficit)	$1,527,409	$45,682	$1,481,726
Taxes assignable to operations	352,213	1,896	354,110
Operating income (deficit)	$1,175,196	$47,579	$1,127,616
None-operating income	4,217	.....	4,217
Gross income	$1,179,414	$47,579	$1,131,834
Return on investment	1,177,802	14,160	1,191,963
Service-at-cost operating surplus or deficit	$1,611	$61,740	$60,128

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mileage made by trackless trolleys and gasoline buses has been materially increased.

(f) During the year there were no material changes in car routeing. Some minor changes were made in car stops.

(g) During the year there were no extended interruptions to service resulting from failure of power supply.

No change in the rate of fare charged was made in the year ended July 31, 1927, although in accordance with the terms of the contract, an increase in fare was warranted. Subsequently and since the close of the year, the company served notice of a fare increase which became effective as of Dec. 1, 1927. Even with this later increase, the cash rate of fare charged in Rochester remains lower than it does in any other large city in the State, except New York City, and also remains lower than in practically all other large cities throughout the country. That in its fare increase Rochester has been consistently behind the rest of the cities was due to two things: First, the economical operation which has been possible under the terms of the contract, and secondly, the reluctance of the company to insist upon an enforcement of the terms of the contract while there was any hope that conditions would change in such a way as to make an increase unnecessary.

The increase in the rate of cash fare from 8 cents to 9 cents took effect after the close of the fiscal year but because of that increase in rate, it is deemed pertinent and advisable to refer to what was set forth in the previous annual report on this important factor in the raise of fare, viz.: The unjust charge borne by the street car riders for paving the streets of the city, which pavement they do not use. While the former report dealt in detail with this subject, general discussion of it has been so extensive that it is believed the public generally are convinced of its injustice, and it is hoped that corrective measures will be taken in the near future to relieve the car rider of this burden. The recent increase in rate of fare brings the subject directly home to the car riders, as, were it not for the amount of money spent for the purpose of paving, the deficit which caused the increase in fare would not exist. This burden on the car riders is not a condition confined to operation under the service-at-cost contract. In some cities the law has been modified relieving transportation systems of paving costs, but in all other cities these paving expenses affect the rate of fare paid by the car riders.

In the report for the year ended July 31, 1926, considerable space was devoted to the underlying need for additional transportation facilities, and to the considerations which have been developed to increase the service by means of trackless trolleys and gasoline buses. It was then said that under circumstances such as were in force in Rochester, supplementary service of the character required only infrequently paid their full way from the start. That there was a need for service of this kind has been amply demonstrated by the results of operation for the past. During this time the volume of such travel steadily increased, that on the gasoline buses being double what it had been during the first year of gasoline bus operation, while the trackless trolley volume increased more than 10 per cent.

This business has not as yet reached a point where it is paying its way in full, but having in mind the substantial benefits which this growth of service has conferred upon the city at large, by way of increased availability and flexibility of service, it has justified itself.

Personal Items

D. Boal Succeeds E. J. McIlraith in Chicago

Daniel Boal, formerly assistant superintendent of schedules and time-tables of the Chicago Surface Lines, Chicago, Ill., was appointed superintendent of the department on Dec. 1 to succeed E. J. McIlraith, acting superintendent. Mr. McIlraith continues as staff engineer of the company.

The new superintendent entered the service of the Chicago City Railway (the south side lines) in 1902, as a window washer, and was later transfer clerk, working nights. At the same time he was attending the University of Illinois medical school, from which

Daniel Boal

institution he was graduated in 1906. In 1909 Mr. Boal went to Seattle, Wash., where he entered the mechanical department of the Seattle railway system, then known as the Seattle Division of the Puget Sound Traction, Light & Power Company. The following year he accepted a position in the schedule department of the company, where he remained until 1919. In that year he went to the Philadelphia Rapid Transit Company, and remained with that company for one year. Returning to Seattle in 1920 Mr. Boal remained there until May, 1923, when he entered the schedule department of the Chicago Surface Lines as assistant to Mr. McIlraith.

Personnel Changes in Minneapolis Suburban Line

At a special meeting on Dec. 5 H. E. Pence was elected president of the Minnesota Western Railroad and the Electric Short Line Terminal Company. He is president of the Minneapolis, Northfield & Southern, which recently acquired control of the two other companies. W. R. Stephens was made vice-president of the two lines, E. C. Bahr secretary-treasurer of the Minnesota Western and F. C. Malcolmson of the Electric Short Line Terminal Company. The terminal is used by the Anoka and the Cuyuna Range trolley line trains as well as the gaso-electric passenger trains of the Southern and the Western lines, which are three suburban railways operating north, south and west.

A Railway Specialist Inspires News Writer

Col. William C. Lancaster, grade crossing protectionist and electric railway specialist, was made the subject of a personal sketch in the Brooklyn *Eagle* for Nov. 13. Colonel Lancaster has done many big things in tunnel construction work, ship enterprises and power development, but electric railways are his hobby.

At the present time he is with the New York Transit Commission applying his knowledge of electrical and civil engineering in the post of chief engineer. He has charge not only of all the engineering work in connection with the regulation of New York City's rapid transit and surface lines but also of the grade crossing elimination program for the five boroughs of the city. He is chairman of a committee designated to investigate the practicability of a lighter steel car to operate on New York City's elevated structures where wooden cars now operate, because the structures are not strong enough to carry steel cars of the present design.

Among his other accomplishments Colonel Lancaster helped to work out plans for equipping many of the rapid transit lines in New York City with automatic block signals and designed a system of gauntlet tracks on the lines running into Queens. From Havana to Canada Mr. Lancaster is known for his constructive genius and initiative in carrying through some important construction projects.

L. C. Singleton is the new superintendent for the Eastern Texas Electric Company, Beaumont, Tex. He succeeds Charles A. Brann. Mr. Singleton has been with the Eastern Texas Electric Company in Beaumont since 1919 in the capacity of claim agent and safety director. He plans to carry out the work of improvement started by his predecessors.

Dwight Foust, a former dispatcher of the Northern Ohio Power & Light Company, Akron, Ohio, has been chosen instructor of the permanent training course for the electric railway operators of that railway. He will have charge in Akron, Canton and Massillon. Mr. Foust is a graduate of Wittenberg College. He began train service in Canton. Later he was transferred to Akron, being promoted from trainman to dis-

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patcher for his outstanding efficiency. Mr. Foust has been dispatcher in the Kenmore yards for several years.

FRED E. SWAIM, a public accountant of Huntington, Ind., has been appointed assistant in the accounting division of the Indiana Public Service Commission. Mr. Swaim succeeds R. L. Gwinn, recently resigned.

F. W. ALLARD, formerly first aid instructor of the roadway department of the Georgia Power Company, Atlanta, Ga., has been appointed director of all safety work in the roadway department. Mr. Allard succeeds W. J. Adams, resigned.

FRANK T. SINGLETON, chairman of the Indiana Public Service Commission, has been selected as one of the directors-at-large of the National Safety Council, it has been learned in Indianapolis. Mr. Singleton's term is for three years. Since he was chosen as safety member of the Indiana commission in 1924 he has taken an active interest in safety measures, particularly those pertaining to public utilities.

ROBERT L. BEYERLE has been selected general foreman of the Silver Lake Junction shops of the Northern Ohio Power & Light Company, Akron, Ohio, in place of Fred J. Sarbach, who died recently. Mr. Beyerle has been with the company since 1910 with the exception of one year, in which he was in the aviation corps as a mechanic. He was born in Ohio. His predecessor was foreman of the Silver Lake shops for several years.

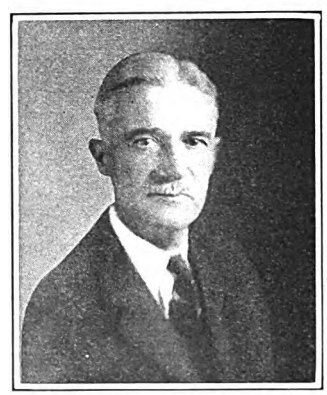
HUGH DOAK has been appointed assistant director of the Tennessee Public Utility Information Bureau, according to announcement by Guy P. Newbern, director. Editor of the Manchester *Times* and State vice-president of the National Editorial Association, Mr. Doak is a newspaper man with more than twenty years experience, having started his newspaper career on the *Cannon Courier*, Woodbury, Tenn., in 1905. He worked on various other Tennessee newspapers and for a time was in the commercial printing business in Nashville. In 1913 he purchased the Manchester *Times* and has operated that newspaper since. Mr. Doak will retain his newspaper interest as owner and editor of the Manchester *Times*, in addition to his new duties.

W. H. SWINNEY of New York City is now serving as comptroller of the West Penn Electric Company and subsidiary companies with his office in Pittsburgh, Pa. Prior to his joining the West Penn, Mr. Swinney was associated with the American Telephone & Telegraph Company, serving for three years as staff accountant to the comptroller at the New York office. Mr. Swinney's previous business connections were with the Interstate Commerce Commission at Washington, with which he worked for ten years, in the latter period as assistant director of accounts. He also served as traveling auditor for the St. Louis Southwestern Railway, with office at St. Louis. He is a native of Florence, Tex. He received his education at Lockney College in that state.

H. H. Hanson Heads Middlesex & Boston Street Railway

Harry H. Hanson, who has served as vice-president and general manager of the Middlesex & Boston Street Railway, Waltham, was elected president of the corporation effective on Dec. 1. In this capacity he succeeds Pitt F. Drew, who has been chosen chairman of the board of directors.

Mr. Hanson entered railway work in 1889 as a conductor for the Boston Elevated Railway. Through the various grades in the operating department he advanced, becoming district supervisor in 1901, at the Dudley Street terminal, Roxbury district. In 1913 he was appointed superintendent of District No. 2, and served in this capacity until he



H. H. Hanson

was transferred to work of more responsibility. He served as superintendent of Division No. 7 for two years, with headquarters at Cambridge. Mr. Hanson became general superintendent of the Middlesex & Boston Street Railway in 1919, continuing in that capacity until his promotion to the general managership in 1920.

OBITUARY

Gen. Charles Miller

Gen. Charles Miller, 84 years old, retired oil millionaire and one of the founders of the Galena Signal Oil Company, died at his home in Franklin, Pa., on Dec. 20.

General Miller until eleven years ago was president of the Galena Signal Oil Company, and a son, J. French Miller, is now secretary-treasurer. He was Franklin's foremost resident, noted for his liberality and for many and varied interests. Heart disease was the cause of death.

He came to the United States from Alsace, France, his birthplace, while still in his teens, and his first occupation was selling sewing machines. His business career was interrupted by his service with the Union Army during the civil war and since that time had shown a keen interest in military affairs. Franklin's first modern hotel, the Alsace, was built by the General.

At the time of his death he was president of the Lake Erie, Franklin & Clarion Railroad, which he built 22 years ago; president of the Franklin Railway Oil Company and of the General Manifold Printing Company. He had an interest in the Hotel Latham of New York city and was a frequent business visitor in New York.

Harvey Hubbell

Harvey Hubbell, president of Harvey Hubbell, Inc., Bridgeport, Conn., manufacturer of electrical devices, died on Dec. 17 at his home in that city. A leader in the machinery field, Mr. Hubbell had to his credit more than 100 patents for his inventions making for the perfection of electrical switches and sockets and machine tools. He was born in Brooklyn, N. Y., and received his technical education at Cooper Institute in New York. His early experience was obtained with builders of printing presses and in ship and marine engine works. In 1888 Mr. Hubbell removed to Bridgeport to establish a small plant, and seventeen years later he incorporated the business, of which he was president for many years, under its present name.

E. P. Morris

Elmer P. Morris, 65, died on Dec. 11 at his home in East Orange, N. J. For a long while he was head of E. P. Morris & Company, New York, dealers in railway equipment. In 1889 the Cincinnati Street Railway, then the Cincinnati Traction Company, decided to electrify its horse car line on Colerain Avenue for a distance of about 6 miles. Bert Baldwin was employed to study the few electric railway lines then in operation in the United States and following his recommendations contracts for the Cincinnati work were awarded to the Thomson-Houston Company, Lynn, Mass., now a part of the General Electric Company. It was Mr. Morris, then employed by the Eastern company, who is said to have decided upon the double trolley system, still in use in Cincinnati. Later, Mr. Morris established himself in business in Cincinnati, but subsequently he returned to the East.

LOUIS A. CHRISTIANSEN, principal of the Corporation Service Bureau, Cleveland, Ohio, died recently. Mr. Christiansen was a member of the American Electric Railway Association for a number of years and was known for his work as an investigator. In solving problems of all sorts he cooperated with a number of electric railway officials. The Corporation Service Bureau will continue to operate as it has in the past.

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Manufactures and the Markets

No Cars Destroyed in Recent Ohio Carhouse Fire

No cars were lost in the recent fire which destroyed the carhouses and shops of the Columbus, Delaware & Marion Electric Company at Stratford, near Delaware, Ohio. Recent advices are that temporary buildings are practically completed for handling and running repair work.

Stock Dividend Declared by Ohio Brass

The Ohio Brass Company, Mansfield, Ohio, has declared a 20 per cent stock dividend on class "A" and "B" shares, payable in class "B" shares to stock of record Dec. 27. The company also declared quarterly dividends of $1.25 on the class "A" and "B" stocks and $1.50 on preferred, payable on Jan. 15 to stock of record of Dec. 31. The new class "B" stock will participate in the dividend.

Kansas City, Leavenworth & Western Gets New Cars

Four new cars embodying the latest features of safety, comfort and economy in electric railway equipment were recently introduced by the Kansas City, Leavenworth & Western Railway, Kansas City, Kan. The order for these cars was noted in the ELECTRIC RAILWAY JOURNAL Aug. 13 and description, specifications, elevation and plan appeared in the Nov. 5 issue.

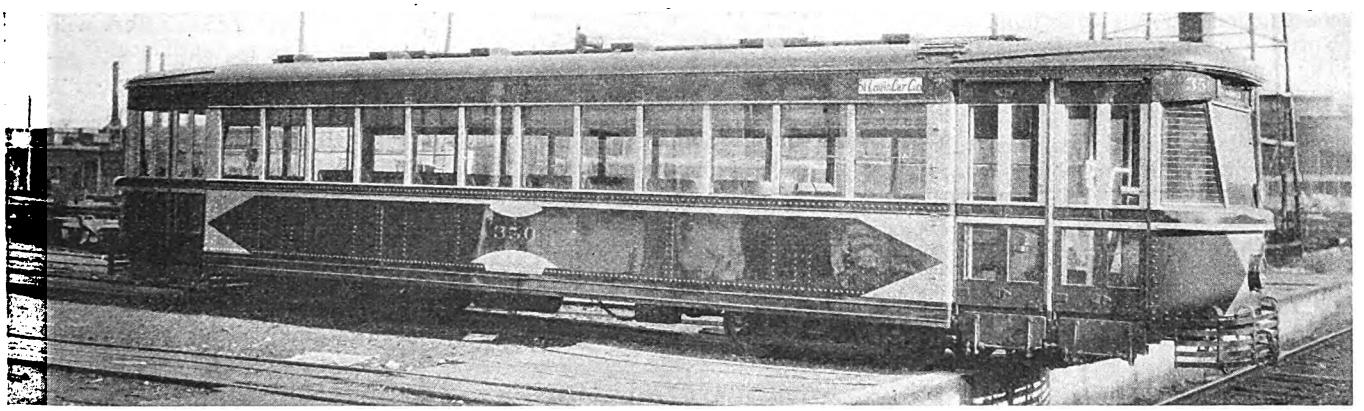
The installation of these cars, it is reported, climaxes a year's activity in which $100,000 has been spent rehabilitating the line.

V.E.P. Expects Recent Bus Order Deliveries in January

Bus equipment ordered recently by the Virginia Electric & Power Company will be delivered early in January, company officials expect. The ten new buses ordered, at a cost of $120,000, will have seats for 40 persons each.

One of the new type of vehicles which has arrived resembles a one-man street car. Its motor is located in the center of the vehicle to reduce the wheelbase. Some of the 29-passenger buses now in operation here, it is reported, have difficulty negotiating turns at narrow street intersections.

Five One-Man, Two-Man Cars Received by East St. Louis & Suburban

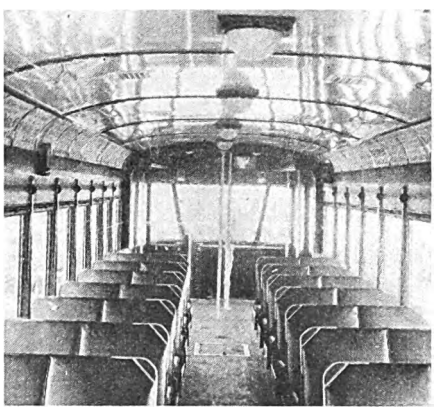


Typical exterior of the five new one-man, two-man city type cars recently put in service by the East St. Louis & Suburban Railway, East St. Louis, Ill. Note the streamline effect obtained by the color scheme

FEATURED with a parade headed by Mayor Frank Doyle and other city officials, five one-man, two-man, city type cars were inducted into service Nov. 23 by the East St. Louis & Suburban Railway, East St. Louis, Ill. The cars, which were ordered from the St. Louis Car Company early in the summer and for which specifications were printed in the JOURNAL for July 9, will be used on the State Street and 42d Street lines. One of these cars was exhibited at the Cleveland convention last October under the name of the "President's Car" or "Rail Sedan." When placed in service the new cars were operated free of charge during the first day. The units supplement the service of six rebuilt cars which were put in operation May 7.

Subjoined are specifications:

Number of units	Five
Type of unit	One-man, two-man, motor passenger, city, double-end, double-truck
Number of seats	48
Builder of car body	St. Louis Car Co., St. Louis, Mo.
Date of order	May 24
Date of delivery	October, 1927
Weight, approximately	32,000 lb.
Bolster centers	22 ft.
Length over all	47 ft. 3 in.



Ample aisle room, light, and comfortable leather-covered seats are some of the features of the new East St. Louis cars, which were built by the St. Louis Car Company

Length over body posts	31 ft. 4 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. 6 in.
Window post spacing	2 ft. 6 in.
Body	All steel
Roof	Arch
Doors	End, folding
Air brakes	Westinghouse
Axles	Heat-treated
Car signal system	Faraday
Compressors	DH-16
Control	K-75, low level
Curtain fixtures	National Lock Washer
Curtain material	Pantasote No. 86
Destination signs	Hunter
Door mechanism	National Pneumatic
Energy-saving device	Economy meters
Finish	Enamel
Floor covering	Linoleum
Gears and pinions	Tool Steel Gear & Pinion Co.
Glass	Plate in side windows; non-shatterable in vestibule
Hand brakes	St. Louis Car Co.
Hand straps	Electric Service Supplies No. 26572
Heaters	Consolidated
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Plain 3½ in. x 7 in.
Journal boxes	St. Louis Car Co.
Lamp fixtures	Safety Car Lighting, dome fixture
Motors	General Electric No. 264, inside hung
Sash fixtures	Dura
Seats	St. Louis Car Co., leather reversible
Seat spacing	30 in.
Seating material	Genuine Spanish leather
Steps	Folding
Step treads	Feralun
Trucks	St. Louis Car Co. EIB 64
Ventilators	Nichols-Lintern
Wheels, type	Rolled steel, diameter 26 in.
Special devices	Oakelite; National Pneumatic treadles; variable load brake

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$900,000 New Equipment Program of North Shore

New equipment and rolling stock costing more than $900,000, it was recently officially announced, are being built for the Chicago, North Shore & Milwaukee Railroad, Chicago, as a part of an extensive program of enlarging facilities in all branches of its service. The equipment is of the latest design and all of the units are scheduled to be in service by next summer.

The largest single item in the program consists of fifteen all-steel, passenger, motor cars ordered from the Pullman Car & Manufacturing Corporation, Chicago, on Oct. 1 and reported in the ELECTRIC RAILWAY JOURNAL Oct. 22. The cars will be equipped with individual bucket type easy chairs upholstered in gray byzantine plush. One of the cars will be equipped with Hyatt roller bearings to test the riding comfort of cars thus equipped in high-speed electric operation. There will be two toilets and a smoking compartment in each car. Deliveries are expected next May.

Two additional dining cars and another parlor-observation car of all-steel construction are also being built for the North Shore Line at the Pullman plant. The diners seat 24 persons each. The cars are to be delivered to the road next May.

The fifteen additional semi-trailers for freight service of 8-ton capacity, scheduled for delivery in December by the Trailmobile Company of Cincinnati, Ohio, are to be used in handling door-to-door shipments. The units are mounted and transported between stations on flat cars with the trailer wheels still attached and without any handling of merchandise from the time the shipment leaves the shipper's door until it reaches the consignee.

Three 5-ton gasoline tractors were recently delivered to the railway by the White Motor Company of Cleveland, Ohio, and are now in service. The tractors are used in hauling trailers to and from freight receiving depots in Chicago and Milwaukee. The North Shore Line is the first railroad in the United States, it is understood, to place flat car trailer equipment of this type in regular service.

The ten lightweight, double-truck, one-man, two-man safety cars ordered from the St. Louis Car Company for service on Milwaukee city divisions of the North Shore Line are expected to be delivered about the last of the month. Announcement of the placing of the order appeared in the July 16 issue of ELECTRIC RAILWAY JOURNAL. These cars, which are 51 ft. long, have a seating capacity of 56 persons each and the seats are upholstered in green plush. Designed for either one-man or two-man operation, the cars are completely equipped with safety devices. Two of the cars will be equipped with Timken roller bearings.

The two additional freight locomotives built by the General Electric Company, the first of their type ever constructed, are equipped for operation either on trolley or storage battery circuits. They are 40 ft. long and weigh approximately 131,000 lb. each.

Fifty New Cars for Seattle

The contract for fifty new cars intended for use on the Seattle, Wash., lines of the Seattle Municipal Railway is to be awarded to the Pacific Car & Foundry Company, Seattle, under a plan for financing to which reference is made elsewhere in this issue.

Twenty-seven Thousand Employees Bondholders

Twenty-seven thousand, or 42 per cent, of the employees of the General Electric Company in its service for six months or more are holders of about $30,000,000 face value of G.E. employees' securities corporation bonds, an average of approximately $1,000 per person. These bonds pay 6 per cent interest, but so long as the original holder remains in the employ of the General Electric Company an additional 2 per cent is paid by that company.

ROLLING STOCK

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY, Milwaukee, Wis., is equipping one of its interurban articulated dining and passenger car units with Hyatt roller bearings. The company has been using Hyatt bearings under one of its articulated city units for approximately two years.

SHOPS AND BUILDINGS

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY, Milwaukee, Wis., and its subsidiary, the Wisconsin Motor Bus Lines, it is reported, will house all of their buses operating out of Racine, Wis., in the new bus storage building being erected in that city at a cost of about $10,000. The building will accommodate 30 buses. It will measure 48 ft. x 150 ft.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Dec. 20, 1927
Copper, electrolytic, cents per lb.	13.675
Copper wire, cents per lb.	15.75
Lead, cents per lb.	6.50
Zinc, cents per lb.	6.00
Tin, Straits, cents per lb.	58.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin, Ill., screenings, Chicago, net tons	1.60
Central, Ill., screenings, Chicago, net tons.	1.50
Kansas screenings, Kansas City, net tons.	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.50
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	0.63

TRADE NOTES

WHITE COMPANY, Cleveland, Ohio, has recently announced the following promotions: W. C. Pahlman, manager of the company's branch at Wichita, Kan., to manager at Oklahoma City; E. O. Bittner, former Tulsa, Okla., company salesman, to manager at Wichita.

HYMAN-MICHAELS COMPANY, Chicago, has recently been appointed sales agent for the Mid-West territory of the Ohio Locomotive Train Company and its subsidiary, the Toledo Crane Company, manufacturer of locomotive trains, overhead traveling and gantry cranes, steam, electric and gasoline operated.

AMERICAN HAMMERED PISTON RING COMPANY, Baltimore, Md., through W. C. Stettinius, president, has announced the election of T. Latimer Ford as vice-president. For a number of years Mr. Ford was assistant secretary and treasurer of the company and for the past four or five years has had charge of the Pacific Coast territory. In addition to his executive duties he will have charge of automotive replacement sales. His headquarters will be at the main office in Baltimore.

LUDLUM STEEL COMPANY, Watervliet, N. Y., has issued a loose-leaf booklet which it advises is devoted to a treatise on the new Nitriding process for the hardening of steel. The publication is entitled "Nitrolloy and the Nitriding Process." The following subjects are taken up in six chapters: "Nitralloy and the Nitriding Process." "The Analyses of Nitralloy," "The Physical Properties of Nitralloy," "The Operations Prior to Nitriding," "The Nitriding Process and Equipment" and "The Properties of the Nitrided Case." It also contains a tabulation of nitralloy-physical properties as well as some charts.

ADVERTISING LITERATURE

ELECTRIC SERVICE SUPPLIES COMPANY, Philadelphia, Pa., has issued an illustrated folder descriptive of its Golden Glow headlight.

IRVING IRON WORKS COMPANY, Long Island City, N. Y., has recently issued an illustrated bulletin, 2D, descriptive of its "Safkar Safstep."

ARMCO CULVERT MANUFACTURERS ASSOCIATION, Middletown, Ohio, has recently issued a booklet entitled "Paving the Culvert to Combat Erosion."

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has sent out looseleaf bulletins GEA-37B and GEA-528A, descriptive of direct-heat electric furnaces types AD, RRB and RRC and centrifugal air compressors, small, multi-stage respectively. It has also issued another looseleaf bulletin, GEA-573A, entitled "Automatic Switching Equipment," covering synchronous converters in railway service.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 70 New York, Saturday, December 31, 1927 *Number 27*

Overlapping Sectional Meetings Cut Attendance

ON SEVERAL occasions the JOURNAL has called attention to the overlapping of sectional association meetings. During the month of January there are scheduled four such meetings, each of which interferes with one or more of the others. This is undesirable from several standpoints, most important of which is the reduction of attendance at the meetings themselves.

Manufacturers in particular suffer from this unfortunate circumstance. Instead of covering several sectional meetings by routing a man so as to attend them on one trip, it frequently becomes necessary to send out several men for long distances, or to omit attendance at one or more meetings. This does not apply only to manufacturers. In some instances alert operating organizations send men outside the confines of their own territory to attend neighboring sectional meetings. Overlapping dates discourage such a progressive policy. Again, there has grown up during recent years the desirable practice of inviting officers or staff members of the American Association to address sectional meetings. Simultaneous meetings in several widely separated locations sometimes make it impossible for association executives, who would otherwise do so, to lend this desirable co-operation.

In the last analysis, offending associations are themselves the greatest sufferers from carelessness in setting meeting dates. In rare instances these dates are fixed in the association's constitution or by-laws. When that is so there seems to be no good reason why two overlapping associations should not take up this matter with each other and agree upon changes to be made in their constitutions at the first opportunity. Most conflicts, however, are attributable to lack of proper checking when the dates for meetings are fixed by executive committees.

The JOURNAL has endeavored to aid in relieving this situation through publication every week of meeting dates as promptly as they are announced. These dates are carried in the calendar every week until the meeting is held. The JOURNAL will be glad to co-operate further with sectional associations by answering promptly any inquiries regarding conflicting dates at the time a sectional meeting is being planned.

Regulation of Interstate Motor Carriers an Issue Again

CONGRESS again has before it the question of the regulation of buses and trucks engaged in interstate commerce. The two bills so far presented are the so-called Parker and Dennison measures, but the House committee on interstate and foreign commerce will not act on any bill until the report of the Interstate Commerce Commission on Docket 18,300 is presented. Oral argument on the commission's docket is now set for Feb. 10.

Opinion appears to be as divided as ever about the need of regulation and the methods that should be adopted to bring the interstate carriers within regulative purview greater than that afforded the states at present through the exercise of their police powers. The far-fetched view, perhaps, is that need for regulation does not exist. The saner view is the one which has as its object a measure of regulation that will not have the effect of strangling the development of the industry. Each plan so far advanced has its able advocates. There may be good reasons for the advocacy of the plan of conferring jurisdiction on the local commissioners, with the I.C.C. as a court of last resort only in the event that matters in dispute cannot be otherwise settled.

It is, of course, too early to attempt to predict the probable outcome. The position of the electric railways in the matter has been stated in their brief. If the opinion of Interstate Commissioner Esch is a criterion, then that body is not in sympathy with the idea that regulation of the interstate bus carriers should be deferred. According to him, had Congress regulated traffic by rail carrier years earlier much of the time and labor of the I.C.C. might have been avoided, and many actions now brought to the commission for consideration might have been obviated. Certainly regulation is the order of the day. The many electric railways that have supplemented their rail service by the operation of buses have sought authority from the states or municipalities, and it is true that such operation by the electric railways is frequently subject to competition from bus lines engaged in interstate business and subject only to the local police power.

Despite the need of protecting the electric railways, the steam lines and the certificated bus lines from encroaching upon each other, it is important that grave injustice be not done to one or more of these interests. Even a continuation of the present unsettled state, deplorable in many of its aspects, is better than ill-advised legislation that might work hardships greater than the evils it was intended to correct.

Schedule Speeds Can Be Improved

SCHEDULE speeds on many electric railways have not seen improvement commensurate with the trend of the times or the demands of the public. While this is true of some large properties, it is particularly noticeable on the smaller systems. Unfortunately, it is in the small cities that the need for improvement is most apparent. As a rule, in the small cities the speeds always have been lower than in the large ones. It is in the small cities that the opportunity for active competition by the private automobile is greatest. The small systems with infrequent service and short runs do not, of course, give the opportunities for saving cars by speeding up that are evident where the headways are close and the lines

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are long. Often the remark is made by a manager that the operators might just as well be spending their time in dragging their cars over the road as to hurry through and then loaf at the terminals.

From a standpoint of manual efficiency this may be true, but from the standpoint of winning public support it is far from correct. One of the standing complaints of the railway patron is that while the street car is moving slowly and majestically along the street all the other traffic is passing by and leaving it in the rear. Even though it may be proved that the car gets to its destination only a minute or two later, that does not pacify the rider who is annoyed by the slowness of the car. After he has had his fill of it he buys an automobile. Soon he joins the ranks of the agitators who want the trolley tracks torn up.

As an indication of how bad the situation may be in some cities, and of how much it can be improved, the experience in Charleston, S. C., is worthy of note. Here the schedules a few years ago called for an average speed of 7.5 m.p.h. Contrast this with the 10 to 11 m.p.h. maintained on some of the largest metropolitan systems! Furthermore, only 77 per cent of the cars were on time. During the past four years the speed has been raised to 9 m.p.h., an increase of 20 per cent or one minute out of every five. While the trainmen declared it couldn't be done, the latest check showed that 95 per cent of the cars were operated on schedule. Most surprising of all, the increase took place while one-man operation was being largely extended, and while there was a marked increase in traffic congestion.

It is beside the point to argue that this required hard work. Of course it did. It required a good organization and the co-operation of every employee from the top down. The big point is that it could be done and that it was done. What is more, there is no inherent reason why similar results cannot be obtained in practically every city where the schedule speed is too low. And in the doing of it there is great reward.

Changing Conditions Affect Interurban Headlight Efficacy

PRESENT headlight equipment of interurban cars was designed principally to aid the motorman in detecting objects on the right-of-way. The headlight mounted atop the car roof may serve its primary function of illuminating the track ahead effectively for the motorman, but it is sometimes ineffective as a warning to the driver of a highway vehicle about to cross the track. The hazard of the highway crossing is one of growing seriousness, both on account of the increasing number of vehicles and in their greater speed and the apparent recklessness with which that speed is used by the driver. Conditions are worst at night, particularly when there are few vehicles on the road and they are driven at breakneck speed.

The motorist of today has learned to interpret traffic dangers in terms of light signals. With the advent of the closed types of automobiles auditory warnings have in a measure become ineffective. This is particularly true during inclement weather, when the vehicle windows are closed and the noises of the wind tend to mask the sound of a warning signal. Lights guide the motorist through the complexities of city traffic, and on the highway lights produced directly or by reflection mark road curves, S turns and other danger spots. They flash a visual message that is unmistakable in its import.

Under certain conditions the beam from the headlight on the roof of an interurban car may be out of range of the motorist's vision. Observation of cars approaching highway crossings at night under varying roadway conditions indicates the need for giving more careful consideration to the position of headlights on the interurban car than has been paid to the subject in the past. On some properties cars which use a brilliant headlight on the roof also carry a second headlight on the dash. In such instances the practice has been adopted rather to meet the conditions of operation on city streets than those presented by highway crossings on the open road.

In view of the increasing seriousness of the crossing hazard, this matter of headlight equipment for interurban cars seems worthy of serious study.

Prudent Stewardship Indorsed

CONFIRMATION of the disposition of its earnings has been rendered in favor of the management of the Third Avenue Railway, New York, by the United States District Court. In some respects the issues raised in this case appear to be purely academic, but they are, on the whole, much more than one for the technician. They relate to the rights of the management to retain funds which a holder of income bonds thought should have been applied to the payment of interest, accumulated to the extent of 27¾ per cent as of Sept. 24. The man who sued sought to estop the company from using the property of bondholders for capital purposes "in direct violation of the trust indenture securing the bonds." The management said that the indenture provided that disbursements on the bonds were at the discretion of the directors. Briefly, the position of the management was that it was acting fully within its rights when it withhheld payment of interest so as to conserve its cash for use in the emergency of the ever-changing railway situation in New York, but particularly to meet the contingencies before it in the franchise applications then pending for the right to run buses in the city.

The court has now held that the management did right in acting as it did. The court apparently did not pass upon the terms of the indenture under which the bonds are secured, but the ruling is no less clear on that account. Judge Knox held, in effect, that the company's position in the premises was justified, since with the bus lines in the hands of an antagonistic company the routes of the railway and the bus company would have been sharply competitive. The decision, however, is not one that might be construed as conferring upon companies having income bonds outstanding the right to pay or withhold interest at will. That was never the original intention of the income bond as a financial device, and any such construction would indeed be detrimental to the income bond as a very valuable form of financial media. The court merely ruled on the specific points raised, saying that the accounting sought by the plaintiff might show facts which would entitle him to relief, but that it was not satisfied, upon the basis of the present disclosures, that the plaintiff should have the injunctive relief he sought.

It would seem reasonable to assume, as has been pointed out before, that the holder of a security of this kind labors under no delusion about the type of security he is purchasing. He knows that financially its owner-

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ship implies hazards, and those hazards are lessened for him only as the management exercises caution. It might, it is true, seek as soon as possible to liquidate any payments that have accumulated and denude the property of cash so quickly as to leave it again in a position out of which grew the necessity for issuing the income bonds. If it did that knowingly it would not be true to its trust.

Under the circumstances in the Third Avenue case, it does not appear that any decision could have been reached other than that arrived at by the court. Certainly the management in this case was acting in the remote interest of the owner of the bond and in so doing was protecting him and his capital. The withholding of the interest payment was merely incidental to the larger and more important one of preparing the company to cope with a situation that arose. The attitude of the company toward the proposition was well advised, as the court ruling indicates.

Car Rider's Viewpoint Not Always Properly Understood

MANY managers of electric railways find that one of the most successful means of providing the service that the public wants is to put themselves in the place of their patrons. In other words, the executive of the company himself becomes a regular passenger on his own cars. Sometimes the plan is carried even farther, and members of the organization not directly connected with car operation are delegated to ride and to report on the desires of the public as well as possible sources of irritation and plans for their elimination. When this plan is followed it tends definitely to keep the management away from the frame of mind where the officials feel that they know instinctively what is best for the public, and propose to run their own roads regardless of what the riders think they want. When a plan of this kind is followed it may make for efficient operation. But there is more than mere efficiency to operating a transportation system successfully. The service must also be convenient and comfortable.

At times the requirements of efficiency in operation and passenger convenience conflict with each other. Then accurate knowledge of the car rider's viewpoint is indispensable. Determination of the correct procedure under such circumstances cannot safely be left to subordinate operating men. While the efficiency—or the lack of it—becomes a matter of record, the effect on public opinion is not definitely registered. For example, a car turned back short of its regular destination to fill in a gap in the opposite direction shows up well on the headway record for the day. But there is no way to chart resentment of the passengers compelled to change cars. Similarly, running by waiting patrons may tend to correct uneven spacing of cars and hence produce a good result on paper, but it produces an extremely bad effect on public relations. Even the railway manager himself would wax wroth if he stood on the street corner and was passed up by one of his own cars. Anyhow it would be worth a good deal to him to try the experiment himself and learn just how it seems.

These efficiency measures usually are adopted in the name of "the greatest good for the greatest number." In many instances their claim to accomplish that result is justified. But the individual passenger cares nothing about "the greatest good for the greatest number." He is thinking only of the greatest good for himself. One incident that inconveniences him makes a deeper impression than ten that benefit him. Often other corrective measures can be taken that will not discommode the patrons of the road. When it is necessary to discommode them, every effort should be made to inform them of the reasons for a change from normal operation. By so doing many a friend can be made—and in these days good will of the public, while hard to evaluate, is no mean asset.

An Obligation That Should Not Be Assumed Lightly

CONSIDERABLE attention has been given in recent months to plans for pensioning superannuated employees in all classes of American business. Irrespective of the desirability on social or moral grounds, it is a movement that has been gaining favor in many places. Looking at it in a dispassionate way, it is merely a plan to force the employee to save systematically whether he will or not. As it was pointed out in the article in this paper for Dec. 3 by E. C. McDonald, the plan is largely one for the actuary. With the same accuracy with which life insurance premiums can be calculated, it is possible to determine the amount that should be set aside each year to provide the needed fund at the retirement age to make payments to the beneficiary for the remainder of his life. There is no magic in it and virtually no guesswork.

When such an obligation is taken on by the employer, by the employee or both, it is necessary to be certain that it can be carried through without fear of failure. Of course, every cent that is set aside is saved, and nothing is lost, if the money is invested in such a manner that safety of principal is assured. It is when questions come up such as those raised in Australia, which were presented by W. O. Strangward, secretary of the Melbourne and Metropolitan Tramways Board, that a shadow of doubt arises whether both parties to the contract will be able to fulfill their obligations.

Mr. Strangward points out that the contribution of the company is really equivalent to deferred wages, and since it must come out of fares, it is doubtful if the rates can be raised sufficiently to produce the needed revenue. It is wrong to agree to the payment unless the accruals cover the entire term of service of the employee, as to defer them would be merely passing on to a future generation the duty of paying the employee, and would at that time make the burden so great that it might be irksome. Even when the payments are made from the beginning the amount is so great that it may cause distress.

In fact, in Australia itself the question of failure to accrue funds sufficient to care for pensions has already become apparent. For instance, in New South Wales the amount to be raised annually from employee contributions has been reduced greatly and the deficiency is to be made up by the state. Even though the plan has been in effect only a little more than ten years, the government is short by some £2,000,000 to £3,000,000, and is planning to refund the arrears over a long period of years.

In view of a situation such as this the greatest care should be taken before a pension system is undertaken. It must be fundamentally sound or it will be impossible to carry it through. Furthermore, the employee should be given to understand that it really is a plan to assist him in emulating the ant and not the grasshopper.

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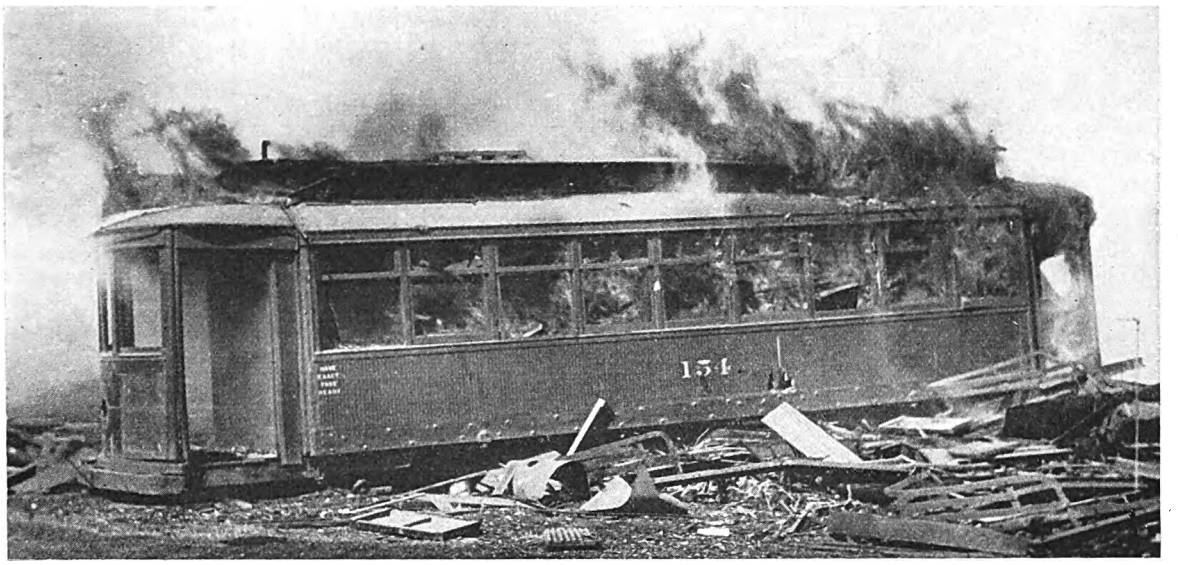
Atlanta Builds for the Future

With New Cars and Better Service

Convinced that modern equipment and improved service will ultimately win public patronage and support, the Georgia Power Company, in its brief for the Coffin Award, outlines the courageous policy that has finally brought an upturn in the earnings on its investment



Atlanta is doing more than its share to get rid of the 25,000 obsolete cars. Since 1921, 178 cars have been retired, 176 burned and two given away

CONFIDENT that new cars and, therefore, better service are the real answer to increased revenue and the ultimate support of the public, the Georgia Power Company, Atlanta, Ga., and its predecessor company, the Georgia Railway & Power Company, have been buying cars steadily since 1921, in the face of a declining curve of earnings on the investment. Some idea of the extent to which the present company believes in better service is gained from the knowledge that it has spent over five million dollars in service improvements since 1921, and the budget for 1927 will add more than a million and a quarter dollars to that already invested.

The present operating exceutives took charge in 1921 and almost immediately purchased 33 cars, followed in 1922 and 1923 by orders for twenty cars during each year. In 1925 sixteen new units were added and the following year saw seventeen additional new cars in service, bringing the total to 203 cars in 1926. As recently announced in ELECTRIC RAILWAY JOURNAL, the company placed an order this spring for 40 more units, which will bring the new equipment total to 243 cars purchased over a period of seven years.

The 1926 car orders place the Georgia Power Company in the position of having purchased nearly 2 per cent of all of the new passenger cars for city use that were bought in the United States during the last six years. The extensive car purchase program and the retirement of 178 old units has reduced the average age of the passenger equipment from 13.6 years in 1921 to 8.6 years in 1926.

The schedule of retirement of old cars, most of which were more than twenty years old, is as follows:

Years	Number of Cars Retired	Years	Number of Cars Retired
1921	10	1925	60
1922	..	1926	76
1923	20		
1924	12	Total	178

With the retirement of fourteen old cars this year and the placing in service of the 40 cars scheduled for delivery in September, the average age of all cars, city and interurban, will be 7.4 years. For the city cars only the figure is 7.7 years. This contrasts with the following figures: Dec. 31, 1921, 13.5 per cent of the cars in service were less than five years old. On Dec. 31 this year the rolling stock less than five years old, 210 cars out of 449, will be 46.75 per cent of the total on the property.

Some of the tangible results of the improvements made in Atlanta may be seen from a review of operating and revenue statistics which show the company's unswerving faith in its policy of concentrating on improved equipment and better service as the means of winning

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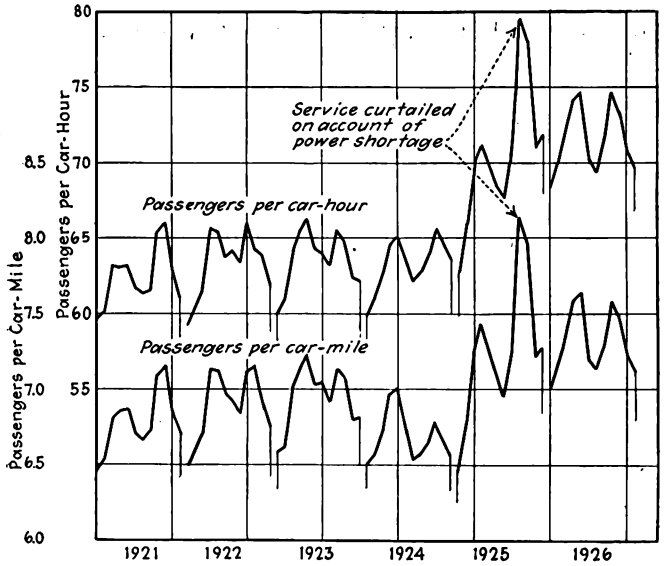


There has been an increase within recent years in passengers per car-hour and per car-mile

public patronage despite the fact that until 1926 revenues showed a downward trend. The per cent return on value of property from 1922 to 1926 follows:

1922	3.03	1925	1.32
1923	2.70	1926	2.34
1924	1.87		

From this it will be seen that the company lost ground steadily from 1922 to 1925, but that there has been a sharp upward trend in the return on the investment between 1925 and 1926, with the promise of a further climb during the present year.

Passenger Riding Increased

The record of passengers carried indicates the wisdom of the company's policy. The total number of passengers carried in 1926 was 96,794,273, as against 91,358,379 in 1921. Revenue passengers increased from 73,611,786 in 1921 to 75,901,241 in 1926. Taken by years, the total passengers carried were as follows:

1921	91,358,379	1924	92,029,437*
1922	92,172,664	1925	94,636,746
1923	95,357,117	1926	96,794,273

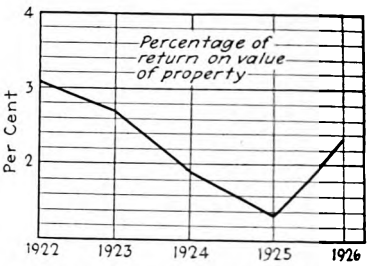
*Jitney competition.

The company's statement of gross revenue, total operating revenue, total operating expenses and net operating income before taxes for the years 1921-1926 inclusive are given in the accompanying table.

On the fourteen lines in Atlanta, where obsolete cars have been replaced by new cars, there has been an average increase in patronage of 4.73 per cent within three to six months following the installation of the units in service. The average increase on the balance of the system during this period was only 0.772 per cent. In the matter of increased riding as the result of new cars there is cited one route on which the installation of the new cars was followed by a business increase of 21.4 per cent for six months as compared with the corresponding period in the preceding year. On another route 13.5 per cent increase was obtained, while the system increase was 1.8 per cent. Increases of about 13 and 12 per cent, respectively, are shown on two other routes following the installation of new cars.

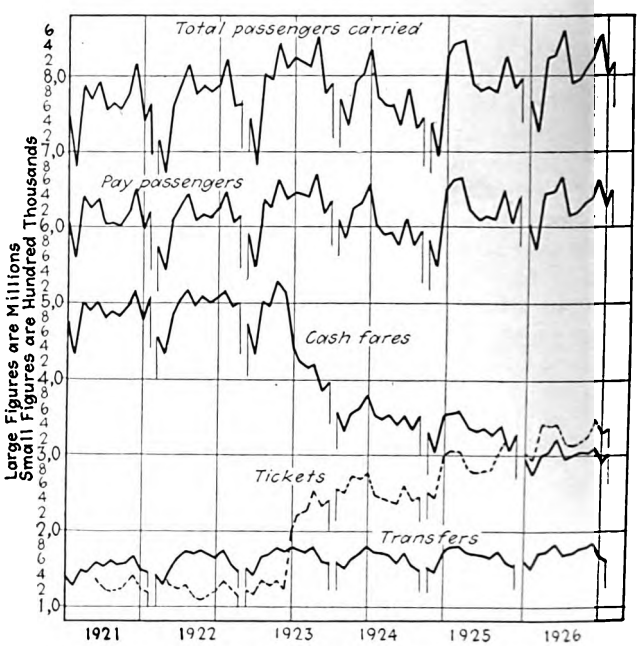
One-Man Cars Successful

When making its new car purchases the Atlanta company determined to give the one-man car a thorough test, a decision that has been productive of splendid results, both from the standpoint of increasing the car men's wages and solving the great Southern problem of race separation. Reduction of accidents also is attributed to the introduction of this type of car, which the company placed in service during 1925.



The percentage return on the value of the property is tending upward

At present 110 units in operation are arranged for one-man operation and the 40 new cars to be delivered this month are of this same type. Twenty additional cars which permit of ready conversion to this type will be changed during this year. One-man operation is used on all interurban lines and during rush hours 32 per cent of the service is of this nature. The management has found a $1,700 per car annual platform expense saving in one-man operation over two-man operation. After deducting interest charges and depreciation, approximately $720 per car per year has been saved. This



The line showing pay passengers carried has had a slow but continuous growth

GROSS REVENUE, OPERATING EXPENSES AND INCOME, 1921-26, GEORGIA POWER COMPANY

	1921	1922	1923	1924	1925	1926
Gross revenue from transportation	$5,160,784.85	$5,106,816.38	$5,244,204.79	$5,043,959.27	$5,134,918.60	$5,257,314.73
Total operating expenses	3,536,691.18	3,680,186.48	3,834,575.28	3,767,554.67	3,867,033.58	3,893,125.01*
Net operating income before taxes	1,624,093.67	1,426,629.90	1,409,629.51	1,267,404.60	1,267,885.02	1,364,189.72

* Includes $129,459.05 retirement expense and $43,500 rental of equipment, a total of $172,959.05 not charged to operating expenses in previous years.

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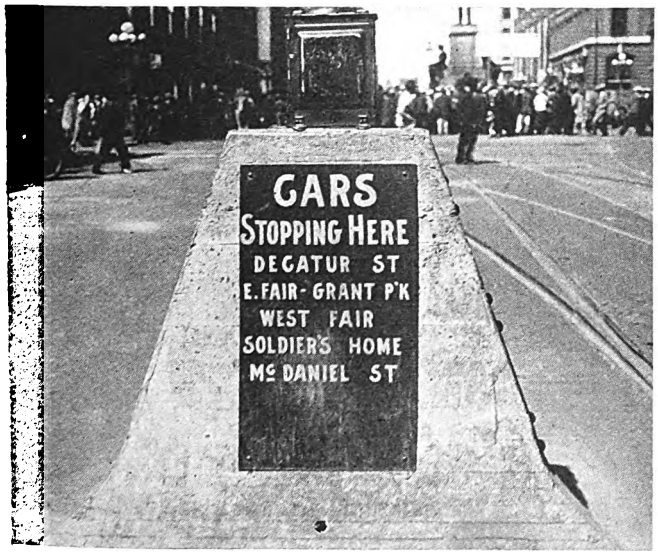
saving is allocated to give 50 per cent to the public in additional service, 25 per cent to operators in increased wages and 25 per cent to the company in increased earnings.

Every one familiar with the race question in the South knows that it is difficult, especially where congestion is present. The one-man cars adopted by the Georgia Power Company have the treadle step rear door mechanism. This has reduced race contact materially and has brought forth unqualified praise. With rear door operation there is no definite dividing line separating sections of the cars to be used exclusively by each race. The practice is for the negroes to occupy the seats from the rear forward, and the white patrons vice versa. Although at first it was found that the one-man type was productive of more accidents, familiarity of the public and trainmen with the new cars has grown to such an extent that in April, 1927, accidents on one-man cars were just about equal to those on two-man cars.

Perhaps one of the most interesting phases of the one-man situation in Atlanta was the lack of opposition encountered when this type of unit was first placed in service. The company took a novel means of introducing them to the public. This consisted of a contest to decide what color scheme the public liked best. Two of the cars were painted in the proposed new colors, green and cream and red and cream. One of the older cars was painted in solid green, the former color standard. These sample cars were placed in front of the company's building and the public was invited to cast ballots, the result being that more than 20,000 ballots were cast for the green and cream color scheme.

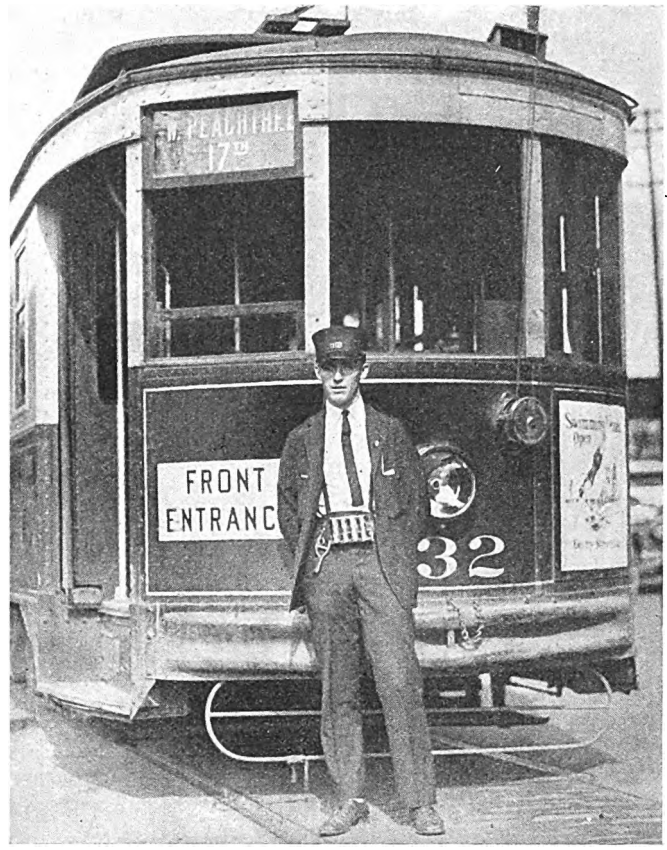
Among the 203 new cars purchased since 1921 are 100 double-truck, four-motor safety cars, with safety air brake equipment, door engines and treadle mechanism.



Car stop sign, with information on routes passing that point, attached to buttress of loading platform

There are 40 double-end cars with automatic couplers and air brake equipment for two-car-train service. Ten cars are of the single-end safety type with automatic couplers and air brake equipment for two-car-train service. Another twenty units are double-truck, double-end, two-man cars with straight air brake equipment and equipped with door engines and pneumatic control.

Replacement of ten old type interurban cars with lightweight one-man cars brought about a total reduction in car weight from 315 tons to 189 tons. All the new units



The low-floor, front-entrance type of one-man car which was recently put in service

have cheerfully finished interiors, wide aisles and thermostatic heat control. In the new interurban cars the de luxe appointments are much in evidence. Besides leather-upholstered individual seats the cars are provided with smoking compartments, generously upholstered arm rests, foot rests, dome lighting, parcel racks and ticket holders. On both the city and interurban units the side sheathing and door pockets are insulated with cloth and covered with canvas as a noise prevention feature.

With the exception of the cars purchased in 1921 all of the units have 26-in. wheels, insuring a comfortable step from the street level. Cars purchased in 1925 and 1926 and those now on order are of the same general design with the exception of twenty of the 1925 order, which were so designed as to make them easy of conversion to one-man operation. The popular type car in Atlanta is a 48-passenger, 46-ft. x 8-ft. car with 50-in. front door opening and 32-in. rear door opening. Electrical equipment consists of 35-hp. motors, K-75 low type control, line breakers and safety air brakes. The new interurban cars seat 52 passengers and weigh 37,800 lb. They are double-truck, four-motor units and have PC multiple-unit control for train operation and are equipped with Tomlinson couplers. The two-car trains have a seating capacity of 111.

This rolling stock serves a city system of 21 routes, thirteen of which are through routes. The remaining lines terminate in the downtown business district. In all, the Georgia Power Company operates 114 one-man cars, 239 two-man cars and 22 trailers in regular passenger service. It has a reserve of 26 single-truck cars, 24 double-truck open units for baseball and other special services, bringing the total to 425 units. This is exclusive of the 40 one-man cars now being constructed. Two interurban lines are operated, one to Stone Mountain, Ga., the

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site of the gigantic Confederate memorial; the other, the Atlanta Northern Railway, runs to Marietta, Ga. There are 85.817 miles of double track and 49.919 miles of single track in Atlanta. The Stone Mountain single-track line is approximately 10 miles long with turnouts. On the line to Marietta there are slightly over 14 miles of single track and a mile of double track.

Service Improved by Faster Operation

Several measures for evaluating the service improvements in Atlanta are available. In 1923 the average speed in miles per hour was 9.18 as compared to 9.77 m.p.h. in 1926. There has been an increase in the average operating speed from 9.47 m.p.h. in 1923 to 10.5 m.p.h. in 1926. As a corollary to the increase in speed there has been a marked reduction in schedule failures. In 1926 the loss from schedule speed was 4.54 per cent as compared with 8.63 per cent in 1923. The following tabulation is of interest:

OPERATING SPEEDS IN MILES PER HOUR, GEORGIA POWER COMPANY

	1923	1924	1925	1926
Revenue operating speed	9.47	10.00	10.47	10.50
Schedule speed	9.28	9.54	9.78	9.81
Actual speed	9.18	9.45	9.73	9.77
Loss from schedule	0.10	0.09	0.05	0.04
Per cent of loss from schedule	8.63	9.45	5.12	4.54

Again, the effect of better and more up-to-date cars was a substantial increase in the total seat-miles and in the average seat-miles per car-mile.

SEAT-MILES OPERATED, GEORGIA POWER COMPANY

	Total	Per Car-Mile
1921	506,283,880	37.55
1922	501,245,891	37.50
1923	516,894,356	37.70
1924	527,855,915	38.30
1925	525,528,959	40.30
1926	573,757,570	43.33

Improved equipment in Atlanta brought about a large decrease in service interruptions resulting from pull-ins. The car-miles per pull-in in 1926 were 26,041, as against 3,002 in 1921, and the average number of daily pull-ins last year was 1.39, compared to 13.2 in 1921. An important factor in getting these results is a rigid inspec tion and overhauling program maintained by the equipment department. The criterion for overhauling is the life of the armature bearings. Cars with Westinghouse No. 68 and GE-67 motors are overhauled every 40,000 miles. Those with Westinghouse No. 101, 306, 307, 514 and GE-80 every 50,000 miles and units with Westinghouse 548, GE-201 and GE-265-A are overhauled every 60,000 miles. Overhauling is extended to controllers, line breakers, trolley bases, resistance cables, governors, door engines and circuit breakers, which are checked up and cleaned.

Little Rock Issues Time-table

WHILE the Little Rock, Ark., electric railway is primarily a street car system without long interurban connections, it has published a time-table of its various routes, grouping separately the weekday, Saturday and Sunday schedules, and giving as well the running times and time points. A sample of this time-table and reference to it are contained in the brief of the Arkansas Power & Light Company presented for the 1927 Coffin Prize. The schedule was issued on Feb. 15, 1927, and 25,000 were published. Distribution was made through operators and at cashier windows where street car tokens are sold.

Pictures of places of interest are shown in the booklet for the benefit of sightseers. They include the old State House, the new State Capitol, the Missouri Pacific station and the Memorial Bridge across the Arkansas River. The schedule has created much interest and has proved valuable to many patrons.

Unusual Acts to Improve Public Relations

DEVELOPMENT of ways for improving public relations and keeping in touch with public sentiment have been a feature of electric railway operation during the past decade. Various methods are now recognized as being of "the passenger be pleased" character. The brief of the El Paso Electric Company, El Paso, Tex., for the 1927 Coffin Prize shows that in addition to the standard ways it has developed a number of special methods of pleasing its patrons. A brief account of some of the more important of these follow:

The company's telephone operators are trained to answer inquiries intelligently and in a pleasing manner. Their training includes trips to all the company departments to acquaint them with those employees who use the telephones, how these departments function and the location of each branch phone. When a doubt exists as to the proper department to handle an incoming call, the operator determines this by a polite inquiry. When the right branch is not obtained at first, the employee who receives the call has it switched to the proper line.

If the company receives a complaint the investigation of which requires some time a special delivery letter is mailed acknowledging the receipt of the letter. This is later followed by a friendly visit to the individual making the complaint. Personal calls, in fact, are made in almost every instance regardless of the seriousness of the complaint, as this is found productive of the best results.

Last year on Christmas morning operators handed Christmas greeting cards to all passengers. The men took a genuine pleasure in doing this and awakened a similar feeling of good will toward them on the part of the public.

An inspection and information booth has been located in the heart of El Paso's downtown district. Last year the average number of inquiries made at it each day were about 400. Booklets are available here, as well as elsewhere, showing a map of the street car lines and bus lines, with the special feature that the house numbers in the different blocks are marked on all streets. This feature has attracted special popular favor because it supplies accurate information elsewhere not readily accessible.

Where a passenger drops too much money in the fare box, the operator is authorized immediately to refund the over-payment. Later he gets the money back from the division inspector.

Operators carry blanks called "Better Service Slips" on which they enter any comments they hear about the company and its service and forward them to the manager's office. Complimentary comments as well as those that are uncomplimentary are reported. They not only help the management to keep in touch with the opinions of the patrons but they are a powerful incentive to all employees to exert every effort to render the best possible service.

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Looking up the Avenue des Champs Elysées toward the Arc de Triomphe. This is one of the fine broad avenues in Paris. The raised platforms are for the benefit of pedestrians crossing the street

Paris Revises Street Railway and Bus Franchise

City makes changes in the method of calculating the bonuses for good management and economy of the local bus and street railway company

By Henry W. Blake
Senior Editor *Electric Railway Journal*

CHANGES have been made this year in the franchise under which the Société des Transports en Commun de la Région Parisienne operates the electric railway and bus lines in Paris. The authorities awarding the franchise were those of the Department of the Seine, in which Paris is located. The decree officially putting this franchise in force was issued on April 20, 1927. The changes from the previous franchise relate principally to the remuneration of the company for operating the system. The previous contract was dated Sept. 20, 1920, and was modified Feb. 7, 1925.

The theory on which the franchise, or leasing contract, is based is that the Department of the Seine is the owner of the property, having taken it over from the original proprietors, nine former operating companies. Their interest in it is being liquidated through annual payments by the department.

In the meantime the department has hired the S.T.C.R.P. to operate the property for a sum made up in part of interest on the investment which the S.T.C.R.P. has had to make and in part on a share in the earnings of the property. The company operates not only the bus and street railway lines in Paris and to some extent in the suburbs, but also a small steam suburban railway and a line of passenger boats on the Seine, engaged in local transit service. The steam railroad line and the boat line are not large portions of the company's business. It does not operate the rapid transit lines in Paris, those being

TABLE I—ANNUAL OPERATING REPORT OF S.T.C.R.P. FOR 1926 WITH RESULTS AFTER AMORTIZATION CHARGES

	Francs	Dollars
Passenger operating revenue (cars, buses and boats)	538,947,120	$21,557,885
Freight operating revenue	7,072,361	282,894
Miscellaneous operating revenue	5,905,008	236,200
Total operating revenue	551,924,491	$22,076,979
Operating expenses	552,245,542	22,089,821
Net revenue from operation (deficit)	321,052	$12,842
Fixed charges (including interest and amortization of purchase money and first cost)	81,854,031	3,274,161
Deficit of system	82,175,083	$3,287,003
Remuneration paid to company for operation	12,886,897	515,476
Deficit of department	95,061,980	$3,802,479

TABLE II—PROFIT AND LOSS STATEMENT FOR 1926 OF S.T.C.R.P.

	Francs
Balance from previous year	221,480
Interest at 6 per cent paid by department on capital stock	3,600,000
Operating bonus earned under contract	4,149,586
Economy bonus earned under contract	5,137,311
Miscellaneous receipts	251,397
Operating revenue	13,359,774
Corporate operating expenses and sinking fund payments of company	4,745,609
Gross income	8,614,165
Amount payable to department as its proportion of profits	1,376,390
Net income of company	7,237,775

Note: 1 franc taken as equal to 4 cents.

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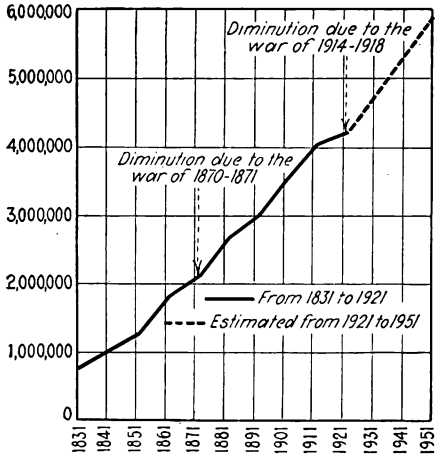

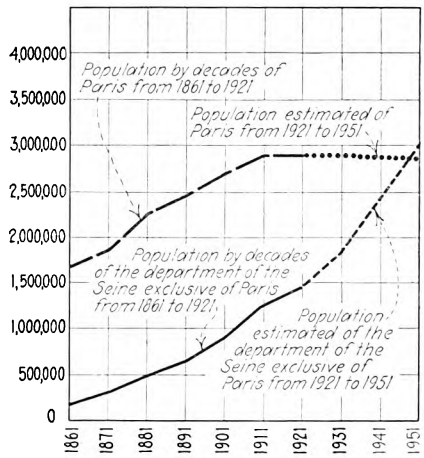

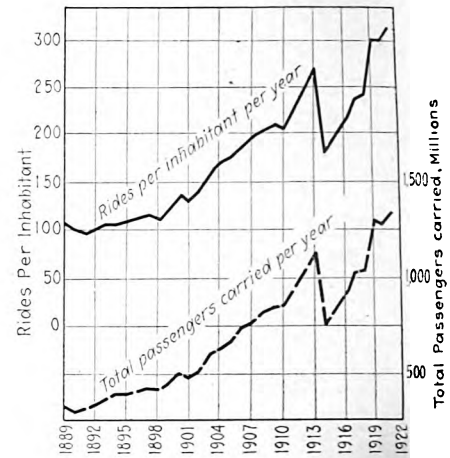

These charts show population and other data of Paris and the Seine Department

The chart at the left gives the population in the Department of the Seine by decades. The one in the middle gives the same figures since 1861, divided between Paris itself and the districts in the department outside the city limits. It will be noticed that during the decade 1911 to 1921 the population growth has been entirely outside the city and this condition is expected to continue. By 1951 it is expected more people will live outside rather than inside the city. The chart at the right gives total passengers carried and rides per inhabitant for the Department of the Seine by years since 1889.

operated by entirely different interests under a different group of franchises.

Under the contract which has just been superseded the remuneration of the company was made up of three elements, as follows:

1. Six per cent on the capital stock of the company, which is guaranteed by the department.

2. A so-called "good management" bonus, amounting to $\frac{3}{4}$ per cent of the gross receipts.

3. A so-called "economy" bonus, which has consisted of 4 per cent of the amount by which the receipts exceeded 65 per cent of the expenses. In other words, if the receipts should be represented by R and the expenses by D, this remuneration normally would be represented by the formula $0.04\ (R - 0.65D)$. This bonus, however, was subject to a decrease on a graduated scale if it should exceed 0.85 per cent of the receipts. Moreover, when the earnings of the company should be sufficient to permit of the distribution of a dividend exceeding 8 per cent half of the excess amount had to be paid to the department. If the dividends exceeded 10 per cent three-quarters of the excess had to be paid to the department.

The department was also entitled to certain other deductions from the receipts for payments to its reserves.

Under the new franchise the payment of interest at 6 per cent on the company's stock is retained, but a new clause takes the place of those relating to the former good management and economy bonuses. There is only one bonus and it is 0.9 per cent of the ratio of the receipts to the expenses, multiplied by the receipts. That is to say, it may be represented by the formula $P = 0.009\ (R \div D)\ R$, where R represents the total receipts and D the operating expenses including taxes, plus certain other charges mentioned in the franchise.

This method of calculating the bonus, it will be seen, embodies the principles of both of the former bonuses, i.e., it encourages an increase of receipts, the former "good management" bonus, and also a low operating ratio, the former "economy" bonus.

The franchise strictly defines what shall and shall not

TABLE III—STATISTICS OF S.T.C.R.P. FOR 1926

Kind of Service	Vehicle-Miles or Kilometers Kilometers	Vehicle-Miles or Kilometers Miles	Passengers Carried	Total Receipts Francs	Total Receipts Dollars	Receipts per Vehicle Francs per Km.	Receipts per Vehicle Cents per Mile
Tramways, electric	99,969,076	83,307,563	687,630,655	337,776,850	$13,511,074	3.379	21.626
Tramways, steam	1,888,393	1,180,246	1,734,055	3,357,753	13,431	1.778	11.379
Total tramways	101,857,469	63,660,918	689,364,710	341,134,603	$13,645,384	3.349	21.434
Motor buses, day service	53,712,345	33,570,215	332,116,486	194,337,564	7,773,503	3.618	23.155
Motor buses, night service	118,381	73,988	337,176	739,191	29,568	6.244	40.062
Total buses	53,830,726	33,644,204	332,453,662	195,076,755	$7,803,070	3.624	23.194
Boats on the Seine	282,488	176,555	2,879,833	2,619,885	104,795	6.850	43.840
Miscellaneous passenger receipts (supplementary fares, etc.)	.....	.....	.....	115,887	4,635	.....	.....
Freight and package service	.....	.....	.....	7,072,362	282,894	.....	.....
Grand total	156,070,683	97,844,177	1,024,698,205	546,019,482	$21,840,779	3.499	22.594

TABLE IV—STATISTICS, 1911 TO 1926, INCLUSIVE, OF TRAMWAYS AND BUSES IN PARIS

Year	Tramways: Car-Kilometers or Car-Miles Car-Kilometers	Tramways: Car-Kilometers or Car-Miles Car-Miles	Tramways: Passengers Carried	Tramways: Passenger Receipts in Francs	Omnibuses: Bus-Kilometers or Bus-Miles Bus-Kilometers	Omnibuses: Bus-Kilometers or Bus-Miles Bus-Miles	Omnibuses: Passengers Carried	Omnibuses: Passenger Receipts in Francs
1911	75,050,491	46,906,557	433,985,880	56,557,428	27,372,348	17,107,717	135,722,473	20,631,392
1912	76,997,481	48,123,426	450,604,011	59,213,692	33,669,598	21,043,499	205,945,280	27,516,097
1913	82,037,047	51,273,154	485,816,631	62,306,237	38,582,155	24,113,847	246,242,644	34,785,313
1914	70,243,643	43,902,277	438,952,347	55,897,862	23,356,028	14,597,517	151,919,20	21,344,558
1915	59,186,217	36,991,386	403,685,326	51,933,335	.....	.....	.....	.....
1916	65,756,437	41,097,773	481,996,737	61,796,411	779,172	468,982	8,315,300	1,209,344
1917	63,070,369	39,418,981	516,150,266	67,132,548	1,738,703	1,086,689	19,862,443	2,892,609
1918	59,919,609	37,449,756	522,667,881	68,766,124	3,016,092	1,885,057	31,601,709	4,711,248
1919	71,271,056	44,544,410	598,109,481	107,209,028	10,963,320	6,852,075	95,420,364	19,155,420
1920	79,598,092	49,748,807	605,778,933	161,243,333	22,072,911	13,795,569	165,984,957	50,787,283
1921	90,526,381	56,578,988	636,365,516	186,849,412	35,219,814	22,012,384	245,874,430	82,575,818
1922	93,202,943	58,251,839	635,592,912	193,534,666	43,210,149	27,006,343	290,146,147	104,246,917
1923	99,375,804	62,109,877	694,827,609	208,932,188	50,270,827	31,419,267	337,503,838	121,812,738
1924	99,816,172	62,385,107	723,153,749	237,485,002	54,218,608	33,886,630	356,529,851	143,776,368
1925	102,790,625	64,244,141	720,279,679	271,295,119	53,501,626	33,438,516	344,800,583	157,056,980
1926	101,857,469	63,660,917	689,364,710	341,134,602	53,830,726	33,644,204	332,453,662	195,076,755

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be considered operating expenses, and certain administration expenses, as well as certain corporate expenses not connected with operation, are not to be included.

Certain other payments, including those necessary to amortize within 30 years the company's capital stock of 60,000,000 fr., are made out of a separate allowance received from the department.

The bonus so earned is subject to deductions should it amount to 5,000,000 fr. a year. These deductions might be considered as a form of profit sharing with the department. The amount thus to be paid to the department is as follows: Twenty per cent of the bonus if it amounts in any one year to between 5,000,000 fr. and 8,000,000 fr.; 30 per cent if it is between 8,000,000 fr. and 10,000,000, and 40 per cent if it is more than 10,000,000 fr.

The bonus is also subject to a discount in any year in which there is a deficit from operation. This deduction is to be a percentage of the bonus already mentioned, $0.009\ R^2 \div D$, the percentage being calculated according to the formula $0.5\ (D - R) \div R$, in which D, as before, represents expenses and R represents receipts, D being greater than R, as this formula applies only when there is a deficit from operation. But this deduction from the bonus has a limit as it cannot be more than 20 per cent of the bonus otherwise earned. In other words, when there is a deficit, the bonus becomes $P^1 = P\ [1 - 0.5\ (D - R) \div R]$ except that P^1 can never be less than $0.80\ P$.

This provision does not affect in any way the deductions already mentioned where the bonus, however calculated, amounts to 5,000,000 fr. a year or more.

There are other changes to clauses in the contract, but it is believed that those mentioned are of the most general interest.

The employees continue to receive a bonus of 4 per cent of the gross receipts in addition to their wages, as formerly, but as this bonus is included in operating expenses, it does not affect the remuneration of the company.

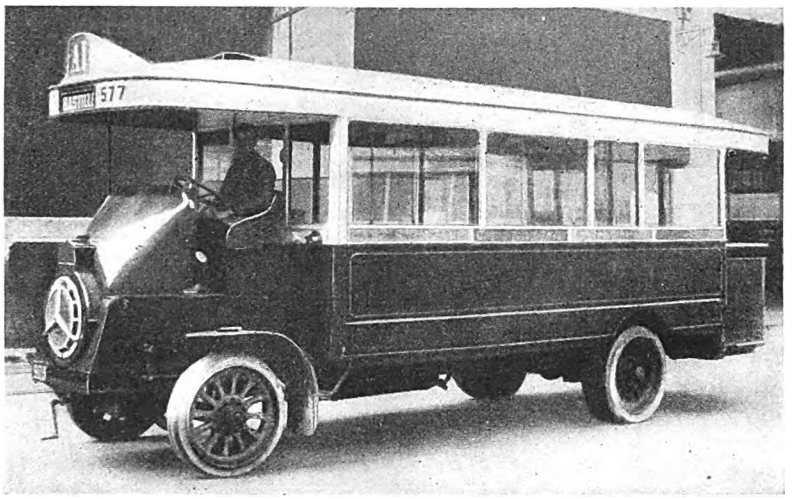
The operating report of the company for the calendar year of 1926 is shown in Table I. Compared with the 1925 figures, those for 1926 show an increase in total operating revenue of 110,002,240 fr., an increase in operating expenses of 82,024,968 fr., a reduction in the deficit from operation of 27,977,272 fr. and a reduction in the final deficit to the department of 35,439,289 fr. Part of this better showing was undoubtedly due to an increase in fare of about 25 per cent which went into effect in August, 1926.

The profit and loss statement of the company is given in Table II.

From this sum of 7,237,753 fr. for surplus for the year, after payment to reserves, directors' fees and the interest at 6 per cent mentioned above, a dividend of 4 per cent was declared on the capital stock. This dividend (with the 6 per cent interest already mentioned) made 10 per cent paid on the capital stock.

Some general statistics of the company's service are given in Tables III to V. In Table IV the low figure for the buses during 1917, 1918 and 1919 are due to the building up of the bus service during these years following its disorganization during the war. During 1911, 1912 and 1913 the bus receipts were from 37 to 50 per cent of the tramway receipts. On Aug. 2, 1914, all the Paris buses were requisitioned for military purposes and operation ceased. It was not until June 1, 1916, that the bus service began to be resumed and it was not until 1925 that full service recommenced.

The financial figures in these tables as well as the records on fare increases will hardly be understood unless the reader realizes the great increase in prices, measured in francs, which has taken place since 1914. Part of this, of course, is due to a fall in the exchange value of the franc, which in United States money was worth about 19¼ cents in 1914, but now has an exchange value of about 3.95 cents. It has been taken as 4 cents in all the accompanying tables. Table VI gives the various price index figures in France for general supplies and for the



Three steps in the evolution of the present Paris bus. Note the single rear exit and entrance in all of them and even in the horse car on page 1188

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wages paid and other operating expenses as well as the fares of the Paris company.

Incidentally, it might be said that in 1926 labor accounted for 64.4 per cent of all the total operating expenses of the company, electrical energy for 7 per cent and fuel for the buses for 7.3 per cent.

For fuel the Paris buses now are using a mixture consisting of one-third gasoline, one-third alcohol and one-third petrol or kerosene. This mixture is used partly because of the high cost in France of gasoline and partly because, as alcohol is a French product, a tariff reduction is permitted on the other ingredients employed. At first the company had difficulty in keeping these three parts thoroughly mixed because of the difference in their specific gravities. This was finally overcome and the mixture now makes an acceptable fuel.

The charts on page 1186 giving population trends and data since 1831 as well as passengers carried and rides per inhabitant in the Department of the Seine since 1889 are from an analysis of traffic conditions in Paris, made in 1926 by A. Mariage, chairman of the board of the S.T.C.R.P.

In that study Mr. Mariage pointed out that the demand for transportation in Paris in recent years had grown much more rapidly than the transportation facilities. He urged the especial need of means for satisfactorily serving the suburbs, which are increasing in population rapidly, while the population in the center of the city is about stationary.

His recommendations include preparation by the city of a comprehensive city development and transportation plan under which part of the cost of financing the necessary transportation facilities would be borne by the territories directly benefited. The transportation system, in his opinion, should include rapid transit radial service and means for local distribution, all under one management.

Physical Equipment and History of Present Company

On Dec. 31, 1926, the rolling stock of the S.T.C.R.P., the company which operates all of the buses and street railways in Paris, consisted of the following:

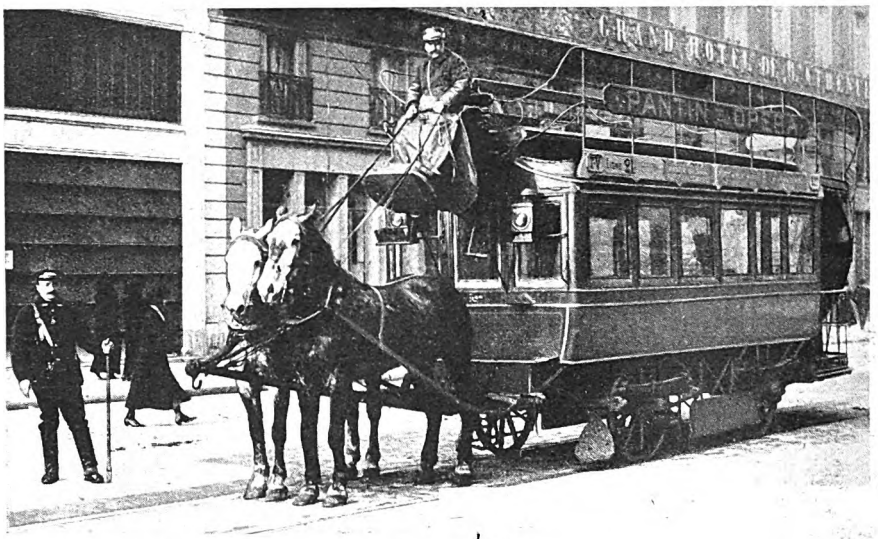
Electric tramways—2,291 motor cars, 892 trail cars.

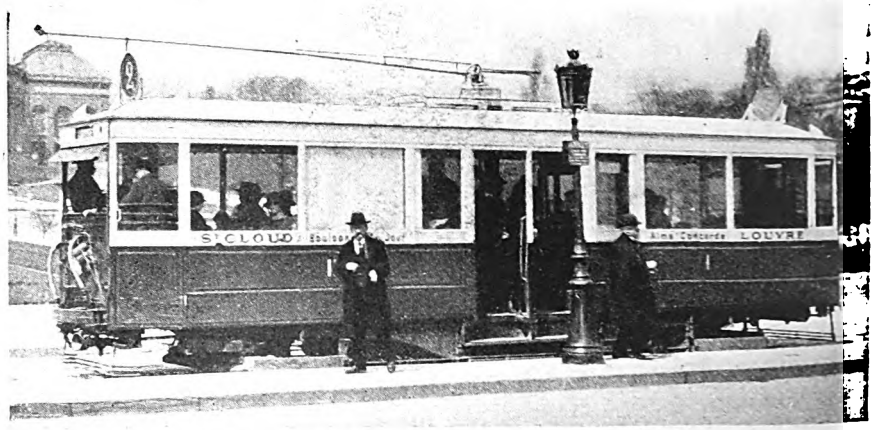
One suburban steam tramway—Nineteen locomotives, 75 passenger cars, 134 freight or baggage cars, two gasoline rail cars.

Motor buses—1,268 four-wheel buses, including one trackless trolley; 51 six-wheel motor buses, 30 express type buses, 22 auto cars.

Boats—56 passenger steamers, two tugs, 68 tow boats.

The present company is the successor in handling street railway and bus traffic of nine older companies, namely: Compagnie Générale des Omnibus de Paris, Compagnie des Tramways des Paris et du Département de la Seine, Compagnie Générale Parisienne de Tramways, Compagnie des Tramways de l'Est Parisien, Compagnie des Chemins de fer Nogentais, Compagnie Electrique des Tramways de la Rive gauche de Paris, Compagnie du Chemin de fer du Bois de Boulogne, Compagnie du Chemins de fer sur route de Paris à Arpajon, Compagnie des tramways de l'Oust Parisien. Of these the first named, the Compagnie Générale des Omnibus, was the pioneer.





The horse car of 30 years ago and the modern electric car. Upper decks for passengers have been abandoned in Paris for both cars and buses

Omnibus Transportation in Paris Since 1828

According to the records, the first regular omnibus company organized to give local transportation in Paris was chartered in 1828. The rate of fare at first was 25 centimes, raised later to 30 centimes, and a number of omnibuses were put in service. At first they were rather scorned by the bourgeoisie, but they soon gained popularity. By 1854 and 1855 there were no less than twelve companies operating street lines and employing 3,925 horses. Various models of buses were used. The names of some of these early companies, translated into English, were General Omnibus Company, the Favorite, the Citizens, the Gazelle, the Parisian, the Classical and the Excellent.

In 1855 all of these companies were consolidated, under the name of Compagnie Générale des Omnibus (General Omnibus Company). This company received from the municipality a 50-year franchise for the exclusive right in Paris of transporting passengers and occupying the public streets for vehicles engaged in such service. Later, the life of its franchise was extended.

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TABLE V—FARES IN PARIS, TRAMWAYS AND BUSES, 1919 TO DATE
(Fares given in centimes. 100 centimes = 1 franc

	Second Class		First Class	
	One Section	Two or More Sections	One Section	Two or More Sections
Prior to Feb. 8, 1919	10	15	15	20 (*t*) / 25 (*b*)
Feb. 8, 1919, to April 1, 1920	15	20	20	30
April 1, 1920, to Jan. 19, 1922	25	35	35	50
Jan. 19, 1922, to Jan. 15, 1924	25	40*	40	55*
Jan. 15, 1924, to Aug. 1, 1925	30	45	45	60
Aug. 1, 1925, to Aug. 1, 1926	40	60†	60	80†
Aug. 1, 1926, to date	50	75‡	75	100‡

Note.—Fares in centimes; 100 centimes equals 4 cents.
(*t*) = Tramways only.
(*b*) = Buses only.
* For two sections only. For more than two, an additional charge of 15 centimes first class and 10 centimes second class, per section.
† For two sections only. For more than two, 1 fr. first class and 0.80 second class.
‡ For two sections only. For more than two, 1.25 fr. first class and 1 fr. second class.

TABLE VI—PRICE INDEX INCREASES COMPARISON, 1914 PRIOR TO THE WAR WITH DECEMBER, 1926
(Based on 100 in 1914)

Industrial Index Figures:	
Manufactured supplies	802.0
Minerals and metals	820.0
Coal	635.0
Electrical energy	454.0
Labor:	
Wages paid by the S.T.C.R.P.	700.7
Expenses and Fares of S.T.C.R.P.:	
Bus operating expenses	453.0
Electric railway operating expenses	528.0
Total operating expenses	500.0
Fares	450.0

Note.—All prices are computed in French francs.

Some of the early types of omnibuses used in Paris are illustrated. While they differ greatly from the present buses in design, as well as in motive power, some of the features of the early buses have been retained in those which operate over the Paris streets of today. Noticeable among these features is the single entrance and exit in the rear of the bus. The Paris management believes this place for entrance and exit is safer than at the side. Its latest electric railway cars, however, have a center entrance only.

Tramway Development

Although some tramway track was built in Paris in the '60s, street railway construction on a large scale was not begun until after the war of 1870, when several lines were built by the General Omnibus Company. Later, with the assent of this company, other companies built short sections of tramways.

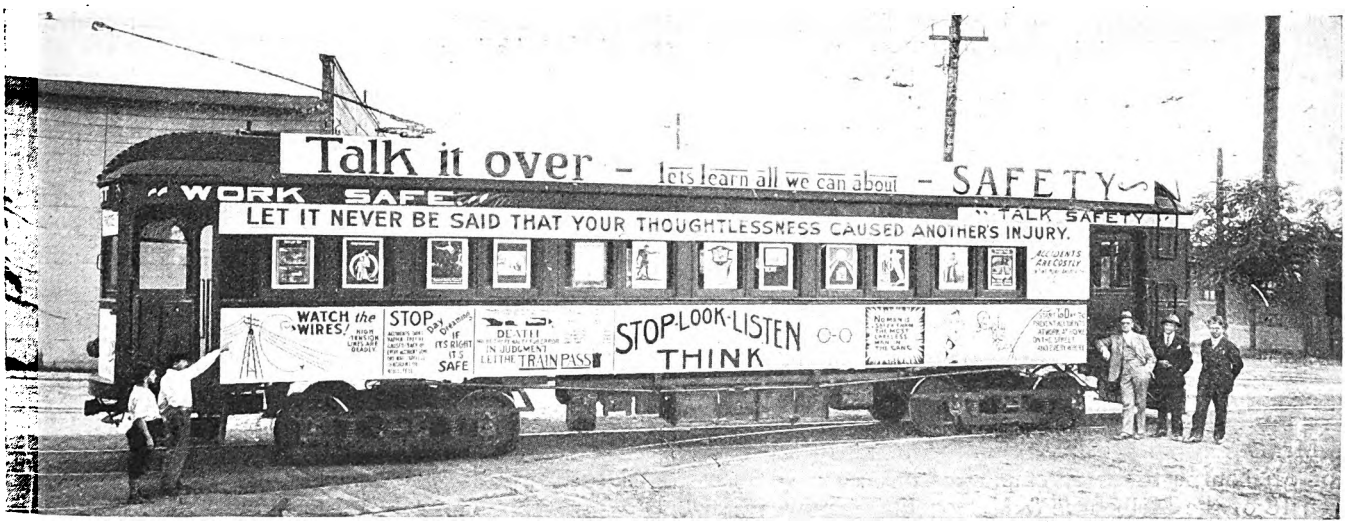
As will be seen from Table IV, the street railways carry about twice the number of passengers and operate about twice as many car-miles as the omnibuses. Several street railway lines have stub terminals close to the center of the business district, as at the Madelaine, Opera, Louvre and Place de la Concorde, but in the district within these points, and bounded on the northeast by the Boulevard de Sebastopol, there are no street railway lines. This restricted area is about 1 mile long and from ¾ to 1 mile wide. There is no definite policy on the part of the city authorities to expand this area of purely bus operation, though in the last few years the company has removed about 2 miles of electric railway track north of the Seine and 2 miles south of the Seine in very dense traffic sections at the request of the police department.

The street railways in the center of the city use the underground conduit and outside of the center the trolley. The underground conduit originally built in Paris was constructed under one rail, so that the slot for the conduit served also as the groove for the rail. This system had various drawbacks, especially as to switches, and all recent conduit construction has been of the center slot type.

Safety Car Brings Vital Message to Interstate Public Service Patrons

SAFETY has been made a big factor in the successful operation of the Interstate Public Service Company, Indianapolis, Ind. James Harmon, safety manager, recently chose the most dangerous time of the year to impress the company's patrons that they must be on their guard against accident. This was at the opening of the school year, when the "Safety Car" pictured left Indianapolis to visit most of the cities and towns along the line between Indianapolis and Louisville. The interior of the car was placarded with safety bulletins and shop bulletins. There was also a display of safe and unsafe articles and appliances. Safety pamphlets were distributed to the public and the prone-pressure method of resuscitation was demonstrated. Safety talks were also made before several groups.

School children received a special invitation to view the car and it is estimated that more than 5,000 men, women and children inspected it.



This car was sponsored by the Interstate Public Service Company, Indianapolis, Ind. It told its story from the capital of Indiana to Louisville, Ky.

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Australian Pension Plans Discussed

Melbourne study shows that pensions cannot be paid out of fares alone. Deferring payments is a dangerous expedient

SOME striking facts regarding the cost of a superannuation fund for tramway employees similar to those already enacted for other Victorian employees or in force in other Australian states were given in connection with evidence to be presented to the state parliamentary accounts committee by W. O. Strangward, secretary Melbourne and Metropolitan Tramways Board during 1927. An abstract of his notes follows:

The New South Wales superannuation act of 1916 calls for the compulsory participation of railway and tramway employees in funds covering the retirement of men at 60 years and of women at 55 to 60 years. The pensions range from £52 ($253) to £312 ($1,516) a year.

The employee's contribution to a pension of £2 ($9.72) a week for himself and less for his widow and children ranges from 2s. 4d. (58 cents) for male employees aged 16 to about 5½ times that amount for male employees aged 60. Contributions and benefits in the case of women are considerably lower.

The act provided that in respect to future employees the state would pay as much as the employee. However, the then employees were to pay no more than the "age of 30" rate. This was to be matched by the state plus the shortage between the "age of 30" rate and the employee's actual age for pensions up to £104 ($505). So far, the New South Wales government had fallen short of its share by £2,000,000 to £3,000,000 and was planning operations whereby these arrears could be refunded over a long period of years.

The Victorian superannuation act of 1925 is similar to that of New South Wales, but the retirement ages are five years greater, which substantially reduces the cost. To get £2 ($9.72) a week for himself or less for his family, an employee pays from 2s. 1½d. (about 52 cents) a week at the minimum age of 16 up to about twenty times that amount if aged 65. Another important difference is that the state's contribution is not made to match the employee's weekly payments but is given in the form of an amount ranging from 50 to 98 per cent of the pension when it becomes payable, so that the main burden is pushed off to later years. The commonwealth superannuation act of 1922-24 is similar to the Victorian except that the maximum pension is £416 ($2,022) instead of £312 ($1,516).

Mr. Strangward pointed out the ethical injustice of the Commonwealth and Victorian plans, because pensions are really deferred wages which should not be saddled upon the next generation. In Victoria, however, the extenuating circumstances are stronger for certain historical reasons in connection with earlier pension funds.

What Pensions Would Mean to Melbourne Tramway Finance

Mr. Strangward then took up the matter of a pension for Melbourne tramway employees in accord with section 18 of the Melbourne & Metropolitan Tramways act of 1918. He felt that the board was not likely to approve any scheme based upon a postponement of present actuarial liabilities. The revenue of the governments was raised by taxation, but that of the tramways came out of fares. A further increase in fares would cause many passengers to find other means of transport, and in all probability, higher fares would not produce more revenue. Apparently, this left the imposition of a special tax on the community at large as the way to provide a superannuation fund. For this reason, the board would probably incline to the view that it must provide for all accruing liabilities out of each current year's revenue.

Pending actuarial study, and excluding about 1,000 temporary employees, Mr. Strangward submitted the following table:

	Number	Average Age	Weekly Payment*	Average Earnings*
Staff	720	40	8s. 5d. —$2.10	£312—$1,516
Traffic	3,500	36	5s. 6½d. — 1.37	255— 1,239
Shops	820	38	6s. 1½d. — 1.52	260— 1,264
Construction	100	38	6s. 1½d. — 1.52	245— 1,191
	5,140			

* At $4.86 to the pound sterling.

Based upon the principles of the Victorian act of 1925 with 65-year retirement age, the employees would contribute £80,837 and the board an equal amount, giving a total of £161,674. However, if employees in the £104 a year pension maximum class paid at the "age of 30" rate and the staff or office employees in the £130 a year class paid at the "age of 40" rate, the weekly contributions would be only 5s. 10d. (approximately $1.45) for office employees and 4s. 2½d. (approximately $1.05) for the others. This would cut the employee's share to £59,282 and raise the board's contribution to £102,392.

If the 60-year age of New South Wales were used, the employee's half in the first calculation would be £221,468 a year; and in the second or fixed-age contribution scheme, £77,235, with £144,233 a year to come from the board. The cost of the scheme would be slightly reduced through lower costs and obligations for women but would be higher than estimated, since many employees would be under 30 years of age.

Existing Scheme of Retirement Allowances

In 1923, the board made this provision: An employee of at least ten years' service who retires at the age of 60 years, or the widow or children under 16 years of age of an employee of such service who dies after reaching 55 years, receives a lump-sum gratuity from the board based upon two weeks wages for each year of service since July 1, 1910, with a maximum equivalent to 39 weeks' salary or wages. This is a voluntary allowance, and employees do not contribute to its cost. It averages about £5,000 per annum.

Mr. Strangward also called attention to the commonwealth invalid and old age pension acts which grant a pension of £1 ($4.86) a week to employees who have reached the age of 60 if permanently incapacitated or else those who have reached 65. The employee makes no direct contribution to this fund. Accident and illness cases are also under this fund. Receipt of a tramway pension of £104 a year would debar unmarried persons from the £52 a year of the commonwealth pension. However, if a husband and wife are each entitled to claim old-age pensions, the receipt of the £104 tramway pension (if such be their sole income) would operate to reduce their old-age pensions to 12s. 6d. (about $3.10) a week each. This means that tramway employees who may become qualified to obtain the commonwealth pension would in many cases obtain no increase in their total incomes because they had participated in the suggested tramway superannuation fund.

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Illinois Central Has Steadily Improved Its Suburban Service*

By W. M. Vandersluis
Electrical Engineer Illinois Central Railroad, Chicago, Ill.

EXACTLY 70 years after the first steam suburban service was started in Chicago by the Illinois Central Railroad three electric trains were operated each way in the local service between Randolph Street and Hyde Park. Beginning with the second week 80 trains were operated each day and in the period of about five weeks the electric service was built up to more than 350 trains. These were all operated, of course, on the existing steam time-table, as there was still a considerable number of steam trains in the service.

The first electric time-table was put in effect on Aug. 28, with a total of 396 revenue trains. On account of a shortage of new equipment it was still necessary to run six trains by steam, but these were confined, so far as possible, to those carrying shop employees.

Today 470 revenue trains are being operated on a normal weekday. In addition there are fourteen equipment trains and 72 Chicago, South Shore & South Bend trains, the latter being operated between Kensington and Randolph Street. This is a total of 556 electric trains. Electric service was put in effect with no serious accidents or interruptions and has continued so during the first year. Because all of the motor-trailer car units are uniform in design and in operating characteristics, the preparation of time-tables and the handling of equipment at terminal points has been greatly simplified.

Fig. 1 shows by months the revenue passengers carried, the car-miles and hundreds of seat-miles operated and the weekday trains in service.

Improved Service With Electric Operation Due to Higher Speed and Reliability

Of particular interest is the improvement in running times due to electric operation. The latest electric time-table shows decreases in running times over the old steam service of from 11 to 28 per cent for the various classes of trains, the larger percentages resulting for trains to Kensington and beyond. The decrease in over-all time results from high maximum speeds and by the use of high accelerating and braking rates. Acceleration is at the rate of 1½ m.p.h.p.s., which is about six times as rapid as that of through passenger steam trains. Under normal operation a train will reach a speed of 28 m.p.h. in twenty seconds. After that point the rate of acceleration falls off,, but on level tangent track a train will reach a speed of 50 m.p.h. in two minutes. With present average voltage conditions, balancing speed is about 64 m.p.h. Comparatively high braking rates have been effected on the steam trains, but these also have been increased on the electric trains, which brake at the rate of 1¾ m.p.h.p.s. It is significant that large

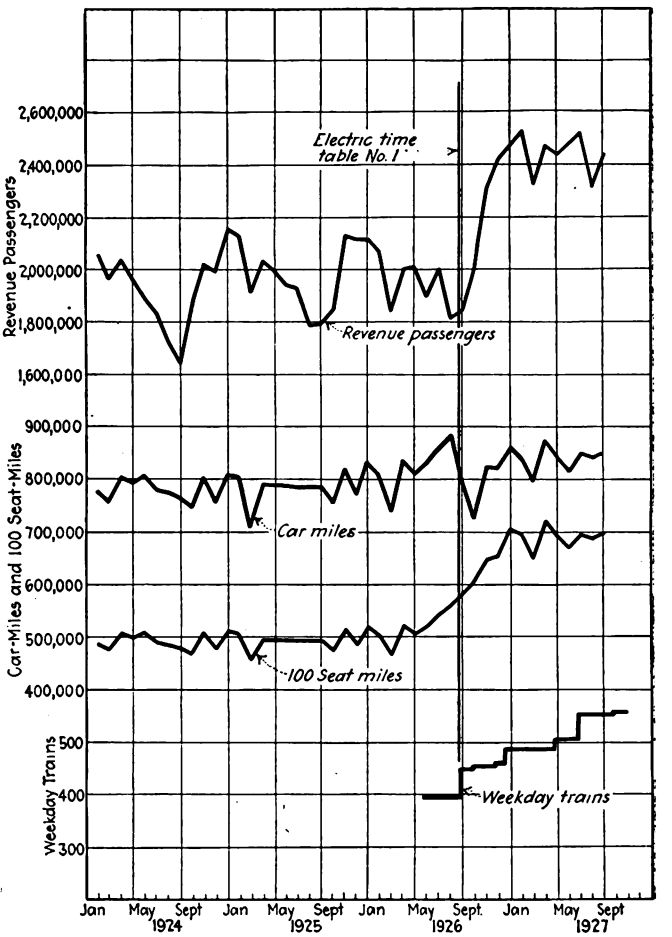

Fig. 1—Operating curves before and after starting electric operation on Illinois Central Railroad

decreases have been made in running times even on runs where more stops are made than formerly.

There has been a large gain in the use of electricity as compared with steam from the standpoint of operating a congested terminal. This improvement will become of greater importance as the service grows, inasmuch as with steam the limit to the number of trains physically possible to move in or out of the Randolph Street terminal was rapidly being approached. It is readily apparent that this gain is made by the elimination of movements necessary for steam engines in changing ends of trains, and also in being brought from and taken to the engine terminal, since these movements must be made over the tracks serving useful train movements. The electric train requires only the normal loaded movements over these busy sections, except when brought from or taken to storage tracks at the beginning or end of rush hours.

**Abstract of a paper presented at the regional meeting of the Great Lakes Section, A.I.E.E., Chicago, Ill., Nov. 28-30, 1927.*

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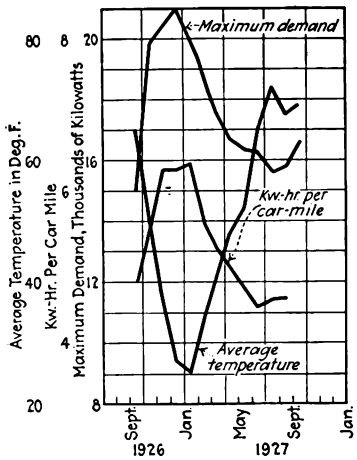

Fig. 2—Curves showing monthly averages of temperature and kilowatt-hours per car-mile and monthly maximum demand

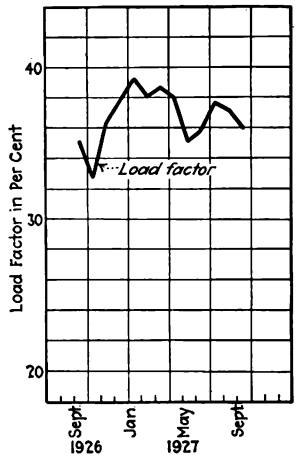

Fig. 3—The load factor curve shows a considerable variation over the twelve-month period

The speed and reliability of electric service have been further enhanced by other improvements of the entire terminal. These include changes in the grades, rearrangement of tracks, elimination of railroad grade crossings, installation of high platforms at all suburban stations, additional interlocking plants and rebuilding the entire automatic block system to conform to electric traction requirements, a great part of which had been completed at the time of beginning electric operation.

Results obtained from the motor-trailer combination have been satisfactory to the operating officers. The elimination of all steps on the cars for regular operation and constructing high platforms, the use of sliding doors, fully inclosed vestibules, tight lock couplers, automatic acceleration and electro-pneumatic braking have made the service safer, speedier and more convenient.

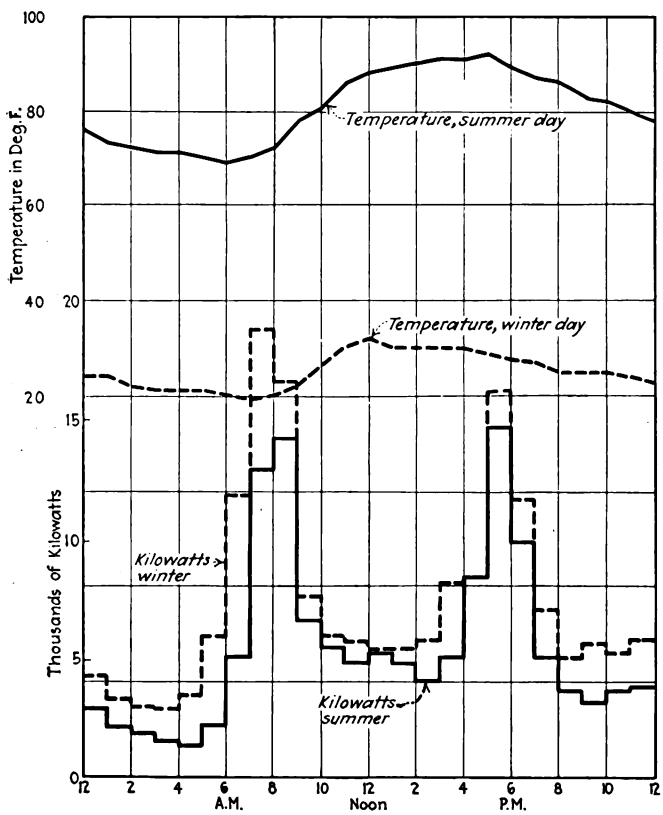

Fig. 4—Typical summer and winter weekday load curves and temperatures. Full lines are for the summer day, the dashed lines for the winter day

The employment of aluminum or aluminum alloys in side and roof sheets, doors, conduit and fittings has materially reduced the weight of the cars and, thereby, the operating expense. The weight of the motor car is 70.65 tons and the trailer 44.27 tons, an average weight per car of 57.46 tons. For the year ended Sept. 1, 1927, the average cost of maintaining the cars was about 6 cents per car-mile. Delays due to electrical equipment have been very few and no radical changes in design have been found necessary. Minor changes incident to new designs have been made, but at very slight expense.

Operating Figures Vary Considerably

Fig. 2 shows the kilowatt-hours per car-mile and the maximum demand in kilowatts, with corresponding average temperatures. Electric heating of cars is, of course, largely responsible for the variation between the different months, but changes in time-table also affect it slightly.

For the year ended Sept. 1, 1927, the total energy supplied under the contract with the Commonwealth Edison Company was 57,274,512 kw.-hr. Of this total, 92.7 per cent was for traction purposes, including heating of cars; 6.1 per cent for light and power and 1.2 per cent for signals. The contract also provided that the railroad company guarantee a 30 per cent load factor. It will be noted in Fig. 3, showing the variation in the load factor, that it is well above the guarantee. Load curves for typical summer and winter weekdays are shown in Fig. 4.

The supply of energy by the power company in specified feeders to the right-of-way line of the railroad company from the seven substations has been looked upon in some quarters with misgiving. This requires that not only the conversion machinery but all protective apparatus in the railroad company's feeders be maintained by the power company. The railroad company, however, has taken over, under normal operation, the control of all traction feeders by use of its supervisory control system. So far the results obtained have been satisfactory with the power company's broad-minded policy in operating under the necessarily somewhat complicated agreement.

Breakers Have Functioned Well

Discrimination of the high-speed circuit breakers has been excellent. The overhead network on a multiple track railroad such as this installation covers is complex due to the necessity of having a minimum amount of track out of service, in case of a fault. Isolation of individual sections in case of trouble has come up to expectations with very good protection to line and equipment. Furthermore, the power supervisor controlling the traction feeders has immediate information as to opening of breakers. He is located in the office of the train dispatcher, so that, by working close together, trouble from a train going from a live to a grounded dead section has been minimized. The use of wayside signals indicating a dead trolley section at points where the sectioning is outside the limits of interlocking plants has also saved burn-outs of overhead.

The cold weather of the first winter indicated that a few minor changes, especially in pull-offs, were desirable. The delays which have occurred, however, have been small considering the size of the installation and the number of trains operated.

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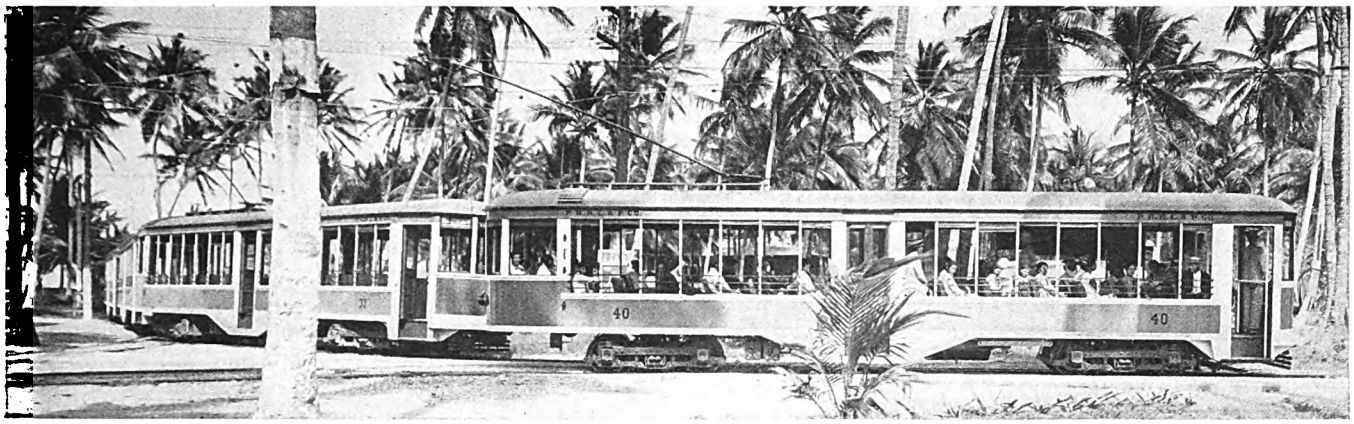

The new cars are comfortable and attractive. They replaced antiquated equipment that repelled riders

Revenue Doubled

by Modernization of Porto Rico Railway

New cars have been bought, some old cars have been remodeled and track has been rebuilt. Polarity of electric distribution has been reversed

By Frederick Krug
General Manager Porto Rico Railway, Light & Power Company, San Juan, P. R.

IMMEDIATE increase of 30 per cent in the number of passengers carried and the doubling of its passenger revenue in a period of one year have been the result of improvements introduced on the street railway system of the Porto Rico Railway, Light & Power Company, San Juan, P. R. Four factors have contributed to the attainment of this result: First, the purchase of six new steel cars, modern in every respect and specially designed for tropical service, and the complete rehabilitation of the best five of 35 old cars; second, extensive overhauling and improvements to track and roadbed; third, speedier and more reliable service by the substitution of a loop operation for the former single-track service with turnouts and delays in the residential district, and, fourth, advertising and publicity.

Staggering along some years ago with antiquated equipment, with maintenance deferred on its track and with practically unlimited competition by jitneys and

The city of San Juan is on the island in the foreground. On the mainland behind are two important suburbs

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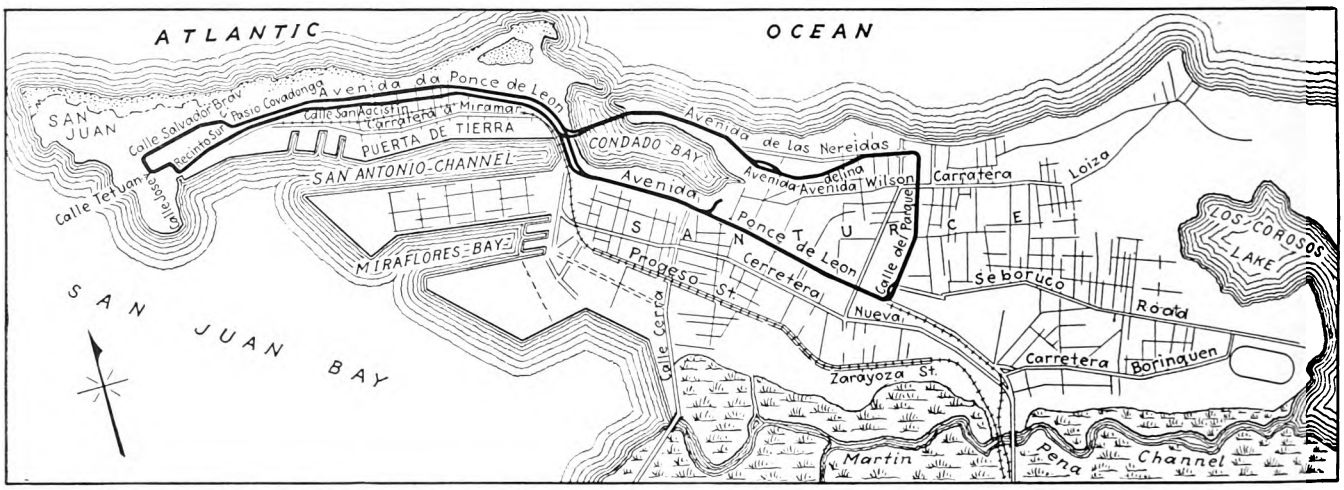
buses, the situation of the trolley system went from bad to worse, until finally, early in 1926, the losses reached such a magnitude that some drastic action was necessary. The company had been trying for more than seven years to secure a franchise to extend its double track from the city of San Juan through the main residential district of Santurce, but without success. It was impossible to give an adequate service in a city of the size of San Juan with a single-track system. Abandonment was considered as a means of bringing the matter to a head, but this proposal was not acceptable to the Public Service Commission except under conditions with which the company was unwilling to comply. The population of San Juan and environs is approaching 100,000 and the city is growing rapidly. It was felt that no city of this size could be adequately served by buses alone and that the street car would sooner or later come into its own again as a vital factor in the transportation situation.

Accordingly plans were made to rehabilitate the system



Double track is used in San Juan. In the suburbs at the right is a single-track loop, on which the direction of traffic is reversed several times a day

in an endeavor to meet operating expenses pending the possible construction of a double-track system later and the growth of the city to the point where the street railway again became indispensable. An order was placed for six new light-weight, steel, four-motor, single-end cars, with a seating capacity of 57 and a total weight of only 30,000 lb. These six cars were placed in service last spring and have been running for eighteen hours a day since their arrival. With their bright and cheerful coloring of yellow and white, contrasted to the barn red on the old cars, the new cars met with instant public favor. The leather-upholstered seats in place of wooden seats on the old cars, their practically noiseless operation and the cheerful interiors all contributed to their immediate success. An innovation for Porto Rico on these cars is the front-entrance and center-exit arrangement. The conductor is stationed at the center doors and fares are collected on the pay-as-you-pass system. This has increased the seating capacity and made feasible observation seats on the rear of the car. These seats have proved to be very popular.

Five of the best of the old cars were completely remodeled and painted to conform to the color scheme on the new cars. Leather-upholstered seats were installed and the trucks and bodies were revamped to secure quiet operation. These cars have been helpful in securing the increase in patronage, but it is felt that it would be inadvisable to overhaul any more of them. It is planned rather to buy new ones as the increase in riding requires.

The work of reconstructing the track and roadbed was started a year ago and has not yet been completed. This has involved considerably more expense than was originally anticipated. Nevertheless the work has been carried out in a thorough manner because the company has confidence in the future of the street railway. Fortunately, a considerable portion of the track is T-rail, open on a private right-of-way and paved only at street crossings. Work on this track was completed rapidly. Defective sections of rail were replaced with new rail and all poor ties replaced with hardwood ties purchased in Santo Domingo and in the local market. Badly cupped rail ends were cut off and joints made smooth by building up low spots with the electric welder. A considerable amount of ballast was also added, which has helped to promote smooth riding.

Track in the old city of San Juan is paved. This section is at considerable distance from the power house and it was found that, due to the poor track bonding with which the system had been operating for many years, the bases of most of the girder rails had been eaten away by electrolytic action. This has necessitated tearing up much pavement for replacement of rails and considerable expense has been entailed thereby.

In order to put a stop to this corrosion of the rail on the most expensive part of the roadbed, in addition to improving the bonding, it was thought advisable to reverse the polarity on the system, thus reversing the current flow at the rails. Furthermore, grounds were installed at four points on the system from the rail to the salt water which completely surrounds the city. A good ground consisting of several large steel boiler shells was installed at the power house. It is believed that the reversal of the polarity (negative on trolley, positive on rail), combined with salt water grounds and improvements in the bonding, will keep down rail corrosion and result in a considerable saving in power and better voltage at the motors with a resultant saving in motor maintenance.

The most difficult problem of all was to find a substitute for the single-track service that had been given in the suburbs of Santurce and the Condado for years. San Juan stands on an island almost 3 miles long. The suburbs of Santurce and the Condado, on the mainland,

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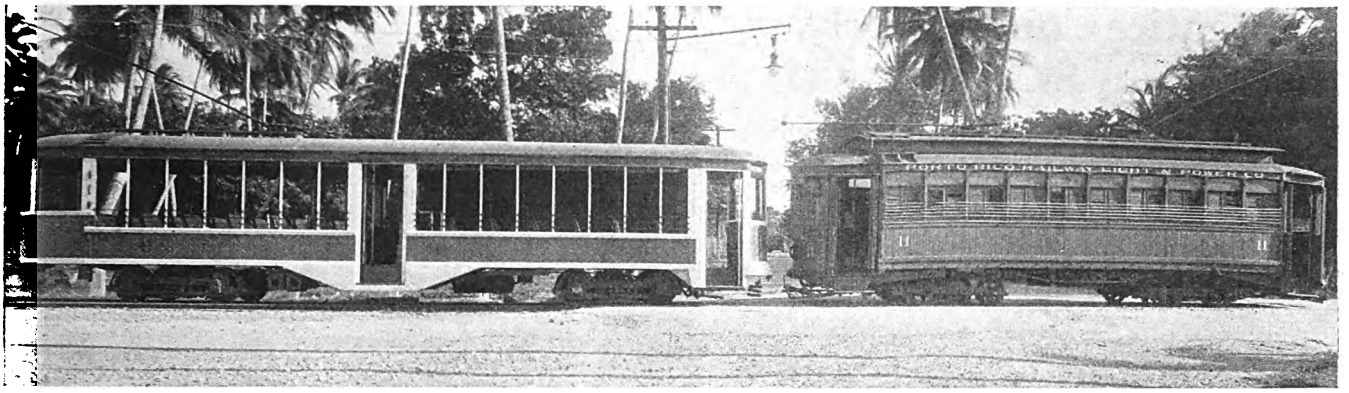


Comparison of the new and the old. The change has enabled the revenue to be doubled

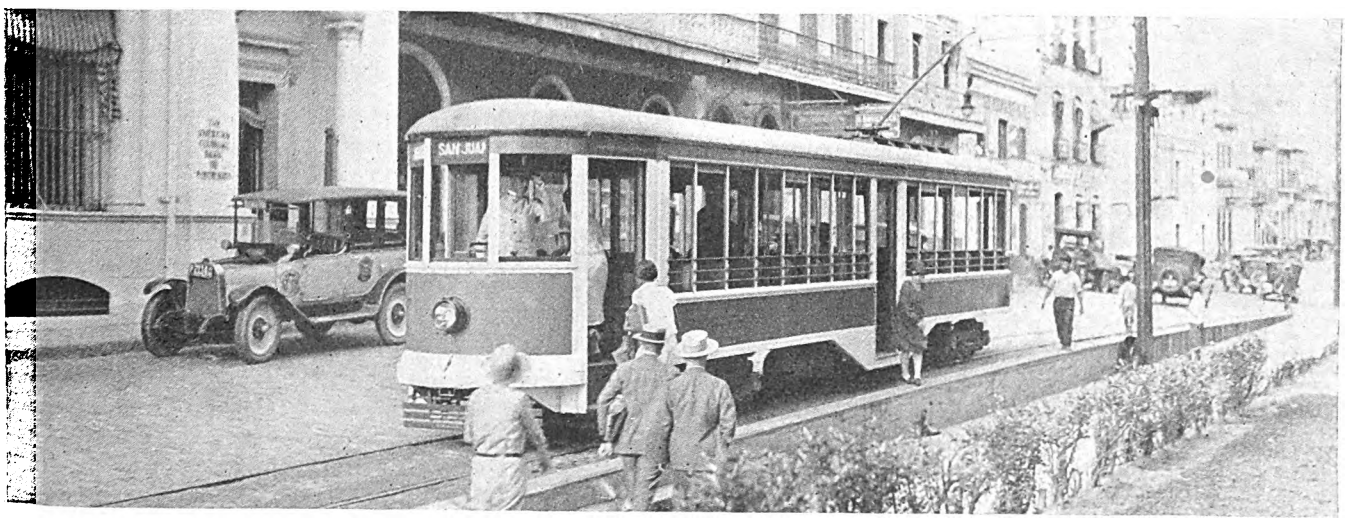
are reached by several bridges, but are divided from each other by a bay of some extent. In the city of San Juan the system is double track, but at the bridges one track goes out through Santurce on the main highway and the other through the Condado, the two joining to form a loop about 2 miles further out. This situation is shown on an accompanying map.

The Condado section is thinly populated, mostly by people of large means who use private automobiles almost entirely. Santurce, on the other hand, is densely peopled with potential street car riders who at the time these improvements were inaugurated used the buses almost exclusively. The idea was conceived of giving a loop service in the suburban territory by running the cars in the direction demanded by the majority. This was found to require five reversals daily on the loop. Since practically all of the traffic is into and out of the business district of San Juan a schedule was worked out, after careful study, by which all cars go into San Juan through the Santurce section in the morning until 10:30. At that hour the service is reversed in the loop to bring people out of San Juan directly into the Santurce section. Similar reversals are made at 12:30 p.m., 3 p.m., 7 p.m. and 9:30 p.m. By experience it has been found that these are the hours at which the demand for transportation reverses. The result of this schedule has been that the average speed of cars, including stops, has been increased from 7 m.p.h. with the old two-way service to 10 m.p.h. with the loop service, and this in spite of the growing traffic congestion in the city of San Juan.

Considerable time and energy have been devoted to popularizing street car riding by advertising freely in the local papers. A slogan was adopted that has become well known locally, Rapidez, Seguridad y Cortesía, which translated reads Speed, Safety and Courtesy. The company has endeavored by every means in its power to live up to these precepts. That the trolley offers the safest transportation in San Juan and that its staff is unusually courteous is now well recognized throughout the city, and that, because of the advantage of considerable private right-of-way the street car can generally make better time than other vehicles in the rapidly growing congestion of the city, the street car is daily gaining in patronage.

California Commission's Work

SEVENTEEN appraisals of properties of public utilities were engaged in by the valuation division of the engineering department of the California Railroad Commission during the fiscal year ended June 30, 1927, under seven condemnation, eight rate and two securing issue proceedings. Properties of five different types of utilities, located in various parts of the state, were included in these investigations. Property valued at many millions of dollars, easily in excess of $100,000,000, is included in the valuation work of this division, the figures themselves not being available at this time. Among the railways were the Key System Transit Company, Stockton Electric Railway, Los Angeles Railway, Pacific Electric Railway and the San Jose Railroad.



One of the new cars passing through the city of San Juan

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Apprentice Course Works Well in St. Louis

Four-year course, with concurrent training in trade school, attracts young men to railway shops. The majority stay with company after graduation

FOR the past eleven years, except during 1917 and 1918, the United Railways of St. Louis has been conducting an apprenticeship course in its shops, divided into electrical work, machine shop work, car building and car painting. Previous to 1916 the company used each year to engage a number of boys between the ages of sixteen and eighteen years for its shops, but as it had no plan of training them in the various branches of the work they did not remain long in its service. Particulars of the existing plan are given in the company's brief for the 1927 Coffin Prize.

Fortunately for the success of the present course, the St. Louis shops are near the David Ranken School of Mechanical Trades, a trade school with a high reputation in St. Louis. In planning its apprenticeship course, the company decided to offer to send its shop apprentices to this school if they would agree to take the company's apprenticeship term of four years. At this school the boys attend the night courses. Every apprentice must take at least two nights per week at the school, but has the privilege of attending four nights if he desires to do so. The courses taken by them include mathematics, drafting and applied science, and their tuition bills are paid by the United Railways.

The apprenticeship course under these conditions was started in 1916 with a maximum enrollment of 20 boys, divided in the electrical repair shop, machine shop, car building shop and paint shop. The rate of pay at that time was 12 cents per hour for the first six months of continuous service, with an increase of 1½ cents per hour at the beginning of each six-months period. This brought the rate for the eighth or final period to 22½ cents per hour. This rate necessarily has had to be increased under the present changed conditions.

In each department of the shops the boy starts in with the simplest work and gradually acquires experience in all branches of his trade. For instance, in the machine shop an apprentice is put on the drill press for the first six months. During the next 3½ years he is advanced from machine to machine until he has had experience in every kind of shop work in that department. In the other departments apprentices are likewise started with the simpler duties and moved higher as the course continues.

The only time that there has been any interruption to this system of apprentice training was during the war years of 1917 and 1918, when a number of the boys who had had one or two years training left. With the experience they had acquired they found it possible to obtain better paying positions in manufacturing plants in St. Louis. In 1919, after this artificial spurt in manufacturing was over, the company was able to go on with its course in the regular way.

Since the plan was begun in 1916, and up to June 1, 1927, nineteen apprentices had completed the four-year course. Of this number fifteen are still in the service of the company. At present 22 apprentices are taking the course. Of this number, six are in the armature room, four in the machine shop and twelve in the carpenter shop.

The company's experience has been that an apprenticeship course of this kind is entirely practical and beneficial both for the boy and the company in maintaining the necessary quota of skilled mechanics. The schedule followed is given in the accompanying table.

SCHEDULE OF WORK FOR APPRENTICES

Machine Shop:
First and second periods, drill press and bolt cutter.
Third and fourth periods, drill press and shaper.
Fifth and sixth periods, milling machine and lathe.
Seventh and eighth periods, planer and lathe.

Paint Shop:
First and second periods, rough work, cleaning, priming and surfacing.
Third and fourth periods, coating and brush-work.
Fifth and to eighth periods, brush and pencil work, striping and lettering.

Armature Room:
First period, sleeving and tieing coils.
Second period, winding coils.
Third period, taping coils.
Fourth period, taping fields.
Fifth period, winding fields.
Sixth period, repairing controllers.
Seventh period, stripping armatures.
Eighth period, winding armatures.

Carpenter Shop:
First period, stripping cars.
Second period, floors and framing.
Third period, car hanging.
Fourth period, car framing.
Fifth period, roof and side panels.
Sixth period, vestibules.
Seventh period, fitting sash and doors.
Eighth period, ceiling and trimmings.

After an apprentice has finished his course of four years work in the company's shop and has received the proper rating from the Ranken Trade School he is given a certificate of graduation by the company. His pay is then increased 22 cents per hour and he is retained in the service of the department in which he has been trained. Here his duties and rate of pay are comparable to the men in that department classed as journeymen.

Street Railway Operation of Buses in Germany

RECENT statistics compiled by the German Street Railway Association show that the 77 members of the association operate 1,064 buses and that four of these operate a total of 39 bus trailers. In the table compiled by the association the operating roads were grouped in four classes, as shown in the accompanying table. In the first group Hamburg leads with 58 buses and Dresden has 55. The third group covers small railroad lines outside of the German State Railway System and the fourth the Berlin General Omnibus Company. This road is classed by itself because it is controlled by the city of Berlin, which also owns the street railway system. Hence it is operated in non-competitive service with the Berlin street railway.

STATISTICS OF BUSES OPERATED BY MEMBERS OF GERMAN STREET RAILWAY ASSOCIATION

No. of Cos.	Type of Company	Number of Vehicles Buses	Trailers	Length of Line Kilometers	Miles
60	Street railways	546	39	2,161	1,351
10	Interurban railways	41	..	655	409
6	Private railway lines	46	..	496	310
1	Berlin Omnibus Company	431	..	307	192

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Maintenance Methods and Devices

Grease Lubrication for Brake Hangers

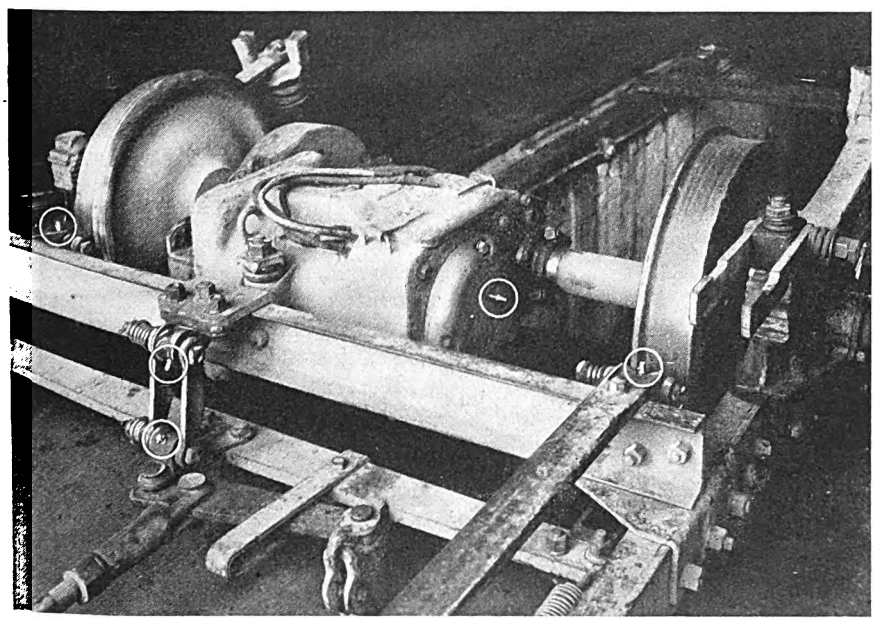
By J. Ed Lawless
Master Mechanic El Paso Electric Company, El Paso, Tex.

CONSIDERABLE reduction in time and cost for lubricating foundation brake rigging of electric cars has resulted through the use of Alemite fittings installed in various parts of the trucks by the El Paso Electric Company. This company has 40 single-truck Birney cars on which this method of lubrication has been installed. Economies have resulted particularly in the lubrication of half-ball hangers. It is difficult to lubricate the balls and sockets of these hangers as it is necessary to remove them both in order to get the grease in properly. One of the car truck inspectors of the railway conceived the idea of installing Alemite fittings on the shoe heads and hanger holders so that grease for lubrication can be forced into the sockets by using the standard high-pressure grease gun.

This plan has worked out very satisfactorily. As the cars are overhauled, each shoe head and hanger holder casting is drilled and tapped and a fitting is screwed in the end of the casting between the sockets so that grease injected through the fittings will be forced both ways along the bolt into the socket. Twelve fittings are required per truck. The time and labor of installing are small and the cost of the fittings amounts to only a few cents each.

The advantages of lubricating these parts by this method are shown in the reduction of time required. Tests were made to obtain actual figures of time and cost of labor saved. To remove the brake hanger bolts and put grease in the sockets requires 40 minutes' time of a truck inspector and his helper, 80 minutes for one man. This labor costs 47 cents. A helper can lubricate the hangers on a car equipped with Alemite fittings in four minutes at a cost of 2 cents for labor. The saving effected is one hour and sixteen minutes or 45 cents. The work of attaching the grease gun connection and injecting the grease is so simple that every car is assured of having the brake hangers lubricated at every inspection. The parts being amply lubricated will not wear nearly as rapidly and therefore the cost of maintenance is reduced. Also the noise of loose rattling brake hangers is eliminated.

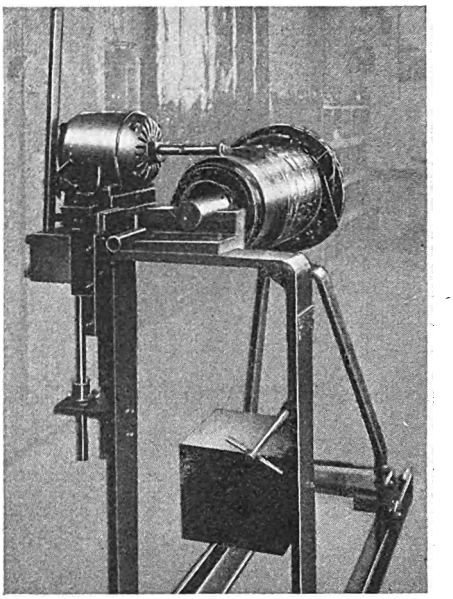
Try a "beauty shop" to keep your control fingers well manicured.



Circles indicate points on truck where Alemite fittings have been installed for lubrication

Convenient Commutator Slotter

IT IS not practicable in Atlanta to have the commutator slotter mounted on the machine where commutators are turned because bearings are fitted while the armature is in the lathe and the time does not permit of the additional work of slotting the commutator. Accordingly the slotter shown in the accompanying illustration was constructed in the shops of the Georgia Power Company. It is described in the brief submitted for the Charles A. Coffin Award. For the slotting operation the armature is mounted on V blocks on the stand. The pinion end V block is raised or lowered to level the armature. The depth to which the slotting saw will cut is regulated by an adjusting screw on the left leg of the stand, which raises or lowers the motor carriage.



Commutator slotter constructed in the shops of the Georgia Power Company, Atlanta, Ga.

The speed of the motor is 1,120 r.p.m. The saw is carried on an extended arbor which is adjustable to take care of various lengths of armatures.

The motor is mounted on a pivot which makes possible the slotting of commutators which are slightly skewed. The upright supporting the pinion end of the armature is adjust-

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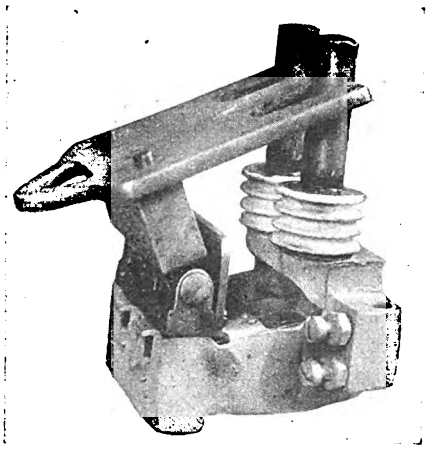
able to care for various lengths of armatures. This machine provides a clean-cut job, uniform slots and speedy work.

Aligning Carbon Box With Brush-Holder Studs

DUE to rough handling of brush-holders, either before they are installed in railway motors or during the process, the studs supporting the brush-holder framework may become bent, so that the carbon box is thrown out of its normal position in relation to the studs. To check brush-holders just previous to installation and make certain that correct position of the carbon box is maintained a special fixture is used in the 65th Street shop of the Third Avenue Railway, New York City.



Convenient type of fixture for gaging brush-holder studs and carbon brushways

This fixture has a metal block machined accurately to the same size as the inside of the brush-holder carbon box. For some types of brush-holders the block can be slotted so as to fit around the contact springs and tips that rest on top of the brushes. The upper part of the block has a projection which acts as a stop when inserted in the carbon way and also provides for pivoting an extension arm to gage the position of the upright supporting rods. In the accompanying illustration the fixture is shown inserted in the carbon box of a brush-holder and the extension arm is just engaging the insulator studs. Where these are in correct position the arm with the two slotted sections can be forced down into a position so that the hinged block comes against the stop at the back of the metal piece which fits in the carbon box and the slotted arm is at a right angle to this. The slots in the extension arm are machined accurately so as to form a gage for the studs. The metal block forms a gage for the inside of the carbon box. A handle at the end is used to remove the fixture.

Use of this type of fixture has remedied troubles from brush-holders being out of alignment when installed in motors. Also, correct fit of the brushes in the carbon ways is assured and flashing due to incorrect position of the brush-holders is eliminated.

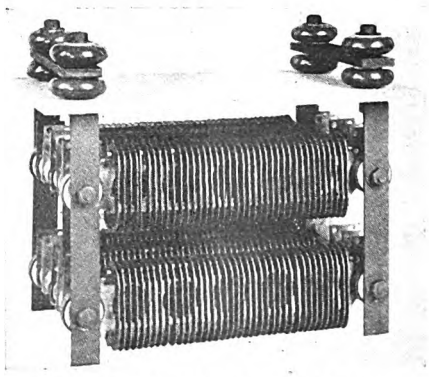
New Equipment Available

Edgewise-Wound Resistor

EDGEWISE-WOUND resistors, non-breakable and non-corrosive, have been placed on the market by the General Electric Company, Schenectady, N. Y. Resistors of this type are designed for use on electric cars, electric locomotives and gas-electric buses, and are particularly suitable where vibration and exposure to the elements tend to shorten the life of the more fragile cast-grid types of resistors.

The new resistor is light in weight. The six-unit type weighs approximately 50 lb. and the four-unit resistor approximately 40 lb. about half the weight of cast-grid resistors of corresponding capacity.

The resistor units are constructed of unbreakable, non-corrodible ribbon rolled from a special alloy. The joints are copper-to-copper and few in number, insuring minimum contact resistance. The ribbon is wound edgewise over heat-resisting and mechanically strong insulation, fitted over the edges of reinforced punched steel bars. The units themselves are supported on steel rods with secondary insulation of mica.



Form C, edgewise wound resistor

The units are elliptical, conserving space and permitting the use of more active ribbon. The alloy has a practically constant temperature coefficient, resulting in but slight variation in resistance. Its specific resistance is materially higher than that of cast iron.

Terminals welded to the ends of the alloy ribbon insure perfect mechanical and electrical joints. Terminals at the ends of the resistor frame simplify the connection of leads and also facilitate making various series and parallel combinations. Clamp terminals for connecting to intermediate turns of each unit permit accurate adjusting of each resistance step.

Any single-coil unit can be replaced without disturbing the others. Both the four-unit and six-unit edgewise-wound resistors are interchangeable with certain forms of cast-grid and other types of General Electric resistors, all having identically located supporting bolt holes. In many instances, however, fewer boxes can be used than are necessary with the cast-grid types.

Safety devices make cars safe, modern renewals make them save.

Ticket Printer for Use in Ticket Office

STANDARD size cardboard tickets are issued on demand by a machine announced by the Ohmer Fare Register Company, Dayton, Ohio. The new ticket printer turns a cardboard slip into a railway ticket instantly with the name of the station of departure and destination, the date, the ticket number, the amount paid, the number of miles and such special instructions as may be desired.

Not only are the tickets printed and issued accurately and quickly, but a complete detailed record of all the essential information is printed automatically in duplicate on two control tapes. One of these tapes is accessible to the ticket seller at all times and is used by him for the purpose of checking and balancing his receipts. The other control tape is for

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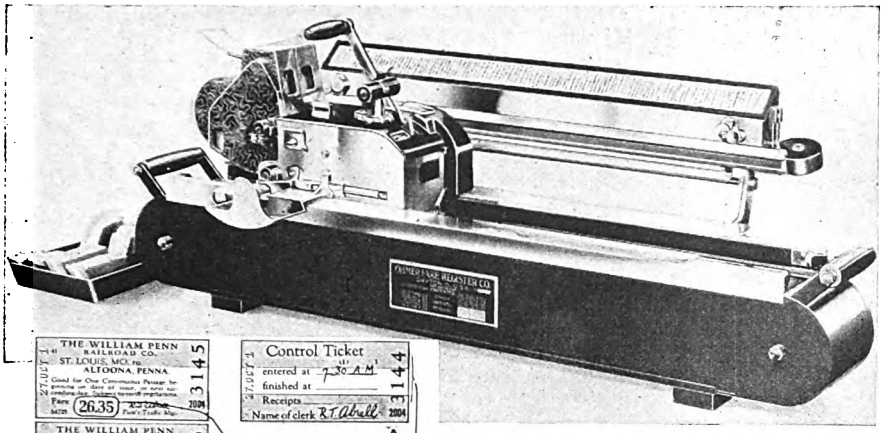
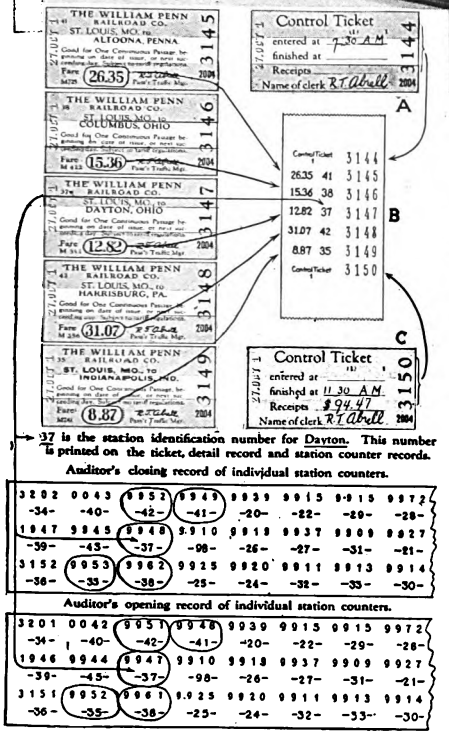


New type of printing machine for tickets to be used in ticket office



Sample set of tickets and records from an Ohmer ticket office ticket printer

A—Ticket seller's opening control ticket.
B—Ticket seller's detail record of all tickets sold. A duplicate of this record is locked in the machine for the traveling auditor.
C—Ticket seller's closing control ticket.

the use of the auditor and is accessible only to him or his authorized representative. It is removed at such times as may be desired for the purpose of checking and is filed as a permanent record of ticket sales.

In addition to the protection offered by the control tape, the machine is provided with segregating totalizers which are accessible to the auditor only, or his representative. From these totalizers may be taken at any time printed totals showing the number of tickets sold by the ticket office to any destination. From another automatic counter the total number of all tickets sold is visible at all times.

The ticket seller upon starting work prints and issues what is called a control ticket, upon which he enters his name and time of starting. At the end of his day's work he issues a similar ticket, upon which he enters the day's receipts and his name. He then becomes responsible for all tickets issued, as shown by the consecutive numbers between those of his starting and closing control ticket. The auditor's duplicate control tape bears a record of these control tickets so that no possible operation of the machine can be lost sight of.

In an accompanying illustration a series of five tickets are shown. The two control tickets were issued by the ticket seller to himself at the beginning and at the close of his working period. The closing control ticket gives the amount of sales as well as the quitting time. The first and last ticket numbers on the control record slip correspond with these two control tickets, and the five other numbers on the control record slip correspond to the numbers of the tickets actually sold. The amount of the sale appears on both the ticket itself and the control record slip, as do the figures representing the destination.

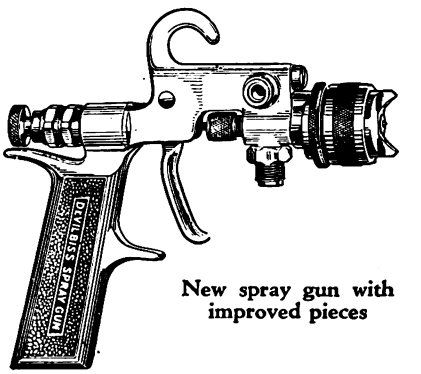
Taking ticket 3147, for example, we find it was sold to Dayton for $12.82. This amount also appears on the control record slip opposite the corresponding consecutive number, together with No. 37, representing the destination point (Dayton). No. 37 also appears on the ticket.

By following the line to the lower part of the illustration it is seen in the reproduced record taken from the segregating totalizer the opening count for tickets sold to date, namely, 9947, and, further up, the closing figure, 9948, showing that one ticket has been sold.

The mileage, as well as the amount of fare, is printed on the ticket. The ticket sold to Dayton for $12.82 shows M351, which indicates 351 miles. No. 2004, which appears on the ticket just below the consecutive number, is the station number from which the tickets are sold, in this case St. Louis. No. 2004 is also printed adjacent to the opening and closing numbers on the segregating totalizer for the total number of tickets of all kinds sold from that office.

Adjustable Head in New Spray Gun

FOR any spray painting system the principal unit is the gun. To provide for changed conditions in finishing and painting work, the De Vilbiss Company has just brought out a new spray gun with several improved features. One of these is the spray head with graduated adjustment to control both character and width of the fan spray. The graduated adjustment makes it possible to return quickly to a previous setting for producing any desired spray. The air can also be cut off to produce a round spray. This adjustable spray head eliminates split sprays and overspray and insures proper balance



New spray gun with improved pieces

between the amount of material used, the nature of the work and the speed of operation.

Another improved feature is the self-centering of nozzle parts, making it impossible for these to get out of alignment.

The new gun, known as type AV, has a construction such that with low air pressure ranging from 40 to 60 lb. and a minimum air consumption, the material is finely, softly and evenly atomized and a smooth, uniform coating can be put on. Perfect atomization and uniformity of coating reduce sanding time and rubbing labor to a minimum.

The fluid tip is made of high manganese chrome alloy steel, double heat treated and ground to gage. The body is made of a special high-strength, heat-treated, alloy aluminum drop forging.

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Association Activities

Human Engineering

By Charles M. Schwab
Chairman of the Board Bethlehem Steel Corporation

IF THERE is one outstanding slogan which serves as a common motto for American industry today, that slogan is expressed in the phrase "Safety First." The fact that this has become the outstanding slogan is an expression of the supreme management of American industry, namely, that the conduct of industry involves not merely the efficient direction of machines but primarily the guidance, the protection and the promotion of the welfare of human beings.

Human engineering—that's the real study of the great engineer of today:

Our railroads are realizing amazing results. I was told the other day that the great Pennsylvania Railroad has this fall been handling a volume of freight about equal to that of 1923 with one-third less equipment. Men are being paid better wages, conditions of work are being made better, the public is getting a better service; there is economy, profit and progress all around.

Our railroads, too, engaged in an occupation with many unavoidable hazards, give constant thought to safety—safety for their passengers, but, above all else, safety for the human being, without whom all the tracks, bridges, cars and locomotives in the world would not make possible the operation of a single railroad.

An unusual contribution to the promotion of healthy rivalry among railroads in attaining safety has been made by the American Museum of Safety. For some years before the war and since then—during the last two years—that organization has awarded annually, by virtue of the generous action of Mrs. E. H. Harriman, whose late husband was one of our greatest railroad men, the Harriman memorial medals, to those Class I steam railroads which, in their respective groups, have done the most during the year to secure progress in safety and accident prevention.

The gold medal for the year ended Dec. 31, 1926, has been awarded to the Norfolk & Western Railway. This railway has realized a most remarkable result, showing a reduction of 28 per cent in the number of persons killed for the year 1926, as compared with 1925, and of 15 per cent in the number injured. This result was obtained notwithstanding an increase of over 8 per cent in the number of miles run by its locomotives.

The members of the award committee were so impressed with the showing made by the Norfolk & Western Railway in 1926 that all members of the committee commented on it as one of the outstanding examples in recent years of the results of applying intelligent safety methods to railway operation.

The silver medal has been awarded to the Duluth, Missabe & Northern Railway. This company again shows a record of no passengers or employees killed during the year. This company realizes the additional distinction of winning the silver medal for the second year in succession.

The bronze medal is awarded to the Quincy, Omaha & Kansas City Railroad. This is a small railroad and one of the less prosperous, but it went through the entire year of 1926 without injuring a single passenger or employee.

I congratulate the management as well as the employees of each of these railroads upon winning these awards. Such results are not achieved by haphazard methods. The awards are made as a token of thought and vigilance during every hour of the day and night, the slightest lapse at any moment meaning danger if not disaster.

These railroads, and all the others who have participated in this competition, have made a new contribution toward the science of human engineering. May safety first and the welfare above all else of the human being continue to be the watchword of all our railroads and all our other industries.

Abstract of an address at a meeting of the American Museum of Safety at New York City, Dec. 28, on the occasion of the presentation of the E. H. Harriman memorial medals and special certificate to railroads for safety and accident prevention work in the year ended Dec. 31, 1926.

Program Announced for Midwest Meeting

MANY subjects of interest are listed on the program for the midyear meeting of the Midwest Electric Railway Association to be held at Hot Springs, Ark., Jan. 16 and 17. Following is the schedule of events for the two days:

Monday, Jan. 16

9:00 a.m.—Registration.

10:00 a.m.—Address of Welcome, F. Leslie Body, manager Hot Springs Chamber of Commerce.

10:10 a.m.—Response—F. G. Buffe, vice-president.

10:20 a.m.—"The Power of Leadership," by J. B. Wootan, editor *Public Service Magazine.*

11:00 a.m.—Résumé of the legislative situation at Washington, by Leslie Vickers, economist A.E.R.A.

11:30 a.m.—"Building Sales Instinct in Men," by R. C. Forman, Stone & Webster.

12:15 p.m.—Luncheon: (a) Subject, "Transportation Failures"—leader, R. C. Coffy, vice-president and general manager Fort Smith Light & Traction Company.

(b) Subject, "Mechanical Problems"—leader, W. J. Martin, chief engineer Northeast Oklahoma Railroad.

3:00 p.m.—Sightseeing trip for all delegates and guests.

6:30 p.m.—Banquet, Arlington Hotel; music by K. T. H. S. Orchestra and Missouri Pacific Colored Quartet.

"Relationship Between the Press and Public Utilities," by Walter M. Ebel, city editor *Sentinel-Record,* Hot Springs.

"The Industrial Opportunities of the Midwest," by Dr. C. H. Brough, former Governor of Arkansas.

Dancing.

Tuesday, Jan. 17

9:45 a.m.—"The Bus in Urban Transportation," by D. E. Druen, superintendent of bus maintenance Kansas City Public Service Company.

10:15 a.m.—"Developments in Modern Electric Railway Equipment," by Claude L. Van Auken, managing editor *Electric Traction.*

11:00 a.m.—"Municipal Transportation; Civic Responsibility and Performance," by C. M. Ballou, City Street Railway Commissioner, Cleveland.

11:45 a.m.—Business session.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 6*—Metropolitan Section, A. E. R. A., Engineering Societies Building, 39 W. 39th Street, New York, N. Y., 8 p.m.**

***Jan. 16-17*—Midwest Electric Railway Association, Hot Springs, Ark.**

***Jan. 18-19*—Kentucky Association of Public Utilities, annual meeting Brown Hotel, Louisville, Ky.**

***Jan. 18-19*—Central Electric Traffic Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25*—Central Electric Railway Master Mechanics' Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 25-26*—American Railway Association, Motor Transport Division, organization meeting, Palmer House, Chicago, Ill.**

***Jan. 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Roosevelt Hotel, New Orleans, La.**

***Jan. 26-27*—Central Electric Railway Association, Hotel Gibson, Cincinnati, Ohio.**

***Jan. 31*—New York Electric Railway Association, annual meeting. Hotel Commodore, New York, N. Y.**

***Feb. 13-17*—American Institute of Electrical Engineers, winter convention, New York, N. Y.**

***Feb. 17-18*—Central Electric Railway Accountants' Association, Hotel Gibson, Cincinnati, Ohio.**

***May 2-5*—Southwestern Public Service Association, Dallas, Texas.**

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention, Cleveland, Ohio.

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News of the Industry

I.C.C. Grants Increase on North Shore Line

Intrastate passenger fares on the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., were ordered raised from 3 cents to 3.6 cents a mile by the Interstate Commerce Commission on Dec. 22. The increase, which was granted in order to remove unjust discrimination against interstate commerce, is to become effective on or before Feb. 15.

Appeal to the Interstate Commerce Commission was resorted to by the railroad following the refusal of the Illinois and Wisconsin Public Utility Commissions to allow an increase in rates within the two states. Claiming that the intrastate fares of the North Shore Line from Chicago to competitive Illinois points and from Milwaukee to competitive Wisconsin points ranged from 4 to 23 cents less than those of its steam railroad competitors and that on this account interstate passengers were being discriminated against, the railroad took its case before the federal commission. The interstate fares of the North Shore Line were increased last spring from 3 to 3.6 cents per mile, to match the steam railroads' tariffs.

Protection Sought for Car Men in Memphis

Two-men cars and armed guards on outlying runs are to be demanded by the trainmen in Memphis, Tenn., as a protection for car operators against bandits. This is the aftermath of the recent slaying of Robert H. Calvery, motorman on the Chelsea Avenue Line of the Memphis Street Railway. As a protection for its men the company meanwhile is employing special officers and plain clothes men to ride on cars making outlying runs. It has also offered a $500 reward for the apprehension of the slayer of Mr. Calvery. The union is offering a like reward.

Recommendations by New York State Mayors

The New York State Conference of Mayors, sometimes called the "third house" of the Legislature, will supplement the Governor's message by sending to that body its recommendations when the Legislature meets in January. Regarding utility legislation, the conference said it would urge the enactment of legislation of a permissive character which would give to the municipalities the right to acquire, construct, own, lease and operate within or without their corporate limits any public utility, product or service of which it was or was to be supplied to the municipality or its inhabitants, or to enter into contract for such service.

It would further urge the Legislature to enact a law which will give cities authority to own and operate buses.

Ceremonies Attend Power Station Opening at Norfolk

The new several million dollar addition to the Reeves Avenue power station of the Virginia Electric & Power Company at Norfolk, Va., was formally opened on Dec. 7. Special ceremonies were arranged for the opening which makes the plant one of the largest in the South and virtually doubles its capacity.

One-Man Cars to Be Run Over Steam Tracks in Sharon

Permission to operate one-man cars over steam railroad tracks in the city of Sharon, Pa., has been granted to the Shenango Valley Traction Company by the Pennsylvania Public Service Commission. Before the company can install the one-man operation the commission directs that it must adopt certain safety conditions.

The Shenango Valley Traction Company operates a line 17.73 miles. Its one-man cars will now run over the tracks of the Erie Railroad in Sharon, Pa. Train movements over the crossing are largely industrial and average about eight a day.

Atlanta Company Praised

State commission says that railway patrons in Southern city have enjoyed a fare for the past nine years that experience has shown to be too low

IN ITS opinion in the Atlanta fare case fixing the new fares on the city lines of the Georgia Power Company at 10 cents cash with four tickets for 30 cents or twenty for $1.50 the commission said that experience has demonstrated beyond question that the commission in the 1918 and 1920 cases fixed a fare too low. The state body says that if it had provided a reasonable fare in 1918 and 1920, the recent application would have had no excuse for existence at this time. The same authority says it may appear to some as unfortunate that this was not done, but be that as it may, patrons of the railway have enjoyed a fare for the past nine years that experience has shown to be too low.

Considering the scant earnings of the company for a long number of years, the commission did not feel justified in doing less than had been concluded to be reasonable, but at the end of twelve months from the effective date of the order just entered the commission will consider the earnings of the company under the new scale of rates, and if conditions at that time justify it, the commission will take proper steps to make due corrections.

In the commission's opinion the Georgia Power Company is now rendering the best railway service in its history, and certainly far in excess of any period experienced by any of its predecessors, due in no small degree to the splendid personnel in the operating department, "the motormen, conductors and other employees in the railway department being composed of as high a type of men as will be found anywhere in the United States." The commission says:

As shown by the record in this case the company operates under conditions which prevail in comparatively few cities throughout the country. The physical values of the railroad property include approximately $4,000,000 for paving the streets traversed by the various lines of applicant, which is required under franchises. It is also shown from the record that the company is required to pay to the city of Atlanta a gross receipt tax of 3 per cent of all revenues taken in. As a result of this street paving cost, there is charged to operating expenses approximately $100,000 for depreciation, and there is included in the return resulting from the rates approved herein $280,000, or a total of $380,000, which must be paid by the car riders on account of this street paving cost. As a result of the 3 per cent gross receipt tax, there is to be charged to expenses approximately $180,000. In other words, there is to be added to operating expenses, which results in a deduction from the net income, $560,000 per annum, due to the paving charges and gross receipt tax. These charges to operating expenses are conditions over which the commission has no control, but at the same time it is obviously necessary that these items of operating cost be considered in determining such a rate of fare as is necessary under conditions enumerated herein.

In the early part of 1924 the company petitioned the Mayor and Council of Atlanta for relief, and, among other things, asked the City Council to approve fares covered by the company's petition in the recent case. The record shows that the City Council advised the company it had no jurisdiction over the car fares, and without expressing an opinion for or against the petition, suggested that it was a matter to be considered by this commission. During the proceedings before the City Council it was agreed between the company and

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Council that a valuation and audit should be made of the company's street railway property and its records, the cost of same to be paid by the company, whereupon the city employed nationally known engineers and auditors to do this work.

It was contended by the company that it was not earning a reasonable return on the fair value of its property devoted to the public use. Evidence submitted at the hearing showed a decrease in net earnings for the years 1921 to 1926, inclusive, except the years 1924 and 1925. The commission said:

In order to determine whether or not the company is earning a reasonable return, it is first necessary to determine what is the fair value of the railway property devoted to the public use on which the company is entitled to earn a reasonable return. In this case, the company submitted various values. What is known as the historical, or cost value, is based upon the value found by Engineer Baehr, in his appraisal as of March 18, 1912, which was made with the intention of leasing the properties of the Georgia Railway & Electric Company to the Georgia Railway & Power Company. The physical property, as found by Engineer Baehr at that time, excluding jointly used property, but including overhead charges, was $8,766,673. Additions and betterments to the property, not including jointly used property, from 1912 to Dec. 31, 1926, amounted to $7,378,162, making a total historical cost value of the physical properties, excluding jointly used property, but including overhead charges, as of Dec. 31, 1926, $16,144,836. Based on this historical cost, and adjusted to prices current as of Jan. 1, 1927, loss accrued depreciation, gives a value of $21,989,421.

The record shows that Engineer Baehr made another appraisal of the property, as of July 1, 1921, and the physical value found by him on that date, reproduction cost new, less depreciation, was $17,813,099. Additions and betterments to the property from July 1, 1921, to Dec. 31, 1926, amounted to $4,805,865, or a total value, less accrued depreciation, of $22,618,964. The value found by Engineer Beeler, in his appraisal for the city of Atlanta, excluding jointly used property, with additions and betterments to Dec. 31, 1926, is $19,614,216.

Engineer Luick submitted an appraisal as of Jan. 1, 1927. Mr. Luick's physical value as of that date, less depreciation, and excluding jointly used property, was $20,402,860. The physical value found by Mr. Luick, less depreciation, including jointly used property, as of Jan. 1, 1927, was $22,885,039.

It will be seen that all values above referred to do not include any amount for working capital or going concern value, which should be given consideration for rate-making purposes. Engineer Luick took the position that $450,000 should be allowed for working capital and $2,500,000 as going concern value, in the present case.

The commission did not in 1918 or 1920 nor has it in this case considered capitalization as a basis for the rates. The fair value of the property used and useful is the only basis the commission has at any time considered for the company, or any other company over which it has jurisdiction, in arriving at a fair value to determine a fair return.

The commission said:

Having in mind the consideration given by this commission of applicant's street railroad property, it is not surprising that in December, 1924, John A. Beeler, consulting engineer of the Beeler Organization of New York City, found occasion in his report to the city of Atlanta, dealing with street railway property of applicant, to express himself as follows: "With these rates of fare under the present operating conditions, eleven of the 22 railway lines are not taking in sufficient to pay the operating expenses. If this condition is not speedily righted, it is evident that the railway will not continue to function properly, and will be unable to finance itself. Properly to care for the growth and development of the community the additions and improvements outlined in this report must be made. This involved large expenditures, as is shown further along. To obtain the necessary funds, the financial condition of the railway must be radically changed. To accomplish this, either the revenues must be increased or the expenses decreased, or both. As shown elsewhere in this report, the net earnings this year (1924) are estimated to be $566,358, or sufficient to pay a return of 8 per cent on only $7,090,000. The discrepancy between these earnings and those necessary to place the railway on a sound footing is so great that the seriousness of the present situation is obvious. There is no time to permit of any unnecessary delay in adopting effective corrective measures, drastic though they may be. If the chief transportation agency of the community is to be paralyzed, it is not to be imagined for an instant that the results will stop there. The whole social, commercial and industrial fabric is dependent upon the proper functioning of the local transportation system, for it is to the community what the circulatory system is to the human body. Interfere with it and disaster is invited; kill it, and the community dies with it."

It will be recalled that the Beeler Organization was engaged by the city to study the transportation system in Atlanta.

The commission says that experience has demonstrated that it was too conservative in its judgment of what the future would reveal, with the result that the railway business would have long since been paralyzed had it not been for the sustaining credit and support of the company's light and power and gas properties. The company said:

Appearances Are Deceiving

There appears to be a common belief in the community served by the railway department that the highly maintained property in the way of roadway and equipment, is all sufficient evidence that the railway department has been prosperous, else this highly maintained condition would not exist. Nothing could be more erroneous. It is also apparent that there is a general belief that the large number of new cars purchased by this company during the last three to four years comes out of earnings, which is another error and without any foundation for its support.

On the question of valuation the commission said:

The Supreme Court of the United States, to our mind, has not been as definite in prescribing rules as a guide for arriving at a fair value as a proper rate base, as we believe should have been done. However, considering their expressions on this subject as a whole, it is very clear that they loan more to the reproduction cost new theory than to any other method. It is our belief that a strict adherence to the reproduction cost new theory would not be best for the company or the citizens it serves. Conditions could happen, as they have happened in the past, which, to apply such a method, would work disaster for the company as well as a hardship on the public, in so far as such would result in the loss of service. Such a theory, if applied in the last half of 1914, 1915 and 1916, would have bankrupted most of the companies throughout the country. However, taking the rates as approved in this case, applied to 1926 business, will not yield more than a reasonable return on a valuation far below the application of the reproduction cost new theory, plus going concern and working capital.

It was the opinion of the commission that the value of the railway property under consideration in this case, as of Dec. 31, 1926, was not less than $20,000,000 for rate-making purposes.

	1914 Wages per Hour Cents	1914 Per Cent	1920 Wages per Hour Cents	1920 Per Cent	1926 Wages per Hour Cents	1926 Per Cent
Motormen and conductors	25	100	46	183	59	238
					54	215
Cost of living	...	100	...	210	...	168

One of the largest items of expense in the railway department is that of transportation cost, represented largely in the wages of motormen and conductors. The accompanying table shows the wages paid motormen and conductors during the years 1914, 1920 and 1926, as compared with the average cost of living in Atlanta during these years, using the wage scale and the living cost, as prevailed in 1914, as 100 per cent.

The record shows that the wage increase just indicated was made by arbitration. The wages shown in the record for 1926 are 54 cents per hour for two-man cars and 59 cents per hour for one-man cars. The commission, of course, has no control over this question.

The following is a statement of revenues and expenses for the year 1926:

Operating expenses	$3,720,165
Taxes	413,156
Depreciation	394,192
	$4,527,514
Revenue	$5,278,794
	4,527,514
Net	$751,280

Based on a value of $20,000,000 the net revenue just noted represents a return of approximately 3.8 per cent on the railway property of the applicant. The commission says this cannot be justified as a reasonable return, and shows conclusively that an increase in revenue is demanded.

The fare in Atlanta has been 7 cents cash, three tickets for 20 cents or fifteen for $1. There have been no children's rates. Under the new schedule school children are to pay a fare of 5 cents, but only when tickets are bought by them in lots of twenty for $1 at the company's office on presentation of a certificate signed by the principal or teacher. These tickets are to be good on schooldays between the hours of 7 a.m. and 4 p.m.

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Liberal Franchise Granted to Key System for Richmond

A new street railway franchise has just been granted by the City Council of Richmond, Cal., to the Key System Transit Company which will become operative on Jan. 6 and continue in force for 50 years. It is one of the most liberal franchises ever granted to a railway, for in it the principle is recognized that the railroad should not pay for paving and that so long as the company lives up to the terms of the franchise the city has no right to grant competing lines other franchises. With this grant Richmond becomes the only city in California with a population of less than 25,000 persons which has a local street car system.

According to the provisions, referred to in the ELECTRIC RAILWAY JOURNAL for Dec. 24, page 1167, the city agrees to bear all the expense of repaving when such is made necessary by plans for regrading, improving the surface or changing the quality or quantity of the paving originally installed. The company agrees to make necessary repairs between its tracks and for a distance of 2 ft. on each side of them. It is further provided that the company shall not be required to relocate, move or rearrange any of its tracks, poles or wires for a period of three years from the time the franchise goes into effect. J. Paul St. Sure, an Oakland attorney, drew up the franchise. Negotiations of the company with the city were conducted by Paul Goldsmith, vice-president in charge of public relations.

Sunday Passes Sell Satisfactorily in San Francisco

One of the latest steps taken by the Market Street Railway, San Francisco, Cal., is the installation of a pass good all day on Sundays and certain holidays. As the company expresses the matter in the *Inside Track*, "judging by the ever-increasing number sold each week, 'it' is being very kindly received by our patrons."

Competition in selling these passes between conductors at the different divisions is getting so keen that the company is thinking about printing the names of the ten super-salesmen who sell the highest number of passes each month.

One conductor, who has been very successful so far, explained that he offers a pass to each boarding passenger, and says: "Ride all day! Only 20 cents!"

Existing Rates in Watertown Continued

The Public Service Commission authorized on Dec. 23 the Black River Traction Company and the Watertown Transportation Corporation, its subsidiary, operating in Watertown, N. Y., to continue its existing fare rates, 10 cents cash fare, seven tickets for 50 cents, until otherwise ordered by the commission. It was held that in view of continued operating losses sustained by the two companies and the action of the Watertown City Council in consenting to indefinite charge of the present fares the petition by the two companies should be granted.

Evidence submitted to Commissioner Brewster showed that the net deficit of the company in 1926 was $4,333 and for the first ten months in 1927 $4,511. The company in the past two years, by reducing its operating expenses, has decreased the deficit, but according to the memorandum by Commissioner Brewster there was no prospect of net earnings. Testimony also showed that the total revenue of the bus company for 1926 was $92,425, while its expenses of operation were $95,263, showing an operating loss of $2,837, and for the first ten months in 1927 there was an operating deficit of $4,467.

Problems of Greater Boston Transit Reviewed

The establishment of electric service over the Saugus branch of the Boston & Maine Railroad terminating at the rapid transit station in Everett, Mass., is discussed in the report regarding service in Greater Boston issued by the Division of Metropolitan Planning. This would be much more feasible financially, the report states, than the plan of running through rapid transit trains. Freight service must be maintained even though steam passenger service on the Saugus branch is abandoned.

Service by trolley is now furnished from Saugus to Lynn by the Eastern Massachusetts Street Railway, but to establish through service coincident with the use of the tracks for freight service the Metropolitan Planning report states that such service should be jointly operated by the Eastern Massachusetts and the Boston Elevated, the Elevated receiving all fares west and the Eastern all fares to the east.

Regarding through service from Boston to Chelsea and Revere the report mentions that there is already through service from Revere Beach to Maverick Square, the cars of the Eastern Massachusetts Street Railway operating over the tracks of the Elevated to that station and that both railways express a desire to accommodate the public. The injustices to the citizens of Chelsea and Revere on their not enjoying the privilege of a single street railway fare from their respective cities to downtown Boston and other parts of the metropolitan district was condoned. The Metropolitan Planning Board takes the position that in all probability acquisition of the Chelsea Division by the Elevated must be accompanied by some contribution from the two cities benefited. But the report expressed doubt whether the Eastern or the Elevated would act in this important matter until the Legislature had finally determined the future status of these two properties and decided whether public control over their operation was to continue.

Viaduct Contract Approved at Atlanta

Mayor Ragsdale of Atlanta, Ga., and President Preston S. Arkwright of the Georgia Power Company have approved a contract with the Georgia Power Company, Atlanta, Ga., whereby $400,000 will be contributed by that corporation toward the construction of the twin viaducts at South Pryor Street and Central Avenue. Actual signing of the contract makes the money available immediately. The contract, according to Mayor Ragsdale, assures ample funds for the completion of the two spans, the city's $1,000,000 having already been augmented by $500,000 from the county and $400,000 from interested railroads.

The contract provides that the present "jitney" ordinance remain in effect, but that in the event of its repeal the city shall pay the company $50,000. The agreement further stipulates that the $400,000 shall be charged against capital expenditure and used in rate making by the company; that interest on the $400,000 shall be paid the power company by the bank in which the money is deposited, until it is used for construction; that the power company shall have the right to lay tracks on both viaducts, and that it shall be assessed no part of the paving charges nor shall it be charged for maintenance save for its poles, wires, etc.

Special Service on Xmas Day in Memphis

Co-operating with the churches and as a convenience to its patrons the Memphis Street Railway, Memphis, Tenn., operated an early schedule of cars on Dec. 25. This provided for a run arriving uptown at 5 a.m.

Federal Tax to Be Deducted from City Payment in Chicago

Under a decision handed down by the Illinois Supreme Court on Dec. 20 the Chicago Surface Lines is authorized in computing the amount due the city of Chicago under the 1907 ordinances to deduct federal income taxes paid to the government. As a part of operating expenses the city sued the Surface Lines for $2,338,596 on the ground that the companies had no right to deduct federal income and excise taxes before computing the 55 per cent of net receipts due the city and insisting also that the city was entitled to interest on amounts tendered by the companies but refused by the city during the years 1920 to 1923, inclusive. The issue on deduction of federal taxes extended over a period of nearly seventeen years. The Chicago Surface Lines opposed both claims and its contention was upheld by a decision of the Appellate Court.

The city filed a petition for a writ of certiorari for appeal to the Supreme Court and in denying this plea the court sustains the Appellate Court decision.

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Repeal of Half-Fare Rates for Massachusetts Pupils Opposed

Opposition to the repeal of half-fare rates for school pupils in Massachusetts was voiced by the Commissioners of the State Department of Public Utilities in a special request to the Legislature filed on Dec. 20. This body unanimously recommends against the repeal of the general law under which street and electric railways are compelled to transport pupils of public day or evening schools, vocational or private schools at not more than one-half the regular fare, "because of the doubt of any material benefits to many of the street railway companies and because of the obvious benefit of this statute to many people of small means, with families large and small, under the burden of obtaining an education for their children."

At the same time, the commissioners found that the statute was abused and while making no change in the fare rate, recommended that they be authorized to adopt such rules and regulations as might be deemed advisable to control the use of pupils' tickets.

In its report the commission said that the basis of the argument was the financial condition of the New Bedford & Onset Street Railway, serving the towns of Marion, Wareham and Mattapoisett and the desire of those towns to assist the railway in every possible way in order that it might continue operations. These towns paid for the transportation of their pupils and at least two of them, by votes in town meetings, indicated a readiness to pay full fare. This they could not do under the law.

The report is based on a resolution of the Legislature, directing an investigation of the subject, which was passed at the last session.

Co-ordination of Traffic Chief Problem in Chicago

A unification of the maze of conflicting traffic regulations in Chicago, Ill., resulting from divided authority among the police department, the various park boards and the country towns is to be attempted by three groups of experts authorized by the Greater Chicago Traffic Committee, which has been organized with Richard W. Wolfe, Commissioner of Public Works, as chairman and James Simpson, head of the city plan commission, as vice-chairman. Three sub-committees of five members each will take up the work of unification and co-ordination.

One of these sub-committees is made up of attorneys and is to work out a system of unified traffic laws. Another, comprising representatives of the police departments, is to evolve a system for the enforcement of regulations decided upon, and the third will consist of engineers who are to work out signal control and other technical problems.

The traffic committee was created a year ago in an effort to determine upon a code for the regulation of the movement of vehicles in the city and co-ordinate the rules of the 26 different governing bodies. Among the members of the committee are the Mayor, Commissioner of Public Works, City Comptroller, Chief of Police, three Aldermen, representatives of the Park Board and the chairman of the Council traffic committee.

Mayor and Comptroller of New York Bury the Hatchet

Mayor Walker and Comptroller Berry of New York have reached an agreement on the subway financing program of John H. Delaney, Transit Commissioner, whereby the Comptroller will raise no further objections and will certify in the 1929 budget to the necessity of amortization of $50,000,000 short-term subway construction bonds to be issued early next year. The Comptroller will not certify to the necessity of $13,000,000 amortization item in 1928 budget as was desired by the Mayor. The Comptroller believes the Delaney subway financing plan illegal and Leonard M. Wallstein, counsel for the Citizens' Union, will seek to get an injunction against the issue of $50,000,000 bonds as soon as they are advertised for sale.

Bus and Rail Employees in Akron Have Equal Educational Chances

Following successful results obtained from its school for bus operators, the Northern Ohio Power & Light Company, Akron, Ohio, has established a permanent training course for its electric railway operators. A course of study covering a period of six months, similar to that in use in the school for bus men, has been adopted. Schools have been established in Akron, Canton and Massillon. Dwight Foust, a former dispatcher and graduate of Wittenberg College, has been chosen instructor. The school has in no way changed the initial training received previously by new employees. This training continues.

Old employees in train service are required to attend one session of the school each week in each of the three cities. Training is by lecture and the schoolrooms are equipped with all the mechanical and electric devices in use on cars. Particular attention is paid to motors, safety devices, door operation, courtesy and safety. Plans call for completion of the course in six months with reviews every six weeks.

Not all of the trainmen are going through the school at one time, but the schools are to continue until every employee in the service either passes or fails the examination. Failures are not to be retained. When all have gone through school, future courses will be confined to new employees. It is not the intention of the company to have employees go through school and then drop the work. The trainmen will be required to attend school sessions at intervals following their graduation.

It will be recalled that the work of the Akron bus school was demonstrated at the convention in Cleveland.

New Franchise for Canton

A new form of franchise to be submitted by the Northern Ohio Power & Light Company in January to the newly organized City Council of Canton, Ohio, will call for a traffic commissioner, a service-at-cost-plus plan of fare and exclusive control of the transportation facilities of the city. It was expected that the franchise would be presented to the old Council because of its understanding of the transportation situation and study of the Beeler organization survey, but more time was involved in the preparation of the franchise, according to an official, than at first was thought necessary and it could not be placed in form for submission to the old Council.

The plan of operating under a city railway commission would follow that of Cleveland, where the Tayler grant is observed.

Subway Freight Contract Before Rochester Council

The subway freight contract that will be submitted by the city of Rochester, N. Y., to the New York State Railways and the five railroads entering Rochester was introduced in the Common Council on Dec. 13 by Alderman W. J. Ward, chairman of the Railroad Committee, and Alderman Patrick Cauley, chairman of the law committee. It was referred to the two committees for a public hearing.

The contract was drafted by Corporation Counsel Clarence M. Platt, who discussed its provisions with Mayor O'Neil and Frederick T. Pierson, president of the Common Council. These follow principally the provisions of the contract between the city and the New York State Railways whereby the subway is operated under the direction of Charles R. Barnes, commissioner of railways, as an extension of the service-at-cost contract.

It included provision for freight operation and incorporates the recommendations made by the Mayor's subway committee, of which John P. Morse is chairman. The New York State Railways agrees to handle expeditiously all freight cars between the railway's connection with the subway railroad and points on the subway, performing equal service without discrimination for all carriers having similar agreements for trackage rights over the subway and for all shippers and consignees.

Safety Campaign in St. Joseph

A safety movement has been started by the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., with the organization of a safety committee. Fred E. Henderson, superintendent of the railway, was made chairman of the committee. A definite program has not been outlined. The object of the committee is to promulgate principles on safety among railway employees and public. Meetings will be held regularly.

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Subway Construction Plan Suggested by Mayor Thompson

Announcement of a new plan for subway construction in Chicago was made Dec. 29 by Mayor William Hale Thompson. He proposes widening and double decking the streets by building a level below the present street level. On either side of an open sunken roadway would be two rapid transit tracks for electric railways and above these tracks, on the original street level, would be roadways for trucks and slow-moving vehicles. The sunken roadway in the center would be given over to high-speed automobile traffic. The Mayor states that his plans are tentative only, subject to public approval.

Corporation Counsel Ettelson ruled recently that under the law assessments for subways can be spread over a period of twenty years instead of five years. It is thought this may obviate the need of special legislation for subway construction.

$800,000 Expenditure Suggested for Toronto Rehabilitation

Double-tracking the Mimico radial line as far as the Etobicoke and making it an extension of the city system of Toronto, Canada, at a cost of $800,000, is the outstanding plan in a report submitted recently to the Board of Control by the Toronto Transportation Commission. The cancellation of licenses of bus services running in competition with the lines is a condition of the plan. The board deferred action pending consideration of the matter by city officials.

The report concerns mainly an agreement entered into by the commission, the municipalities of Mimico, New Toronto and Etobicoke and the Minister of Highways, whereby the tracks on the Mimico line would be laid double in the center of the new paved highway and the line made an extension of the city service. Separate fares would be charged outside the city. Cancellation of the licenses for buses, which are said to have seriously impaired the earnings of the railway and provision of a through service with city cars making possible many economies by using joint facilities, were emphasized in the report. The report says:

> The money for capital construction would be provided by the investment of the T.T.C. reserves, and the city would not be required to issue further debentures for this radial. While we do not estimate that a surplus will be possible on this line, neither do we anticipate that, once established, the reconstructed line will be a burden to the city system.

The report refers to the transfer of the line to the Toronto Transportation Commission last January, when the annual deficits were approximately $110,000. The estimated increase in revenue through improvement in the service and elimination of bus competition is $98,000. A loss to the city system of $150,000 annually by buses bringing passengers to the center of the city would also be eliminated, it is thought.

The agreement with the municipalities provides that the T.T.C. shall double-track its line and remove it to the center of the highway; maintain connections with the city line; charge fares not greater than are sufficient to maintain the railway; and that the municipalities, so far as lies in their power, shall prevent the operation of competing transportation.

New Regalia for Cincinnati Men

All motormen, conductors, coach operators and supervisors of the Cincinnati Street Railway, Cincinnati, Ohio, have just been fitted out with new standard badges, while the supervisors have also been equipped with new overcoats which complete their new outfits.

Dignified insignia on Cincinnati caps

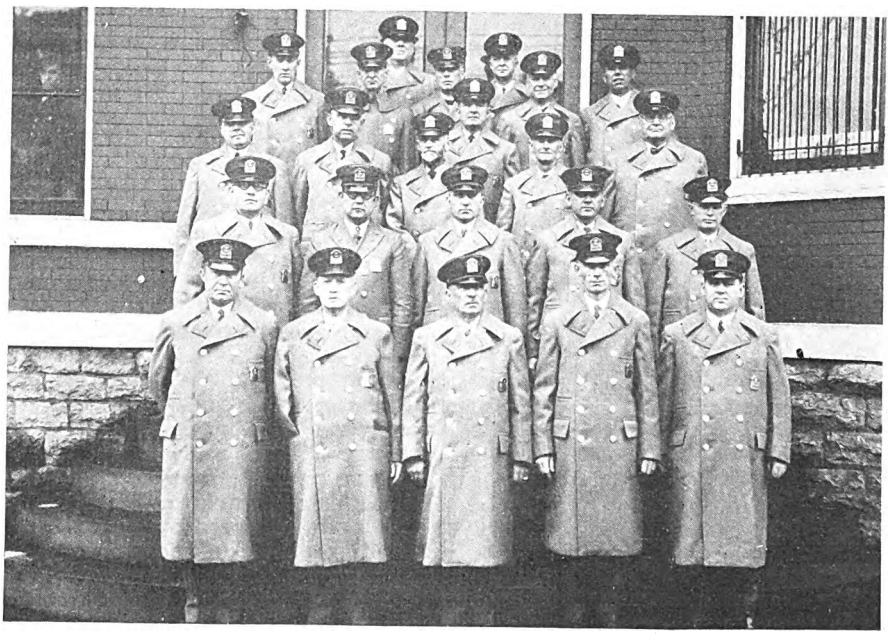
The new badge is the same standard design for all groups, but it has the official appearance of a policeman's badge. The company's trade mark is reproduced in the upper section in its regular colors and the identification marks, i.e., position or number, appear in the base.

The motormen's and conductor's badges are worn on the front of the caps only. They are nickel-silver finish. They carry the number of the man on the identification plate. Those worn by the coach operators are bronze, and in addition to numbers they carry the words "Coach Operator" on the identification plate. These are also worn on caps only. Both the street car and motor coach supervisors' badges are gold plate. In the case of the srteet car supervisors the word "Supervisor" appears alone, while the words "Coach Supervisor" are used to identify the other group. These supervisor badges are worn on the chests as well as on the caps. The Whitehead & Hoag Company, Newark, N. J., made the badges.

Formerly the men wore two number plates, one on each side of their caps, and a long name plate on the center of their caps. The nameplate carried the word "Conductor," "Motorman" or "Inspector" along with the operating company's name.

In addition to changing the entire character of the badge the numbering system has been revised. Conductors and motormen have hyphenated numbers, that is, 9-150. The first numeral designates the division and the second the man's number in that division. Even numbers are used for motormen and the odd for conductors. The numbers of coach operators are not hyphenated. They run from 100 up.

The new overcoats which the supervisors just donned were the last thing needed to complete their outfits. They now look like a staff of French generals on parade. These new coats are made of 24-oz. poilu gray serge overcoating. They were tailored by the Fechheimer Brothers Company, Cincinnati, Ohio.



Appearance counts more than ever in Cincinnati

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Santa Barbara Case Reported

California commissioner sees need for increased patronage through modernizing and merchandising methods. Results of new fare plans discussed

RESULTS of the study of possible means of increasing the net income of the Santa Barbara & Suburban Railway, at the same time maintaining good service and reasonable rates, were submitted at a hearing before Railroad Commissioner William J. Carr on the application of that company for an increase of rates, held at Santa Barbara on Dec. 9.

The report was submitted by J. G. Hunter, transportation engineer of the Railroad Commission, who has conducted a thorough investigation of the operating and financial conditions of that utility, assisted by Ward Hall and W. H. Gorman, engineers of the transportation division of the Railroad Commission.

Mr. Hunter reported that in his opinion the solution of the problem of obtaining revenues sufficient to meet the operating needs of the company and still allow a fair return upon the property will not be met entirely by an increase in fares. His conclusion is that the most important need of the company is not so much increased rates, but an increase of patronage. A city of the size of Santa Barbara presents real difficulty in determining the best course for a transportation company to follow in order to increase its patronage, thereby increasing the net income. For this reason the commission's engineer urged that the company should lend every effort to obtain more passengers. Engineer Hunter reviewed in his report a number of ways whereby this might be accomplished. Among these plans are low bargain rate fares during the hours 9 a.m. to 4 p.m., aggressive merchandising methods by the company to build up its revenue, improved service, upholstering its cars with leather seats, faster service, neater cars and less noisy operation.

The report deals with a number of plans emphasizing the need for getting away from odd coin fares, and the use of the weekly pass. The following fare plans are discussed in the report:

1. 8-cent straight cash fare.
2. 10-cent straight cash fare.
3. 10-cent cash fare—$1 weekly pass.
4. 10-cent cash fare—$1.25 weekly pass.
5. 10-cent cash fare—three tokens for 25 cents, $1 weekly pass.
6. 10-cent cash fare—three tokens for 25 cents, $1.25 weekly pass.
7. 10-cent cash fare—three tokens for 25 cents, $1.50 weekly pass.
8. 10-cent cash fare—5-cent midday fare, $1 weekly pass.
9. 10-cent cash fare—5-cent midday fare, $1.25 weekly pass.
10. 10-cent cash fare—25-cent weekly pass, entitling rider to 5-cent fare.
11. 10-cent cash fare—five tokens for 35 cents, twenty tokens for $1.

The estimated results of operation under the present fares during the year 1927 were computed by the commission's engineers as follows: Operating revenue, $123,450; operating expense, $121,000; depreciation (6 per cent sinking fund annuity basis) $11,194; total expense $132,194; net operating revenue (loss) $8,744; taxes $7,988; net operating income (loss) $16,732.

Results of the fare plans discussed are estimated by the commission's engineers as follows: (1) $19,737 increase; (2) $26,112 increase; (3) $15,463 increase; (4) $20,322 increase; (5) $10,355 increase; (6) $15,956 increase; (7) $20,334 increase; (8) $1,998 decrease; (9) $3,027 increase; (10) $6,383 increase; (11) $23,023 increase.

Rapid Transit in St. Louis Under Discussion

Mayor Victor J. Miller has made known that A. L. Shapleigh, president of the St. Louis Public Service Company, St. Louis, Mo., has asked for a conference to be held shortly after New Year's on the so-called "service-at-cost" ordinance. The company hopes to obtain a 30-year grant on that basis.

Many opinions are being expressed on rapid transit plans for St. Louis. When reporters queried Mayor Miller on rapid transit, he replied that "plans for rapid transit are included in the service-at-cost ordinance for the St. Louis Public Service Company." C. E. Smith, retiring city consulting engineer, said at a recent dinner in his honor that rapid transit was one of the things the city needs most.

Franchise Extension in Chicago

A 30-day extension of the Chicago surface lines franchises was granted by the Chicago City Council on Dec. 28. Under the terms of the last extension the franchises would have expired on Dec. 31. Mayor William Hale Thompson and Governor Small were to confer on Dec. 30 on the inclusion of subway and railway legislation in the special session call to be issued by the Governor early in January.

More One-Man Cars in Atlanta

That one-man cars will be used wherever the operation of such cars is possible was indicated on Dec. 3 when the first of a new series of one-man cars was introduced by the Georgia Power Company on the Inman Park line, the oldest street-car line in the city of Atlanta.

There are now about 150 one-man cars in operation in Atlanta. In this connection company officials point out that the savings made by the use of the cars have been invested 50 per cent in increased service to the public, 25 per cent in increased trainmen's wages and 25 per cent in added income for the company. Company records, it was said, show an increase in patronage for the one-man car lines, indicating that they are well liked by the public.

Advertising the Liberty Bell Route in Pennsylvania

Two advertisements high in contrast but clever have been effective in creating interest for the Lehigh Valley Transit Company, operating in Allentown and points throughout southeastern Pennsylvania. They are features of an active, attractive campaign of advertising which the company has taken up with good effect in the newspapers throughout the territory it serves.

The Lehigh Valley Transit Company operates an electric line, with splendid parlor cars, to Philadelphia, at lower rates and more comfortable traveling, than the railroads. Receipts from the line are a big item in the yearly financial scheme and use of the road must be constantly pushed.

At that season of the year, when all of eastern Pennsylvania was observing the 150th anniversary of the carrying of the Liberty Bell from beleaguered Philadelphia to Allentown for hiding, the advertising force of the organization was producing clever copy with a historical basis.

The route to Philadelphia was named the Liberty Bell route in the very beginning. Recently, however, it was learned that the route very closely follows that of Frederick Leiser and John Jacob Mickley, who hauled the revered bell in their oxcart over the rough roads of that period to its hiding place beneath Zion Reformed Church in Allentown.

An advertisement is headed by a line drawing showing the fine trolleys of the route, with the old oxcart, bearing the Liberty Bell, just beside it. A map shows the conformity of the two routes, the one in the Revolutionary days and the other in the present.

From a humanitarian, as well as a business standpoint, the railway has taken cognizance of the very dangerous present to attract attention in another of its advertisements.

Every conceivable effort is being directed toward the elimination of accidents on the company's lines. They are costly in the extreme. Injury to human life means claims. Smashups mean property damages. Accidents often bring unjust condemnation.

The company took into consideration the recent opening of the Allentown schools. More than 16,000 children from the ages of six to eighteen left upon their journeys to school — journeys which were to be repeated almost daily. They crossed streets and tracks.

Consequently, the advertising forces devoted one large newspaper insertion to a timely co-operative message. They urged that teachers instill the safety idea into the children. They even offered suggestions for the youngsters to protect themselves when forced to cross heavily traveled streets.

Its very unselfishness, and the fact that it was obviously no outright advertising for the company's benefit, made the copy highly attractive. At the same time it effectively carried the idea that children could ride to schools in the trolleys in safety.

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Recent Bus Developments

Bus Feeder Service Is Popular With Chicagoans

Popularity of the feeder bus line established in Chicago, Ill., last fall by the Chicago Surface Lines from the end of the Diversey Avenue car line to Laramie Avenue is shown by figures which have just been revealed for October, the second complete month of operation. During that period the big Fageol "Twin Coaches" used in this service carried 125,349 passengers. Although the Illinois Commerce Commission provided for operation of the line only to Laramie Avenue, applications for the extension of the bus service as far as the western city limits have recently been filed by several local business associations.

The November traffic and net earnings report, for the entire system, issued Dec. 20, shows a decrease of 317,859 in revenue passengers carried as compared with the month of November last year. The November total of 131,253,211 is also 4,166,012 less than the figure for October of this year. Earnings for November were proportionately lower.

Bus Request Put Over in Jacksonville

The request by the Jacksonville Traction Company, Jacksonville, Fla., of the City Council for permission to operate buses in Murray Hill has been referred by that body to the public service committee of the Council. The letter of the company asking permission to operate the bus service stated that the company intended to comply with all laws of the city, and outlined a schedule and route, but it was the sense of the majority of the Council that an agreement between the city and the company should be drawn by the city attorney before a permit was granted.

Bus Extension in Westfield Planned

Extension of its bus line in Westfield, Mass., is planned by the Springfield Street Railway, Springfield, Mass. This change will accommodate patrons not served under the present system of transportation. The State Department of Public Works and the City Council of Westfield have approved the expansion of bus service, but the Public Utilities Commission has taken the matter under advisement.

Buses the Talk of the Hour in Kansas City

Bus lines in Kansas City, Mo., their possible extensions, alterations of routes, and the question of additional equipment, is now being discussed by the directors of the Kansas City Public Service Company. The entire bus question is a lively issue now, with various communities asking a liberal use of buses on suggested "feeder lines." At present the question in Kansas City has two angles —the argument that bus lines should be more extensively employed in extending service to communities lacking railway service and, on the other hand, the financial losses.

The present fares are 10 cents on all bus lines except the express line in the Country Club district, which operates at a fare of 25 cents per person. The deficit in bus operation in 1926 was $307,000, but operating economies have reduced the loss this year to about $160,000. A new arrangement covering tires is said to have saved $75,000.

Bills to Regulate Interstate Commerce

Matter expected to be taken up actively after hearing before commission on Feb. 10. Digest of provisions of measures

TWO bills to regulate interstate buses have been introduced in the federal House of Representatives, one by Mr. Dennison of Illinois and the other by Mr. Parker of New York. The legislative committee of the Bus Division of the A.A.A. and representatives of the National Automobile Chamber of Commerce are co-operating in an effort to determine what ammendments if any are needed to make the bills more equitable and practicable. It is understood, however, that the House committee on interstate and foreign commerce will take no action on any bill until the proposed report of the Interstate Commerce Commission on its interstate bus and truck hearing is presented.

Bill Follows A.A.A. Principles

H.R. 19, introduced by Representative Dennison of Illinois, called the Dennison bill, generally follows the original ideas and principles laid down by the legislative committee of the Motor Bus Division of the A.A.A., of which S. A. Markel is chairman. A similar bill has been introduced by Senator Watson of Indiana, chairman of the Senate interstate commerce committee.

H.R. 5640, introduced by Representative Parker of New York, is identical with the Cummins bill of 1925. This provides for the regulation of both buses and trucks engaged in interstate commerce. The bill provides that the certificates of convenience and necessity be granted by the members of the State Regulatory Commission, acting as federal agents, with the right of appeal by the applicant to the Interstate Commerce Commission in case of adverse decision.

The Dennison bill automatically grants certificates to carriers operating in good faith at the time of the United States Supreme Court decision in the so-called Buck case, namely, March 3, 1925. Services on the highways started since that time are required to prove the convenience and necessity of their operation.

Another important difference between the Parker and the Dennison bills is that the latter requires the carrier to render service commensurate with the demand, whereas the Parker bill grants certificates only to individual vehicles and requires additional certificates to either increase or decrease the number of vehicles in service. Furthermore, the Parker bill requires that in fixing rates consideration be given to the kind and character of service to be performed, the public necessity therefor and the effect of such tariffs and rates upon other transportation agencies, with the idea of averting as far as possible unreasonable competition with existing services furnished by other carriers, motor or rail. This provision is not included in the Dennison bill, the nearest approach being Section 6C, which states:

> In determining whether or not public convenience and necessity warrants the granting of a certificate, the board or commission hearing such application shall give reasonable consideration among other pertinent matters to the public convenience and necessity and the character of transportation proposed, to available transportation services, to the character of service to be rendered by the applicant, and to the likelihood of proposed service being adequate, permanent and continuous.

Matter in Hands of Committees

At a meeting of the legislative committee of the Bus Division held in Washington on Dec. 2 to discuss the matter of interstate regulation a drafting committee was appointed to urge Representative Dennison and Senator Watson to introduce the bills mentioned in order to get the matter before the committees on interstate and foreign commerce. The whole matter of the regulation of the interstate bus and truck carriers is to be still further considered by a sub-committee consisting of S. A. Markel, George P. McCallum and E. W. Wakelee, who will draft any substitute provisions that might be required. Lorne Brown, representing the National Automobile Chamber of Commerce, will work with this subcommittee in a study of the need for amending the bill before hearings are held by the House interstate committee.

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I.C.C. Argument Put Over Until Feb. 10

The Interstate Commerce Commission has announced that the argument in the Motor Bus and Motor Truck Docket has been reassigned from Jan. 16 to Feb. 10. Frequent reference to the comparative youthfulness of the bus and truck industry is made by various parties in the pages of this docket, and this fact is used as a plea that regulatory legislation for interstate traffic be postponed until conditions have become more stable. Regarding this contention, Commissioner Esch makes the observation:

I have in mind the thought that, had Congress regulated traffic by rail carrier years ago, much of the time and labor of the Interstate Commerce Commission might have been avoided, and many actions now brought to us for consideration might have been obviated.

For the purpose of bringing out the facts in this case, briefs were submitted on the behalf of the Erie Railway, the New York, New Haven & Hartford Railroad, the American Electric Railway Association, the Oregon State Highway Commission, the Association of Railway Executives, the Motor Coach Association of the State of Washington, and the Department of Public Works of the State of Washington.

The American Electric Railway Association brief, prepared by the late Charles L. Henry, general counsel, reviews the history of interstate commerce regulation and observes that beyond a doubt Congress intended in passing the regulatory act, to control all carriers. This brief goes on to show that many electric railways have supplemented their rail service by the operation of buses and, in doing this, have invariably sought authority from the states or municipalities. Such bus operation, it is contended, is frequently subject to competition from other bus lines pretending to be engaged in interstate business and are thus able to operate where they will.

Alfred P. Thom, general counsel of the Association of Railway Executives, prepared the brief submitted by that organization. His primary purpose is to dispel the idea that the desire to regulate interstate bus and truck traffic had its origin with the steam carriers.

The Motor Coach Association of the State of Washington believes that regulation of interstate bus and truck traffic is impracticable at this time, but expressed the opinion that such regulation, when necessary, can be more expeditiously administered by the state than by Congress.

A New Terminal for Buses in Springfield

A bus terminal has been established by the Springfield Street Railway, Springfield, Mass., at the Worthington Street terminal for all out-of-town buses. Previously the location of the Springfield terminal for these buses was at Court Street and permission was obtained from the transportation board to make the change. In anticipation of increased congestion at Worthington Street the company has secured an option on adjoining property which it plans to exercise. An addition to the building is planned.

To co-operate with the Springfield company a modification of the routing of buses of the New England Transportation Company is in prospect. This would be advantageous to bus patrons in making connections.

Claim of Prior Rights Disallowed

Commission holds a highly competitive service would be created if it sustained applicant's plea

THE Public Service Commission of Pennsylvania has restrained the City Transfer Company from operating motor vehicles on a schedule over fixed routes in Harrisburg until it obtains a certificate of approval.

The City Transfer Company was chartered on Jan. 6, 1904, for the purpose of "transferring persons and property to and from the railroad stations, from railroad station to railroad station, and to and from points in the city of Harrisburg and vicinity by means of coaches, cabs, carriages, wagons, horse power or automobiles or conveyances of similar character."

The company claimed that since it was chartered prior to Jan. 1, 1914, before the commission was organized, it did not need the commission's approval for its proposed scheduled service.

Upon the announcement of the company of its proposed plan to operate buses to various parts of the city, complaint against the proposed service was filed by the city and the Harrisburg Railways in the Dauphin County Court and a preliminary injunction was issued by the court.

By agreement of the parties the injunction was continued until the matter could be submitted to the Public Service Commission and determined by that body.

After declaring that a highly competitive service would be created if the commission sustained the transfer company's contention, the order said:

We are of the opinion that under our organic law, the interpretations of it by the court, and the administrative discretion which is lodged with the commission, there is authority for a duty resting upon us to sustain the complaints.

The route which the company proposed to establish and operate with 29-passenger capacity buses on a 10-cent fare was from Market Square to the John Harris High School. The major portion of the proposed route is now served by the Harrisburg Railways, which extended its lines to the High School in 1926.

A portion of the report of the commission says:

The City Transfer Company has never since its incorporation furnished any transportation service on a regular schedule between fixed terminals of the kind and character it proposes to inaugurate. The only service furnished by the company, prior to Jan. 1, 1914, in any way similar to scheduled service was the use for a short time, after its incorporation, of a horse drawn bus which in going to and from the railroad station made stops at three hotels to take on passengers to outgoing trains or deliver incoming passengers to these hotels, all located within a few city blocks of the railroad station.

As just indicated, the City Transfer Company attempted first to operate a route of buses on the theory that its state charter, being issued in 1904, did not bring it under the jurisdiction of the city or the commission. The city instituted injunction proceedings against the transfer company and the railway joined with the city. The transfer company, the city authorities and the railway appeared before the commission at a series of hearings.

This is believed to be the first time in the State of Pennsylvania that a transfer or taxicab company under charter from the state antedating the creation of the Public Service Commission has claimed that it could operate as a public utility without being under the jurisdiction of the state commission and obtaining a certificate of public necessity. If the commission had ruled otherwise than as it did, any other taxicab or transfer company in any city in the State could then have operated as a public utility without being under the jurisdiction of the Public Service Commission.

Partial Bus Substitution in Oakland Sought

The Key System Transit Company has applied to the California Railroad Commission for permission to discontinue railway service over its Rockridge line in the city of Oakland and to substitute bus service for a period of 90 days. It is proposed to operate on a twenty-minute headway.

Buses Out of Omaha Shorten Run

The Nebraska State Railway Commission has authorized the private persons now operating the buses once owned by the Omaha & Lincoln Light & Railway Company, a McKinley corporation, to curtail the length of their runs so far as the city of Omaha is concerned. The railway ran cars to Papillion and Ralston, but these proved to be losing propositions, and it was allowed to substitute buses. These were disposed of when the company was absorbed by a consolidation of power companies. The bus men said that they would have to cut out Papillion service if they had to duplicate the railway service from South Omaha to Omaha proper, and after a hearing and consultation with patrons served the schedule was rearranged to provide for a northern terminus at 24th and N Streets, Omaha.

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Financial and Corporate

$2,650,000 Purchase of Central California Traction

The new agreement approved by the Interstate Commerce Commission under which the Southern Pacific, Western Pacific and the Santa Fe Railroads are to acquire joint control of the Central California Traction Company, operating an electric railway between Stockton and Sacramento, calls for the Fleishhacker interests to sell to the Southern Pacific, as of Dec. 31, 1927, all the outstanding stock and bonds of the electric railway for $2,650,000 in cash.

The Fleishhackers are to guarantee that the electric railway will have no indebtedness of any kind, except the principal amount of outstanding bonds and a proportionate amount of property-tax liability. If less than all the bonds are delivered by the seller, the agreed purchase price is to be reduced by the par value of any bonds of the carrier remaining outstanding in other hands.

The Fleishhackers further agree that within two years, at their own expense, they will remedy any defects or encumbrances affecting lands and rights of way of the electric railway, providing they are notified by the Southern Pacific by June 30 of next year. The ruling of the commission says:

Prior to the transfer of the stock and delivery of the bonds, the carrier (electric railway), in consideration of the guarantee personally assumed by the seller, is to convey to Fleishhacker the title to all its electric railway properties in the city of Stockton (a street car line operated under lease by the Stockton Electric Railway, which is a subsidiary of the Southern Pacific), with certain exceptions and reservations, and Fleishhacker, in turn, is to sell such properties to the Stockton Electric Railroad in consideration of the delivery to him of $100,000 of Pacific Electric Railway first refunding mortgage bonds.

The Southern Pacific agrees that immediately upon the acquisition of the carrier's stock and bonds, it will admit the Western Pacific and the Santa Fe to participation equally with the Southern Pacific upon payment by each of those carriers of one-third of $2,650,000 or such lesser sum as shall represent the purchase price of the securities.

Brief reference to this proposed purchase was made in the ELECTRIC RAILWAY JOURNAL in the issue of Dec. 10, page 1083.

$29,000,000 of Central Illinois Mortgage Bonds

Refunding operations of the Central Illinois Public Service Company, Springfield, Ill., in which the retirement of practically all of its higher rate issues and underlying bonds is contemplated, were brought to light recently with the announcement of an offer by Halsey Stuart & Company, Chicago, of an issue of $29,000,000 of the utility's 4½ per cent first mortgage bonds, series F. The bonds to be retired include three issues of first mortgage and refunding bonds in the principal amount of $16,450,000, with interest coupons ranging from 5½ to 6½ per cent and seven underlying issues amounting to $11,101,500. The proceeds of the new bonds will be used to reimburse the company's treasury for additions and extension to property as well as for the retirement of the higher interest bearing securities.

The present financing, it is pointed out, will result in a substantial saving in interest charges, simplification of the company's financial structure and an improvement in the mortgage position of the company's bonds.

Payment Date Postponed in O'Fallon Case

The Interstate Commerce Commission has postponed from Feb. 15 until April 30 the effective date of its order requiring the St. Louis & O'Fallon Railway to pay the government $226,000 of excess earnings. This action is taken to permit the carrier to appeal to the Supreme Court from a recent decision of the federal court in Missouri upholding the order of the commission.

Position of Third Avenue on Income Bond Interest Upheld

Judge John Knox in the U. S. District Court at New York has rendered a decision in favor of the Third Avenue Railway, New York, in an action brought by Thomas B. Jenkins and other holders of the adjustment 5 per cent bonds to have an injunction issued against the company restraining it from using its funds to promote bus service and requiring it to pay full 5 per cent interest and arrears on these bonds.

Judge Knox said in part:

The company, being confronted with peculiarities of transit conditions as they exist in this municipality, has been put to the necessity of acquiring control, through a subsidiary, of certain bus routes, which, if they come into possession of competing concerns, would have intefered seriously with earning capacity of the defendants.

In the main, the bus routes are closed by the defendants' lines of transportation, and in the hands of an antagonistic company the routes would be sharply competitive. To forestall this menace, I am of the opinion that the defendants' position in the premises is justified.

The accounting for which the plaintiff prays may show facts which will entitle him to some relief, but upon the present disclosure I am not satisfied that he should have injunction relief which is now sought.

The position of the company in the matter has been the subject of extended comment previously in the JOURNAL.

Operation to Cease in Albuquerque

The City Electric Company, Albuquerque, N. Mex., will discontinue operation on Jan. 1. About six months ago the company was placed in the hands of a receiver and the property was ordered sold for liens totaling approximately $59,000. Applications have been made for operation of buses in Albuquerque after Jan. 1, 1928.

With the cessation of railway service will pass the era of the motorettes, who have been operating the cars in that city since the days of the World War. The receiver has asked the business men to assist in obtaining work for the women who have been operating the cars.

Change in Name of Pennsylvania Company

The name of the Penn Public Service Corporation, a unit of the Associated Gas & Electric System, has been changed to the Pennsylvania Electric Company. This change in name is the only change, no merger or consolidation being contemplated. The Penn Public Service Corporation supplies railway service to the various boroughs and townships along the railway line from Philipsburg to Winburne, Pa., and also in the Borough of Du Bois.

North Shore Certificates Offered

A new issue of $720,000 par value equipment trust certificates of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., bearing interest at 5½ per cent was offered Dec. 13 by Halsey, Stuart & Company, Chicago. The issue is being sold at prices to yield from 5.25 to 5.50 per cent, according to the maturities, which range from Dec. 1, 1933 to Dec. 1, 1942, inclusive. The creation of these certificates has been authorized by the Illinois Commerce Commission and the Railroad Commission of Wisconsin.

No Par Stock for Public Service, New Jersey, Approved

Issuance by the Public Service Railway, Newark, N. J., of 12,500 shares of stock without par value was approved on Dec. 24 by the Public Utility Commission.

The only witness at the hearing on the petition was Edward A. Tuson, general auditor of the transportation companies of Public Service, who stated that the commission in 1917 had approved the issuance of 12,500 shares of common stock of a par value of $100 each; that the company had never issued that stock and that it now wished to issue the no par stock instead, as its common stock now is of no par value.

The stock of the Public Service Railway is owned by the Public Service Corporation of New Jersey.

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Offer Made for Saskatoon Municipal Properties

An offer to pay $3,500,000 for the power and distribution plant and the railway at Saskatoon, Sask., and to divide the net profits from their operation with the city has been made by the Dominion Electric Light & Power Company, New York.

Bence, Stevenson & McLorg, acting in behalf of the intending purchasers, have written to the City Commissioner as follows:

We have just received instructions from the Dominion Electric Light & Power Company, Inc., to ask if the city would consider favorably an offer to purchase the power plant, poles, wires, and all equipment accessory and incidental to the manufacture and distribution of light and power to the city of Saskatoon, together with the railway, which, of course, is inclusive of all equipment and property used in connection therewith, at and for the sum of $3,500,000 cash.

If an agreement is arrived at our clients are prepared to spend the further sum of $1,500,000 on development of electric power and light.

In making the above inquiries our clients have in mind that the present rates for power and light remain, that the usual depreciation continue and that a sinking fund therefore be provided out of earnings.

An interest rate on the money invested is to be allowed and the rate to be agreed upon by both parties. Our clients will pay taxes.

Net profits, after providing for the above, are to be divided equally between the city and our clients.

With further reference to the rates as stated above, the present rates would be maintained subject, of course, to mutual agreement otherwise.

A franchise that would satisfy the legal requirements would be required.

New Issues for Stark Electric Approved by Commission

A $500,000 first mortgage 7 per cent bond issue of the Stark Electric Railroad, Alliance, Ohio, to be sold at 90 and the issuance of $250,000 of preferred stock to finance the retirement of a twenty-year $730,000 mortgage and outstanding notes have been approved by the Public Utilities Commission. That body has also amended an order of Nov. 16 concerning the sale of electrical equipment by the Stark Electric to the Alliance Power Company. The amendment authorizes the power company to purchase an easement right-of-way from Louisville to Damascus, Ohio, a distance of about 16 miles, for $22,500.

Approval of Massachusetts Interurban Stock Issues

New capital stock issues by the Boston, Worcester & New York Street Railway have been approved by the Massachusetts Department of Public Utilities. The company has secured approval of an issue of 7 per cent prior preferred stock for $10,000 in $100 shares, and an issue of 6 per cent preferred stock for $756,000 in $100 shares in lieu of $766,000 of outstanding common capital stock. The names, preferences, rights, restrictions, limitations and rates determined by the stockholders on Dec. 3, as applicable to the new stock, are approved. The company succeeded the Boston & Worcester Street Railway.

Scope of Securities Association Widened

Primary purpose of national association is to provide for collective action to improve credit of issuing corporations. Objectives of body will now embrace public utility securities

IN ORDER that the 70,000,000 citizens whose interests are involved may have a voice in the activities of the new Congress toward railroads and public utilities, the National Association of Owners of Railroad Securities laid down recently a program for the expansion of its functions. It will for the first time provide a means through which these actual owners may help guide the destinies of their properties.

At a meeting at the Bowery Savings Bank, some 50 of the members of the advisory and executive committees of the association voted to change its name to "National Association of Owners of Railroad and Public Utility Securities" so as to provide a more comprehensive understanding of the original purpose of the association, when it was established in 1917.

The meeting was called by Milton W. Harrison, president of the association and a trustee of the Bowery Savings Bank. Policies enunciated on Nov. 29 as determining the purposes of the association will go far, it is believed, toward helping Congress in respect to its responsibilities in matters relating to railroad and public utility industries.

Outstanding among the purposes of the association are the following:

1. To provide a method for collective action by owners of railroad and other securities for the purpose of maintaining and improving the credit of the corporations issuing them.

2. To protect and assist in steps for stabilizing the securities issued by railroads and other public utilities of the United States.

3. To organize, promote and carry out, in the public interest, a campaign of education, that the public may be informed of the extent to which all citizens are directly interested in the welfare of public utilities and railroads, and in the securities issued by them. Also to point the necessity for collective action to protect investments made in railroad, public utility, and other securities, in order that the credit of such corporations may be maintained, resulting in a better and more economical service to the people.

Milton W. Harrison was re-elected president of the association. Henry Bruere, New York, was appointed treasurer, and the following were elected district vice-presidents: Darwin P. Kingsley, president New York Life Insurance Company; T. K. Glenn, president Trust Company of Georgia, Atlanta; M. A. Traylor, president First Trust & Savings Bank, Chicago; I. H. Kempner, president United States National Bank, Galveston, Tex., and George I. Cochrane, president Pacific Mutual Life Insurance Company, Los Angeles.

General offices of the association will be maintained at 11 East 36th Street, New York. The present membership of the association will be extended to include such further individual and institutional owners of railway and public utility securities as may care to avail themselves of the association's advantages.

In outlining the scope and purpose of the work in hand, President Harrison said:

Changing the name of the association, with objectives that embrace public utility securities as well, effectively carries out the reason for the establishment of the national association in 1917. Since that date holders of railroad securities have become extensive investors in public utilities.

At present Congress and the commissions undertake to represent the investors without the help of the investors themselves. It becomes, therefore, an obligation of nation-wide importance that investors effectively put themselves in a position not only to be of constructive assistance to Congress and to regulatory commissions but to protect and stabilize the securities they own. Unwise legislation and regulation can do much damage to the soundness of security values because the industries behind such securities are under government control.

This association is in the happy position of desiring only the application of sound economic principles. Our interests are wholly parallel with those of legislatures, courts and regulatory bodies. No organization is so favorably positioned as ours to perform constructive service. The identity of our interest with that of the public interest will be apparent to all. But let this be clearly understood, our views will carry no weight unless we enunciate them.

With regard to railroads, of great importance to our interest is the question of primary valuations. The I. C. C. methods have been earnestly protested by parties at issue and with the greatest divergence of opinion. Several attempts have been made by protestants to secure review by the Supreme Court but such petitions have been dismissed pending the time the commission seeks to make practical application of its valuation findings. Such court review will probably be had in the early months of 1928. It is of great importance to us that valuation principles and procedure are still in a formative state and are susceptible of being molded by Congress and by courts along lines radically different from those adopted by the commission.

There are almost daily before the Interstate Commerce Commission finance dockets involving the issuance or retirement of security issues with which we are most directly concerned. There are pronounced

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indications that the commission is slowly evolving a policy on financial structures which will in the future be controlling upon it. We should certainly know how our interests are affected in these cases and be in a position effectively to intervene when necessary. The relation between valuation for rate making and for taxation should be more earnestly studied and we should, I believe, participate constructively to inform the public on this and similar matters.

Tax Assessment of Capital Stock Reduced in Chicago

Holding that the tax assessment on capital stock of the Chicago Surface Lines, Chicago, Ill., made by the Illinois Tax Commission "amounted to virtual confiscation," Judge Victor P. Arnold of the Circuit Court has reduced the amount from $2,192,145 to $1,181,547. In a decision handed down Dec. 19, the court stated that the commission evidently ignored its own rules by not reviewing available evidence concerning actual value of the stock. The suit was of importance because it involved the question of how far the State Tax Commission can go in assessing taxes on the capital stock of corporations. The decision sustains the contention of the Chicago Surface Lines in every respect. The tax as fixed by the State Tax Commission and as fixed by the court as fair is as follows:

Company	State Tax Commission	Circuit Court
Chicago Railways	$798,150	$494,099
Calumet & South Chicago*	629,690	262,335
Chicago City Railway	764,304	425,113
Totals	$2,192,145	$1,181,547

* The amounts are for the years 1925 and 1926, except in the case of the Calumet & South Chicago to which the year 1924 is added.

Partial Abandonments in Auburn

The Public Service Commission approved a declaration of abandonment by the Empire State Railroad Corporation on Dec. 5 of what is known as the Clark Street line in Auburn and the West Genesee Street tracks. It was decided that the lines were no longer necessary for the public use. The fact was brought out at the hearing before the commission that the Empire company, now in the hands of a receiver, owed Auburn for paving taxes $12,173.

Mitten Building Purchased

The Mitten Bank Securities Corporation recently purchased from Mitten Management the Mitten Building, located at the northwest corner of Broad and Locust Streets, Philadelphia. The purchase price was $6,000,000, the same amount paid by Mitten Management when it bought the property. This building, with twenty floors, is one of the newest and most modern office structures in the central district. The first thirteen floors are occupied for the most part by Mitten Management and the offices of the Philadelphia Rapid Transit, while the Mitten tours motor-bus terminal is located on the ground floor.

Personal Items

Omaha Welcomes Mr. Shannahan

New president is guest of honor at luncheon. Newspaper comment favorable and helpful in tone

JOHN N. SHANNAHAN, new president of the Omaha & Council Bluffs Street Railway, Omaha, Neb., was guest of honor on Dec. 19 at a luncheon by J. E. Davidson at the Fontenelle, Omaha. One hundred and fifty business men attended. He said in part:

To come to a city where I know almost no one and get a welcome like this makes my job look much easier than it did ten days ago, he began. I have never lived away from the Atlantic seaboard, and my friends told me they wondered why I came to Omaha. The reason the invitation appealed to me so strongly is this: The electric railway business of the country is in a particularly critical state at this time. If I can work out the situation satisfactorily here, give Omaha a transportation system it should have and put the company on a dividend basis—not only in dollars and cents but in good will and friendship—then possibly I will show my brothers in the industry the way out of their difficulties.

Realizes Difficulties of Job Ahead of Him

And this cannot be done without your assistance. I am conscious I have undertaken a difficult job. A railway is the servant of the public, and I regard myself as much of a servant as your mayor or the policeman on your streets. My aim is to make Omaha's railway an asset to the city. A dilapidated, "run down at the heel" railway system is the poorest advertisement a city can have. I want your suggestions, and the door of my office will always be open. If you think you can be of assistance, pay me a call.

Under the title "Welcome, Mr. Shannahan, the Omaha *World-Herald* of Dec. 20 said in part:

Mr. Shannahan has come to serve as president of the railway at a very troublesome and critical time in the history of that corporation. He comes with a shining record of success as a doctor of sick public utilities, due in part, it is said, to his technical competence and broad understanding of such problems, and in other part to an exceptional gift for winning public confidence and support by deserving to win it.

Newspapers Favorably Disposed

The *World-Herald* hopes that the new president may prove all that he is cracked up to be, and that he may achieve another notable success by putting the company back on its feet and by establishing a genuine entente cordiale between it and its patrons, the people of Omaha. And we should not be at all surprised if he does it, difficult though the task appears. For Mr. Shannahan impresses the stranger as a candid, fair-minded and straightforward man, at once earnest and tactful.

An executive such as he should need to go not much more than half-way to find that the most of his troubles are little ones, after all. For Omaha has no war to wage on the railway. Omaha wants to see it a successful and well-managed corporation, and is cheerfully willing that it should earn a fair profit on honest and prudent investment. At once for the company's good and for the city's good it is to be hoped that as much can be done for the railway as for other public service corporations. The *World-Herald* welcomes John Shannahan to Omaha not only as a railway executive but as a citizen, and hopes that his days among us may be long and pleasant and freighted with usefulness.

Clark V. Wood, Jr., Official of New England Transportation

Clark V. Wood, Jr., has been appointed assistant supervisor of the Connecticut lines of the New England Transportation Company, subsidiary of the New York, New Haven & Hartford Railroad. He has in the past been connected with the Springfield Street Railway and the United Electric Railways, Providence.

L. E. Lynde Transportation Division Manager at Boston

L. E. Lynde has been appointed manager of the transportation division of the Boston office of the Westinghouse Electric & Manufacturing Company. Mr. Lynde has been with the Westinghouse company since 1920, and during the past several years has been located in its New York office, where he was engaged in transportation activities.

Mr. Lynde was born in Dover, N. H. He was reared there and was graduated from the University of New Hampshire. He is a member of the New York Railroad Club, American Electric Railway Association and Theta Chi fraternity.

During the war Mr. Lynde served overseas as an officer with the A. E. F.

Mr. Lynde succeeds H. S. Day, who recently resigned to become superintendent of equipment for the United Electric Railways, Providence.

Joe R. Ong Studies Winnipeg System

Joe R. Ong, transportation engineer of the Cincinnati Street Railway, Cincinnati, Ohio, has just returned to Cincinnati from Winnipeg, Manitoba, where he has been engaged for several weeks as consultant on matters relating to the railway utility of the Winnipeg Electric Company.

Mr. Ong became connected with the Cincinnati Street Railway in February, 1926, shortly after its reorganization and is in charge of transportation engineering matters and the traffic studies

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that are proceeding along with the rehabilitation of the property. He has been serving the Winnipeg company on a special leave of absence from the Cincinnati system.

Other railway properties with which Mr. Ong has been identified as transportation engineer or as consultant include the Georgia Power Company, Atlanta; the Kansas City Public Service Company, Kansas City, Mo.; the Los Angeles Railway and the Northern Ohio Power & Light Company, Akron. He was formerly electric railway engineer on the staff that served jointly the Railroad Commission of Wisconsin and the Wisconsin Tax Commission and conducted service studies and appraisals on many of the Wisconsin properties including the Milwaukee Electric Railway & Light Company.

W. Nelson Smith with Engineers

W. Nelson Smith, connected with the Winnipeg Electric Company, Winnipeg, Man., for some years and more recently assisting several prominent engineering firms on heavy electric traction projects, has become connected with the organization of the E. L. Phillipps & Company, engineers, 50 Church Street, New York, N. Y. Mr. Smith returned to Winnipeg in 1925 after an absence of about a year in Vancouver, where he assisted Sydney E. Junkins & Company, Ltd., in preparing a report on the electrification of the Canadian Pacific Railway. After his return he was engaged for a time in the valuation of the light and power distribution systems of the Winnipeg Electric Company. Mr. Smith's experience in steam railway electrification work covers a period of more than twenty years. After designing a number of interurban railway systems, he took a leading part in the laying out of the electrification of the Erie Railroad at Rochester, N. Y., and the Long Island Railroad.

Edison Medal Awarded to William D. Coolidge

The Edison Medal has been awarded by the Edison medal committee of the American Institute of Electrical Engineers to Dr. William D. Coolidge, "for his contributions to the incandescent electric lighting and the X-Ray arts."

The Edison Medal was founded by associates and friends of Thomas A. Edison, and is awarded annually for "meritorious achievement in electrical science, electrical engineering, or the electrical arts," by a committee consisting of 24 members of the American Institute of Electrical Engineers.

The medal has in the past been awarded to Elihu Thomson, Frank J. Sprague, George Westinghouse, William Stanley, Charles F. Brush, Alexander Graham Bell, Nikola Tesla, John J. Carty, Benjamin G. Lamme, W. L. R. Emmet, Michael I. Pupin, Cummings C. Chesney, Robert A. Millikan, John W. Lieb, John White Howell, Harris J. Ryan.

Dr. Coolidge is assistant director of the research laboratory in the General Electric Company, physical chemist.

OBITUARY

B. C. Edgar

Official of Tennessee utilities an executive of wide experience. Firm believer in value of good public relations

B. C. EDGAR, vice-president and general manager Tennessee Electric Power Company and president of the Nashville Railway & Light Company, died on Dec. 26 at his home on Lookout Mountain, Chattanooga, Tenn. Mr. Edgar, for many years prominent in the utility field for the important posts he filled so acceptably, had been ill for a long time.

Mr. Edgar was always a firm believer

B. C. Edgar

in the policy of maintaining good public relations and meriting the confidence of the utility's customers, and in giving complete publicity to the affairs of his companies through the daily newspapers and the weekly press of Tennessee. Under his guidance the local utility became one of the leading public service organizations of its kind, not only in the South, but throughout the nation, furnishing electric light and power service for more than 100 communities in Middle and East Tennessee.

He always took an active interest in the affairs of the electric light and power industry. In 1926-1927 Mr. Edgar served as president of the National Electric Light Association, southeastern division, comprising light and power companies and those identified or affiliated with the electrical industry in the states of North and South Carolina, Georgia, Florida, Alabama and Tennessee. He presided at the last convention of the association held in Memphis in April of this year.

Mr. Edgar was first employed by the Manhattan Railway, New York City, in changing from steam-driven trains to electrical operation. Later he became identified with the electrification of the tubes under the Hudson River at New York City.

From 1909 to 1912 he was in San Francisco and in Portland, Ore., with the Southern Pacific System. Among his task was one connected with the electrification of suburban railway lines from Oakland to Berkeley, Cal. From 1912 to June, 1914, Mr. Edgar was assistant general superintendent of the Columbus Railway, Power & Light Company, Columbus, Ohio. He was made general superintendent of the Nashville company in the latter year, and in February, 1919, he was elected to the vice-presidency of the Chattanooga Railway & Light Company, the Nashville Railway & Light Company and the Tennessee Power Company. When the Chattanooga Railway & Light Company and the Tennessee Power were merged in February, 1923, with the Chattanooga & Tennessee River Power Company into the Tennessee Electric Power Company Mr. Edgar was continued as vice-president and general manager of the merged company. In December, 1925, he became president of the Nashville company. Under his administration the Tennessee companies have grown greatly.

Mr. Edgar was born in Rahway, N. J., in 1878. In his early boyhood he became interested in the rapidly developing science of electricity. He was graduated in electrical engineering from Rutgers College, New Brunswick, N. J., in 1900.

WILLIAM G. MATTHEWS, superintendent of way and buildings of the Denver Tramway, Denver, Col., died Dec. 3. Mr. Matthews joined the tramway in 1891. At that time the system was run by cable. He worked in various departments up to 1920, when he was appointed maintenance superintendent, the position he filled up to the time of his death.

JOSEPH HORACE GOODSPEED, at one time affiliated with the West End Street Railway, the predecessor of the Boston Elevated Railway, Boston, Mass., died on Dec. 11.

J. PHILIP PHINIZY, a director of the Georgia Power Company, Atlanta, Ga., died recently at his residence in Athens. He was president of the Southern Manufacturing Company and president of the Southern Life Insurance Company. Mr. Phinizy was 66 years old. He was an alumnus of the University of Georgia.

CHARLES D. STANFORD, Maine capitalist, instrumental in the promotion of the electric railway in Bangor, Me., died Nov. 8 in Bangor. Years ago he foresaw the advantages of the electric railway and was one of the promoters of the Bangor Street Railway. He was also connected officially with the power developments of the Bangor Hydro-Electric Company, which controls most of the power developments and railways in that section. Mr. Stanford was 81 years old.

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Manufactures and the Markets

Ten New Cars for New York, Westchester & Boston Railway

Ten electric passenger cars are being ordered by the New York, Westchester & Boston Railway, New York, N. Y.

The car bodies and trucks will be Osgood-Bradley, electrical equipment Westinghouse Electric & Manufacturing Company and air brakes Westinghouse Air Brake Company.

The units, it is understood, will be similar in design to the twenty cars previously ordered and mentioned in the JOURNAL for Aug. 21, 1926. The latter have an overall length of 72 ft. 7¼ in. and seat 80 passengers.

The new cars will be delivered in the spring and will be used on the extension under construction between Harrison and Rye, N. Y.

Westinghouse Veteran Promoted

I. F. Baker has been promoted to manager of the Far Eastern department of the Westinghouse International Company. He comes to his new position from Japan, where he was managing director of the Westinghouse Electric Company of Japan, president of the American Merchants Association of Tokio, and acting president of the American Association of Tokio. His new offices will be in New York.

Mr. Baker is a veteran in the Westinghouse company. He entered the company as an apprentice in 1909, graduating into the industrial sales department, East Pittsburgh, in 1910; was transferred to the Westinghouse Electric Export Company at East Pittsburgh in 1913; was made commercial engineer in the Westinghouse Electric International Company of New York, in 1918, and sent to Tokio, Japan, as a manager for Japan in 1919. Six years later he was promoted to managing director of the Japan Company, which position he held until his recent transfer to New York.

New Viaduct to Eliminate Grade Crossing in East St. Louis

The grade crossing of the Terminal Railroad Association and the East St. Louis & Suburban Railway at 21st and State Streets, East St. Louis, Ill., it is reported will be eliminated by the construction of a reinforced concrete viaduct to carry the railroad tracks above State Street, which will be depressed from 6 to 8 ft. Detailed plans have not been prepared, but the project will cost about $300,000. The cost, it is understood, will be shared by the Terminal, the East St. Louis & Suburban and the city.

Originally it was planned to construct a similar viaduct to eliminate the Southern Railroad belt grade crossing two blocks away, but the special committee on grade crossing separation appointed by the East St. Louis Chamber of Commerce and the representatives of the railroads and city officials decided to compromise by constructing only the terminal viaduct at this time.

It is planned to depress State Street from 6 to 8 ft. and to elevate the terminal tracks about 10 ft. above the present level.

Big Motor Order Placed by London Underground

An order for twenty new steel motor motors, each of 240 hp., has been placed by the London Underground Railways with the General Electric Company. The order also includes equipment for 63 motor coaches and 107 trailer cars. Six hundred and twenty-eight coaches of the London Underground system have been similarly equipped by the same concern. The new order, according to reports, is the first part of the complete overhauling scheme recently initiated by the London Underground.

Twenty Motor and Trail Cars for Illinois Central

An order for twenty new steel motors and trailer passenger cars for use in its electrified Chicago suburban service was placed Dec. 24 with the Pullman Car & Manufacturing Corporation, Chicago, by the Illinois Central Railroad, Chicago, Ill. The new cars, seating 84 passengers each and all equipped with roller bearings, increase the company's electrically operated equipment to 280 units. Delivery of the cars, which are estimated to cost between $900,000 and $1,000,000, is promised for 1928.

Five Railways and Subsidiaries Receive Mack Buses

Deliveries of Mack buses to electric railways and their bus operating subsidiaries recently reported by the International Motor Company's bus department follow:

Utah Light & Traction Company, Salt Lake City, Utah, has received five Mack bus chassis, two 230-in. wheelbase and three 196-in. wheelbase.

Hamburg Railway, Hamburg, N. Y., operating an extension bus line from its city limits terminal into Buffalo, has received a Mack bus, a 25-passenger parlor car bus, 230-in. wheelbase, four-cylinder motor, for de luxe service.

Boston Elevated Railway, Boston, Mass., has accepted delivery on two Mack buses, city type, 29-passenger capacity, four-cylinder motors.

Connecticut Company, New Haven, Conn., has accepted delivery on five 29-passenger city type Mack buses, four-cylinder motor, 225-in. wheelbase.

Public Service Transportation Company, bus operating subsidiary of the Public Service Corporation of New Jersey, Newark, N. J., has received three Mack parlor car buses, 25-passenger capacity, 230-in. wheelbase, four-cylinder motor.

Expansion Program in Los Angeles Not Yet Determined

Not until the California Railroad Commission hands down its decision in the case affecting rates on the Los Angeles Railway, Los Angeles, Cal., will the company be in a position to determine in detail the program for expansion which it is understood to have in mind. The hearing in the rate case was held last May, but the commission has not yet acted upon the appeal made to it. The company is not now in a position to add any more cars of the so-called 2501 type, and it will, it is understood, continue with its present rolling stock equipment until such time as the commission has rendered its decision.

New Pension Plan Announced by General Electric

A contributory pension plan, whereby employees pay in a small part of their wages from year to year to a pension fund, supplementing the old age pension system which the General Electric Company has had in effect since 1912, has been announced by Gerard Swope, president of the company.

At the same time Mr. Swope announced the creation of a pension trust. Instead of the company carrying a reserve on its balance sheet sufficient to meet its obligation to employees reaching the retiring age, $5,000,000 has been turned over to the trustees of the new trust by the company.

Pensions at present are computed at 1½ per cent of the earnings of employees for each year of continuous service. Under contributory plan of additional pensions, which it is proposed to make effective Jan. 1, 1929, 1½ per cent of the annual earnings of the employees will be turned over to the custodians, a board of seven, on which the employees will have representation. This money will be invested and held for the employees individually. Interest will be allowed to accumulate.

The retiring age in the past has been 70 years for men. Under the new plan it is proposed to make this 65 years for men and, as at present, 60 years for women.

N.Y.R.T. Gets 600-Volt, 4,000-Kw. Converter

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently furnished to the New York Rapid Transit Company a 4,000-kw., 600-volt converter which is a dupli-

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cate of a machine already installed in the same station. The new machine is a 4,000-kw., 575-volt, direct-current, shunt-wound converter. It is supplied from a three-phase, 4,200-kva., 11,000-volt, 25-cycle power transformer. The equipment is operated by means of supervisory control from the New Utrecht station.

$2,578,296 for Kansas City Rehabilitation Program

The budget of $2,578,296 for completion of the rehabilitation program of 1928 of the Kansas City Public Service Company, Kansas City, Mo., has been submitted to Dr. Saunders, of the executive committee and his associate members, Powell C. Groner, president of the company, and Col. E. M. Stayton, city representative. It includes $1,018,180 for overhauling and rebuilding cars, $933,228 for new tracks, and $240,588 for special track work at intersections. The committee will report to the directors at a meeting to be held within a few days.

The franchise promised a rehabilitation program of $6,600,000 to be finished within three years. Last year under the regime of William G. Woolfolk as president, expenditures approximating $4,000,000 were authorized and for the most part completed.

Montreal Tramways and City Decide on Car Tunnel

The city of Montreal and the Montreal Tramways, according to reports, have decided to tunnel under the Lachine Canal on Wellington Street, the work to cost between $7,000,000 and $8,000,000. In a recent interview Julian Smith, president of the tramways company, stated that as a result of long-continued negotiation with the city an agreement had been arrived at between the city of Montreal and the tramway. The project has now been given the approval of the Tramways Commission, subject to the approval of the Dominion government and subject to contribution by the Dominion government toward the expense of the work of putting the tramway lines on Wellington Street and Verdun Avenue into tunnels beneath the canal and building new lines so that through cars could be operated from St. Catherine Street into Verdun and Pointe St. Charles.

With the construction of the tunnel under the canal on Wellington Street the Wellington Street service will be greatly improved and the long delays which have been due to the bridges will be eliminated, and a substantial gain in reducing delays to shipping will also result.

Negotiations are now taking place with the Dominion government looking to their approval, in principle, of this undertaking and to an agreement by which the government will bear its share of the expense. Advices are to the effect that it is hoped if the government comes to a prompt decision in this matter the work can be commenced on one of these undertakings and completed before the opening of navigation in 1928.

Exhibitograph No. 1

Good News

The 47th A. E. R. A. convention and exhibit are to be held in

Cleveland

Sept. 22-28, inclusive

Let your New Year resolution be to stage an exhibit at the next A. E. R. A. convention. That's the place to talk turkey.

Quiet and Steady Metal Markets

The customary and expected holiday quietness characterizes the metal markets for the week ended Dec. 28, and no change is expected until after New Year's Day. Prices, however, have been steady.

The large producing interests have continued to quote 14⅛ cents for domestic deliveries of copper in the East all week. A fair amount of business was done in the Middle West Dec. 23 at 14¼ cents, however. The custom smelters have in general quoted 14 cents delivered in Connecticut, since Dec. 22, when the last of the 13⅞ cents copper was absorbed. The price of the export association continues at 14.50 cents, c.i.f.

The leading interest in the Middle West quoted lead 6.325 cents all week, but business done at this figure was all but negligible, virtually all the sales by this company being on an "average" price basis. Other sellers did a fair business at 6.30 cents.

Some zinc has found a market at 5.625 cents in the week ended Dec. 28, but the price to consumers has generally ruled at 5.65 cents, St. Louis, for all deliveries. High-grade is neglected, with nominal quotations for spot carloads remaining at 7¾ cents delivered.

Tin prices are a little lower than they were a week ago. Straits suffered more than 99 per cent metal and the spread between the two today is only ⅛ cent. Compared with spot Straits, January and February are off about ⅛ cent, and March and April about ¼ cent.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York	Dec. 27, 1927
Copper, electrolytic, cents per lb.	13.80
Copper wire, cents per lb.	15.75–16.00
Lead, cents per lb.	6.50
Zinc, cents per lb.	6.00
Tin, Straits, cents per lb.	58.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....
Somerset mine run, Boston, net tons	.....
Pittsburgh mine run, Pittsburgh, net tons.	.....
Franklin, Ill., screenings, Chicago, net tons	1.60
Central, Ill., screenings, Chicago, net tons	1.50
Kansas screenings, Kansas City, net tons..	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.50
Weatherproof wire base, N.Y., cents per lb.	16.50
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N.Y., cents per lb.	13.25
Turpentine (bbl. lots), N.Y., per gal.	0.60

TRADE NOTES

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, announces the appointment of R. M. Plympton as salesman in charge of consumer motor business in Chicago. He will work under the direction of R. D. Malm, Chicago district manager. Mr. Plympton was formerly assistant sales manager for the Babson Statistical Association, Wellesley Hills, Mass.

MANNING, MAXWELL & MOORE, INC., New York, to co-ordinate the handling of its business, has organized two operating companies under the laws of Delaware, the Consolidated-Ashcroft-Hancock Company and the Shaw Crane-Putnam Machine Company. Manning, Maxwell & Moore, Inc., owns all the stock of both corporations. The Bridgeport and the Boston plants of Manning, Maxwell & Moore, Inc., and the sales force marketing the products of these plants will make up the Consolidated-Ashcroft-Hancock Company. The Shaw Crane-Putnam Machine Company takes over the Shaw Crane Works and the Putnam Machine Works and the sales activities pertaining to them. The supplies department and the Chicago machinery branch office of Manning, Maxwell & Moore, Inc., operate as formerly.

RAILWAY TRACK-WORK COMPANY, Philadelphia, Pa., has sold to the Tulsa Street Railway, Tulsa, Okla., a "Vulcan" rail grinder and a "Eureka" rail joint grinder.

OHIO BRASS COMPANY, Mansfield, Ohio, has published booklet No. 519, entitled "The Dirge of a Dime (Ten Cents)." It contains amusing illustrations and text.

TRUSCON LABORATORIES, Detroit, Mich., has issued a folder descriptive of its products for the protection of steel, concrete and masonry, and wood.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., has issued bulletin No. 153, loose-leaf, describing the Wagner split-phase induction motor, type 58RB, ½, ⅓ and ¼ hp.

SILENT HOIST WINCH & CRANE COMPANY, INC., Brooklyn, N. Y., has issued bulletin No. 30, descriptive of its different types of silent hoist motor truck and power winches.

SULLIVAN MACHINERY COMPANY, Chicago, has recently issued looseleaf bulletin 81-O and 81-Q, descriptive of its auger rotators, class "H-8," and "rotator" rock drills, "L-5" medium, "L-3" heavy model. Both of the bulletins are illustrated.

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ELECTRIC RAILWAY JOURNAL

aw-Hill Publishing Company, Inc. DECEMBER 31, 1927 Twenty Cents per Copy

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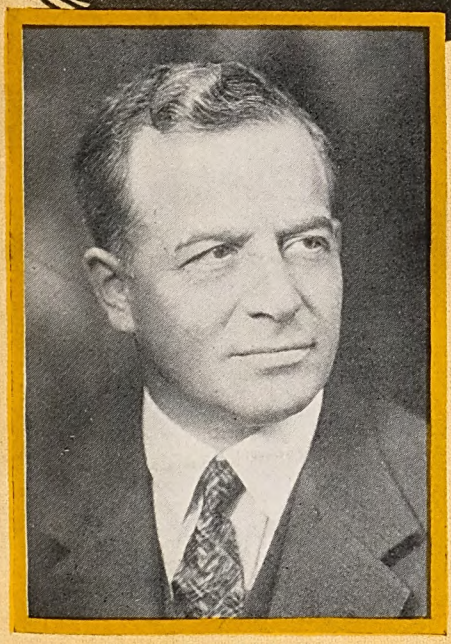
"Sweeping an Industry"



FRANK R. FAGEOL

Designer and originator of Street Car Type Twin Motored Coach, carrying 80 to 110 passengers.

We believe coaches with motors forward will hereafter be looked upon as old fashioned. Why should engines use up passenger capacity and waste street space? As always Frank R. Fageol is the leader in coach transportation-again his Twin Coach demonstrates this often spoken truth

TWIN COACH CORPORATION
KENT, OHIO

Twin Coach

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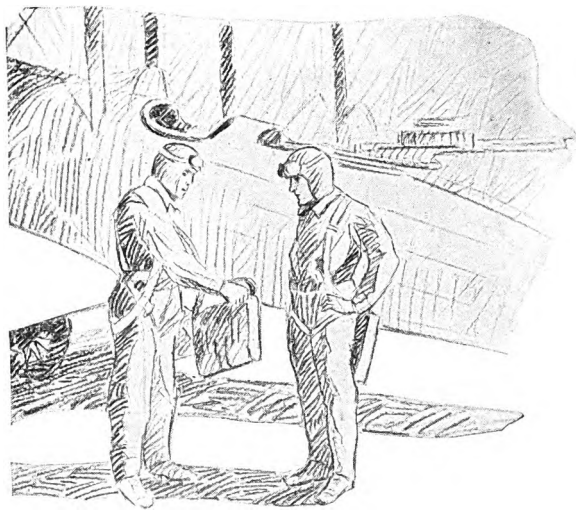

Protection

against extreme conditions

TO shoot through the clouds, a hundred miles an hour or more, the aviator needs special protective dressing—ordinary clothes won't do.

Railway motors also operate under conditions that call for more than "save-the-surface" varnish for insulation.

To effectually resist the vibration, the moisture and the extremes of heat and cold, the insulating varnish must have special characteristics. Westinghouse varnish No. 335 has those characteristics. This special varnish is an important factor in Westinghouse motor performance. Keep it on hand for any motor insulation that may become necessary from time to time. You can buy it by the can.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

TOUGHER THAN RHINOCEROS HIDE

Westinghouse

X91083

INSULATING Varnish

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1927

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Vol. 70
No. 27

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What Are the Prospects for 1928?

NOW that the old year draws to a close everyone's attention is focused on the question of what 1928 holds in store. This is the season when prognosticators reach the zenith of their activity. Their past mistakes have been dimmed by the charitable hand of time and there is as yet no way of checking the accuracy of their predictions for the future.

After all, fate is inexorable and the pages of the book of time are closed to human eyes. Expression of opinion as to what the future holds in store is worthless, except in so far as it is limited to an analysis of trends and probabilities based upon accumulated experience.

Look to the Annual Statistical Number of the JOURNAL, which will be dated Jan. 14, for the facts regarding the industry's trends. There also you will find a forecast of activity in 1928, based not on opinion, but upon the industry's budget estimated from the figures supplied by operating companies that co-operate in the preparation of this issue.

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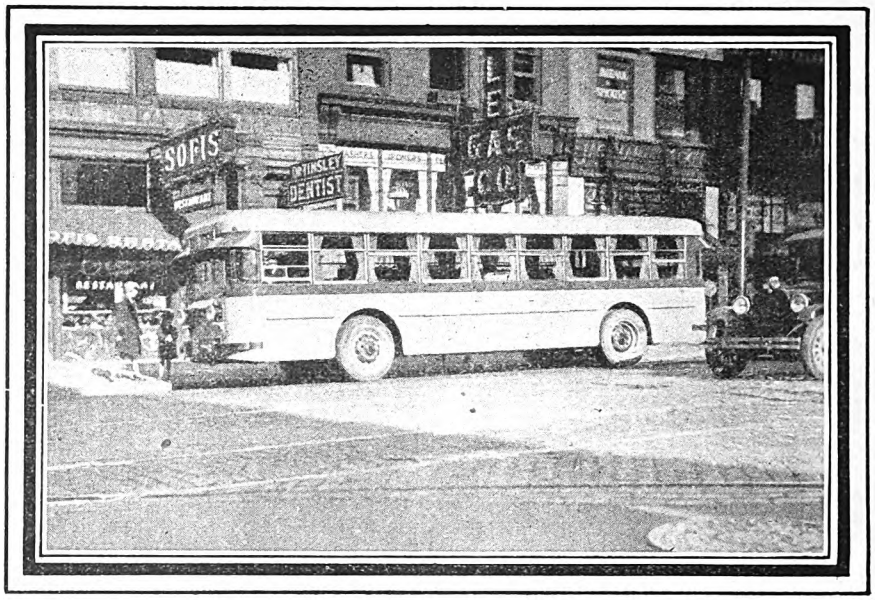

Fageol Twin Coach of the Pittsburgh Motor Coach Company. The Twin Coach as well as many other modern coaches is furnished with the Westinghouse Automotive Air Brake, as standard equipment.

More Air Braked Coaches for Pittsburgh

PERHAPS in no other city are coach operating conditions more severe. Heavy traffic congestion, long hard hills, and unusual competition for the right of way have made the Air Brake a necessity.

The Westinghouse Air Brake is not new to Pittsburgh. For the past several years, the Pittsburgh Motor Coach Company has operated various makes of motor vehicles, including White, Fageol, Safeway, and by recent delivery several Fageol Twin Coaches, also Westinghouse Automotive Air Brake equipped. With this array of equipment, under modern brake control, the Pittsburgh Motor Coach Company has been able to set and maintain perfect schedules in spite of the conditions under which they serve.

This is just one instance in which the Westinghouse Air Brake has played an auspicious part . . . A representative from any of our conveniently located offices will be glad to tell you of others and go over your braking problems with you . . . without obligation of course.

Hold your place in traffic lanes, get the benefits of your full speed and power, relieve drivers from undue physical exertion, protect your equipment from strain caused by unequal applications . . . modernize with the Westinghouse Automotive Air Brake.

WESTINGHOUSE TRACTION BRAKE COMPANY
Automotive Brake Division: **WILMERDING, PENNA.**

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WESTINGHOUSE
AUTOMOTIVE AIR BRAKES

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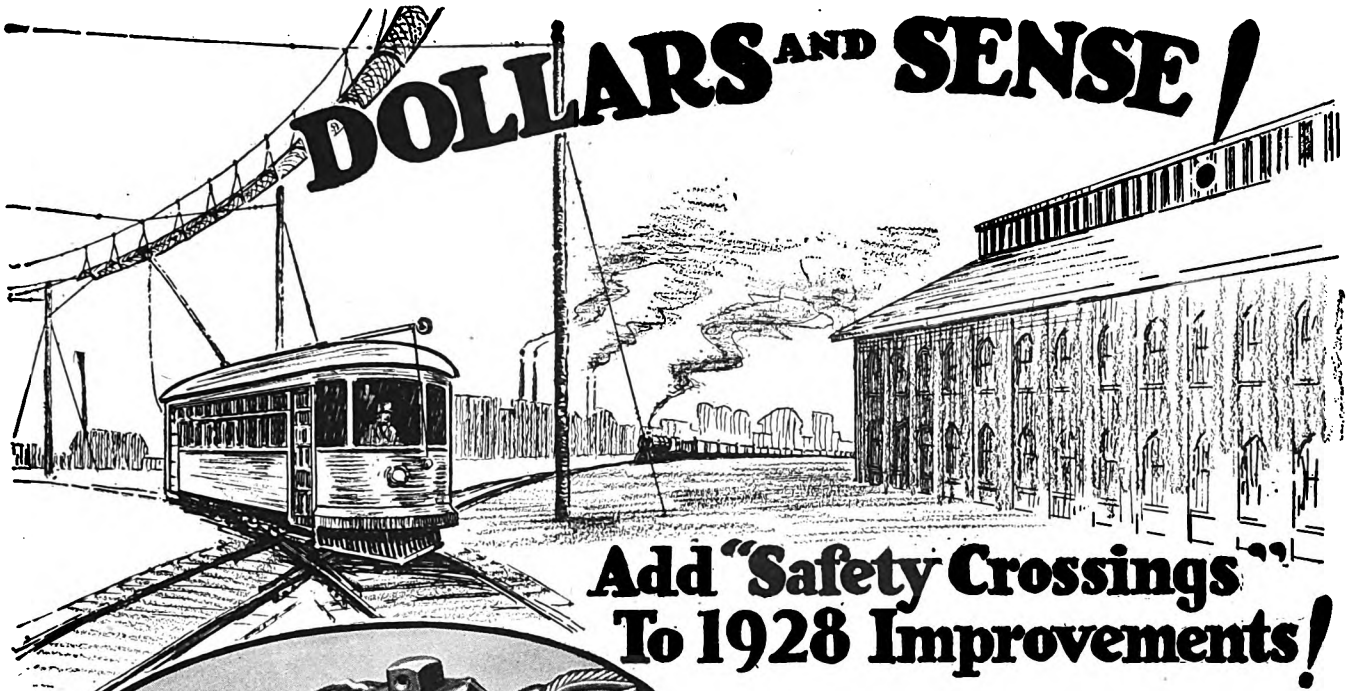
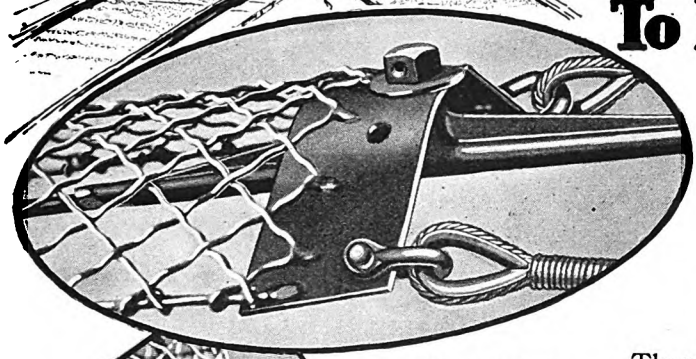
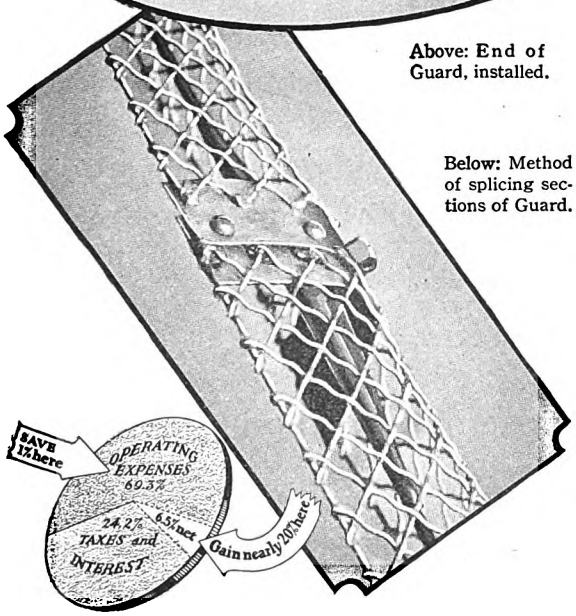


DOLLARS AND SENSE!

Add "Safety Crossings" To 1928 Improvements!



Above: End of Guard, installed.



Below: Method of splicing sections of Guard.

Service betterment, on which increased revenue depends, involves more than just major improvements in the design of cars. Detail improvements in operation and minor items of overhead equipment are equally important. "Safety Crossings" are among these minor improvements that loom large in making better service a fact.

YOU gain more than protection against dewirements, stalled cars, and possible serious accidents, when you make dangerous railroad crossings "Safety Crossings" with the installation of O-B Trolley Guard. Goodwill, faster schedules, and lower operating expense are additional rewards.

These important advantages follow because the installation of Trolley Guard shows a consideration for the car rider's safety and comfort that is not unnoticed; and because such installations prevent delays and save time at railroad crossings, thus speeding up schedules and reducing operating expenses.

The low initial cost of Trolley Guard—now 20% less than a year ago—makes its advantages available to every electric railway. And since Trolley Guard is made in 10-ft. sections, installation and maintenance expense is also lower today. For the new 10-ft. sections make it unnecessary to form the Guard on the job and to put it up in one long unwieldly piece. Formed at the factory before shipment, the Guard reaches you with yokes and end-plates attached, ready to hang.

Considering all these advantages of Trolley Guard, its cost is a small premium to pay for the large return on the investment. Therefore "Safety Crossings" may well be placed near the top of your list of improvements planned for 1928. For complete particulars address

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
776B

Ohio Brass Co.

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

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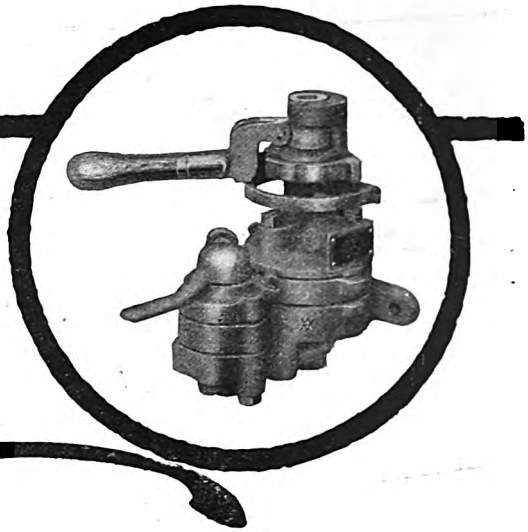
Interlocking brakes and doors by means of the M-28 Brake Valve with selective control, increases safety and convenience

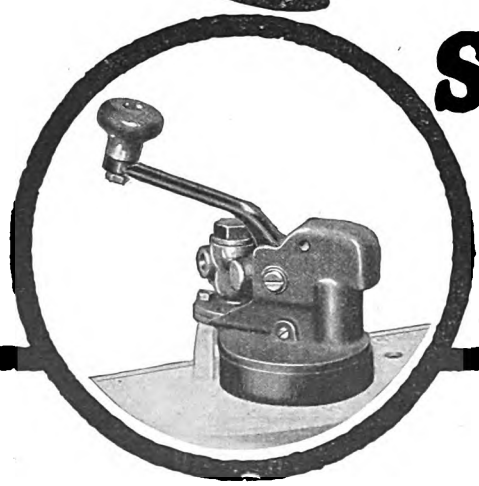


Giving Impetus to Transportation Service

SPEEDY transportation is vital to present-day conditions. Car riders want it; car owners need it.

An important factor in the realization of this objective is the Safety Car Control Equipment. It brings economic advantages that warrant additional cars . . . assures the quickest possible brake action . . . provides maximum convenience and flexibility in controlling entrance and exit . . . safeguards operation by interlocking power, brakes, and doors and by centralizing responsibility.

Safety Cars are giving a noteworthy impetus to transportation service on hundreds of traction properties.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

Interlocking the power and brakes by means of special controller handle provides safeguard against operator's inattention or disability

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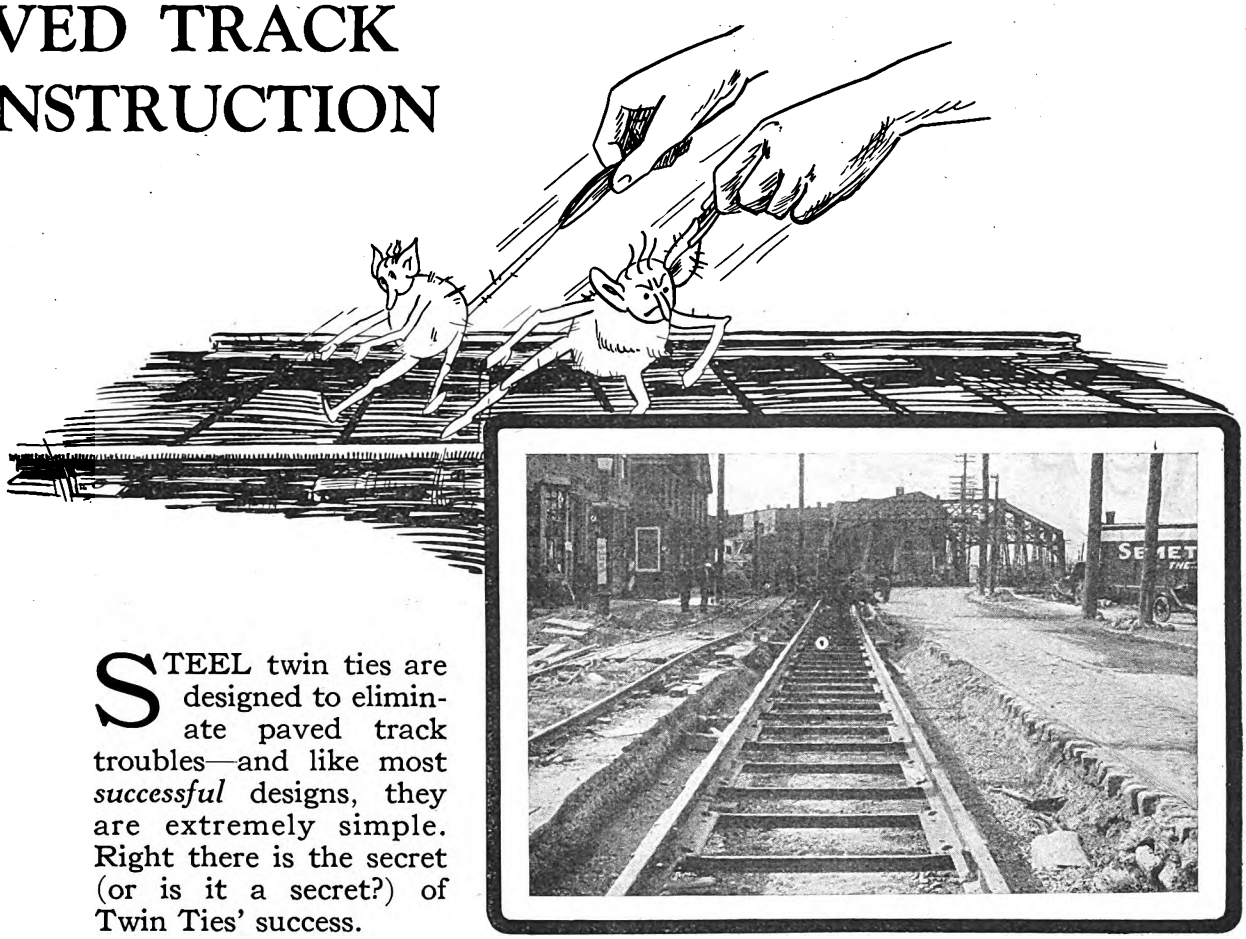
TAKING THE BUGS OUT OF PAVED TRACK CONSTRUCTION



STEEL twin ties are designed to eliminate paved track troubles—and like most *successful* designs, they are extremely simple. Right there is the secret (or is it a secret?) of Twin Ties' success.

Steel Twin Ties on Seneca St., Buffalo

And in eliminating such maintenance problems as spreading rails, rotted ties, pavement breakdowns, weakened joints, cracked foundations and the like, we have added many strengthening features. Twin ties become as much a part of the foundation as the concrete itself.

Add to all this the initial economy of using Steel Twin Ties and there is but one course to follow in planning your 1928 extension or rehabilitation campaign.

Write today for delivered prices.

THE INTERNATIONAL STEEL TIE CO.

CLEVELAND, OHIO

Steel Twin Tie Track

THE BASE OF MODERNIZATION

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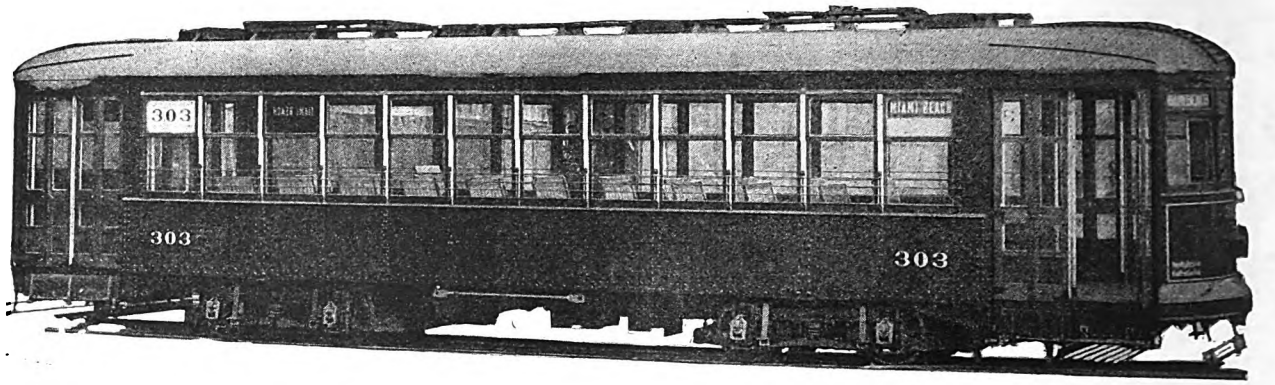

In 1928 buy cars that create the desire to ride—

and to repeat a comfortable ride—

buy

"Thomas-Built" Cars

Some communities served by "Thomas-Built" Cars

Augusta, Ga.
Helena, Mont.
Miami, Fla.
Durham, N. C.
Trenton, N. J.
New Orleans, La.
Hampton, Va.
Sheffield, Ala.
Danville, Va.
Greenville, S. C.

Their extreme safety, attractive appearance and unusual comfort make them a welcome asset in any community.

And on the basis of lower operating costs and maintenance expense, *"Thomas-Built"* Cars have certainly proved their worth.

Note the list of prominent installations—typical of the many other cities being served by *"Thomas-Built"* Cars.

What you may expect *"Thomas-Built"* Cars to accomplish for you, might be demonstrated with figures of what they have accomplished on other well-known electric railways. Shall we send you these figures?

PERLEY A. THOMAS CAR WORKS

High Point, N. C.

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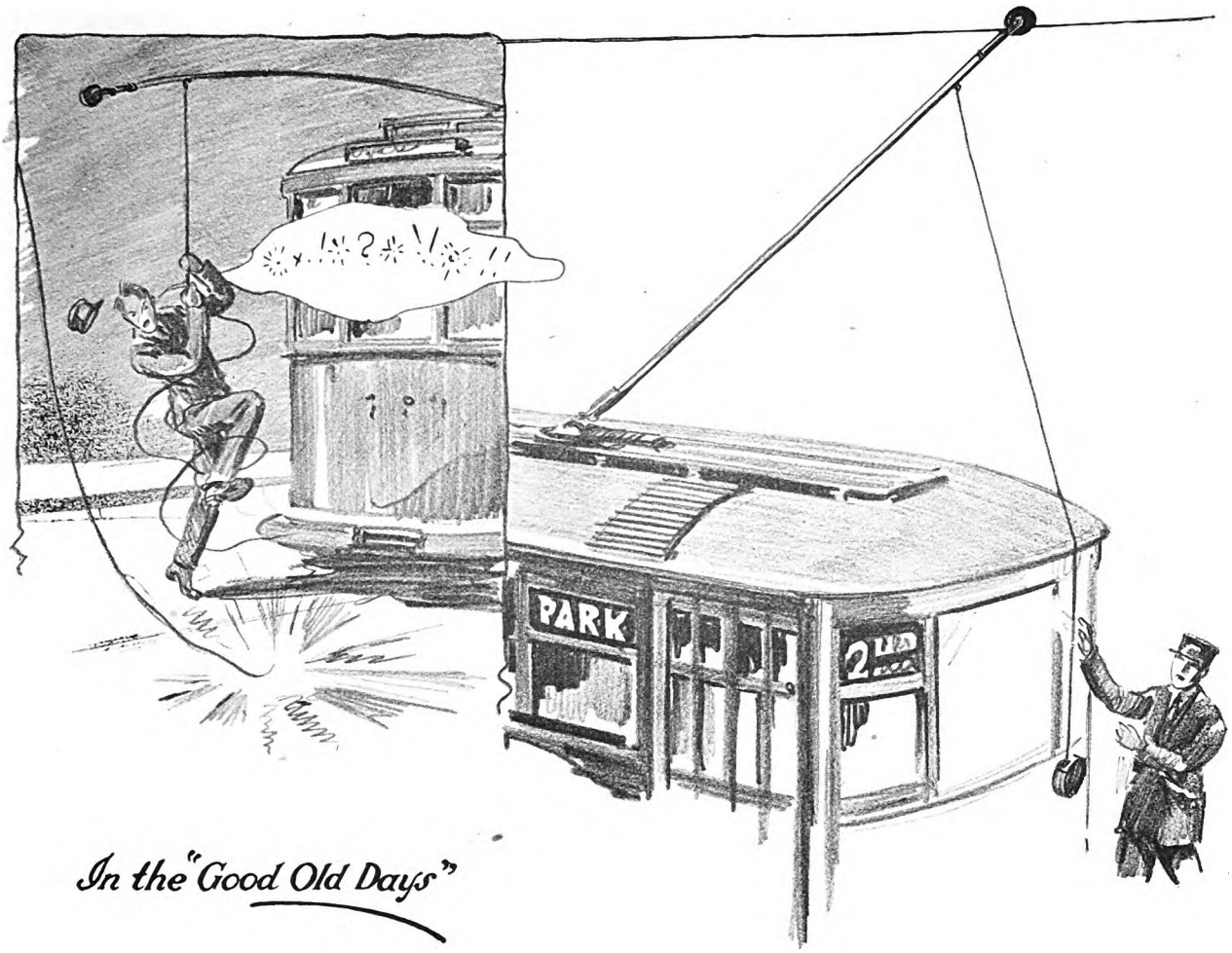

In the "Good Old Days"

and To-day:

Many a wreck was made of the overhead system when a trolley pole jumped the wire. For there'd be a resounding smack and the wire would come tumbling down. And what the motorman said was never fit to print. Not to mention the cost to the company in tied up service, repair bills and other items that eat into profits.

There's no such trouble nowadays when Keystone Trolley Catchers are used. They catch the pole with the speed and precision that a baseball catcher picks off a foul tip. The only delay is the minute the motorman takes to put the trolley back on the wire.

Other items that cut down costs and sell more rides are fully described and illustrated in Catalog No. 7. Write us for your copy.

Keystone Trolley Catchers

Trolley catchers are for use on railway cars to "catch" the trolley pole when it leaves the wire. Their construction enables these catchers to "catch" the pole an instant after it "flies," saving the "banging" of the overhead structure and the resulting wear and tear and expense involved for repairs and delays in service.

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District Offices at 230 So. Clark St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

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Turning a Public Utility Deficit *into a* Public Utility Profit ≈

with YELLOW COACHES

anbury Power & Transportation Co., Danbury, Conn.

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They did it in

	AVERAGE MONTH of Street Car Operation Year 1925	AVERAGE MONTH of Motor Coach Operation 9 Months, 1927
Operating Revenue	$12,299.62	$11,680.14
Operating Expense	10,566.64	7,694.63
Depreciation	0.0	821.39
Taxes	791.67	643.30
Net Operating Income	$941.31	$2,520.82

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DANBURY ~ CONN.

DANBURY was faced with a serious transportation problem—a problem that finds its duplicate elsewhere. Street car patronage was constantly declining. Track and rolling stock were in bad condition and the operating company could not hold their patronage because they could not sell transportation. Financial conditions made it impossible to rehabilitate.

In 1924, A. William Sperry, transportation and managing engineer, was employed by the bond holders' committees to examine the property and make recommendations for improving service. On November 19, 1926, the company was reorganized and Mr. Sperry was made Vice President and Manager with instructions to carry out the recommendations he had suggested. Shortly thereafter, street car service was abandoned and a 100 per cent motor coach operation, using Yellow Coaches, was effected. The substitution was complete. Since then, not a street car wheel has turned in Danbury.

Operating expenses decreased 27%
Net income increased 267%
Investment decreased 70%

And the Danbury Power & Transportation Company owns outright their garage, repair shop and offices and have properly included organization expense in their investment account.

Today, after thorough test and comparison, the operation shows—

That all passenger requirements in a normal American factory city of 30,000 can be successfully and profitably met by motor coaches, and in this case, without change in normal street car fare.

That in such a city, motor coach operation requires less than one-third the investment necessary for street car operation.

That a well managed but financially unsuccessful street car operation can be completely replaced by motor coach service and earn a satisfactory profit.

That efficient, up-to-date management, equipment of proper capacity and construction and carefully planned maintenance work will win public approval and gratifying financial results.

That a completely motorized service permits the serving of sparsely settled territory not formerly reached by street car service and the absorption of the losses incurred in such service.

Danbury rush hour demands are the same as in any normal factory city of comparable size. Street paving conditions were unusually good in-so-far as the street car company was concerned and much of the track was laid in the open between two paved lanes.

They did it in Danbury! "And how" is shown on the next page.

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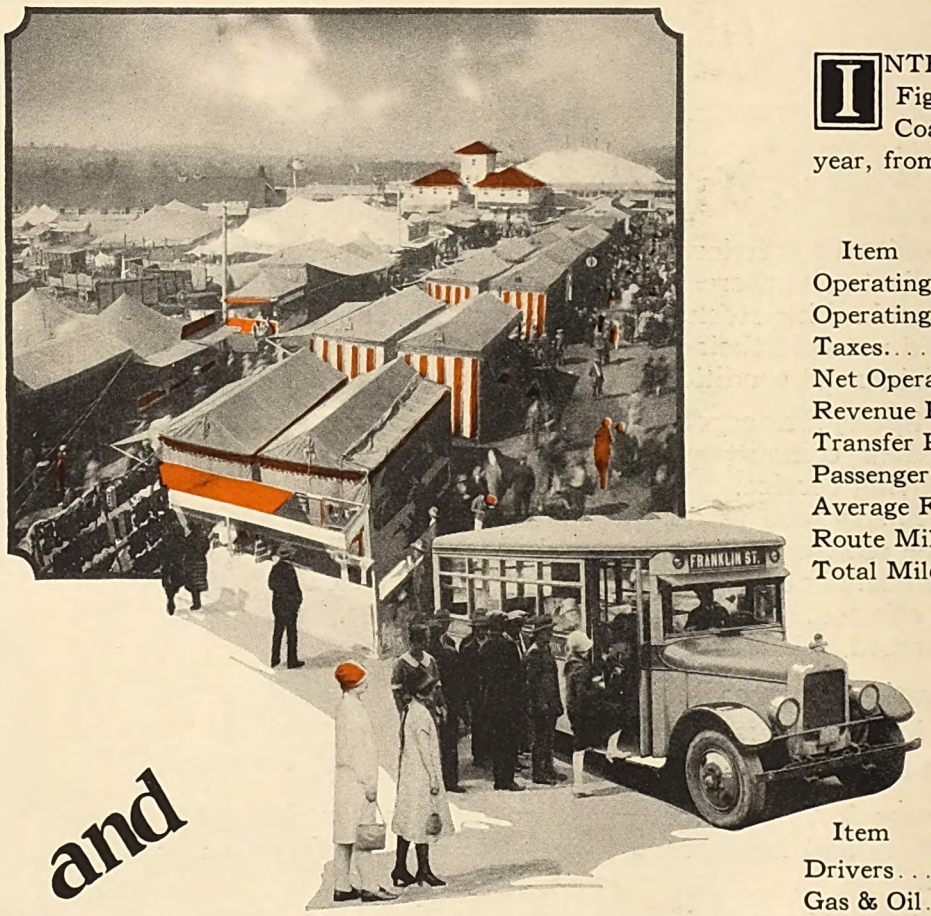
figures that talk



and

at the DANBURY FAIR

Every year, in October, Danbury has a Fair, held on the outskirts of the city. During Fair Week, the population of Danbury is increased 75%.

Formerly, the street car line running to the Fair grounds was woefully inadequate to carry the crowds. This year, Yellow Coaches handled the demands of mass transportation without a hitch. During the rush periods, Yellow Coaches left the Fair grounds on a schedule of less than three minutes without interrupting regular service. From a normal daily passenger carriage of approximately 3,900 on all lines, over 9,304 people were carried during one day of the Fair. And during the entire week, with every unit for equipment in constant use, there was only one case of mechanical trouble for the entire fleet.

INTERESTING Revenue and Statistical Figures covering the operation of Yellow Coaches for the first nine months of this year, from January 1 to September 30.

Item	9 Months Period	Per Coach Mile
Operating Revenue	$105,121.25	28.44
Operating Expense	76,644.15	20.73
Taxes	5,789.47	1.57
Net Operating Income	22,687.63	6.14
Revenue Passengers	1,078,058	
Transfer Passengers	122,855	
Passenger Revenue	$103,971.55	
Average Fare	9.6	
Route Miles Operated	17.5	
Total Mileage	369,627 miles	

OPERATING COSTS

Covering the operation of Yellow Coaches for the first nine months of this year, from January 1 to September 30.

Item	9 Months Period	Per Coach Mile
Drivers	$21,128.65	5.72
Gas & Oil	10,366.63	2.80
Garage Labor & Expense	6,525.09	1.77
Superintendence & Misc.	3,159.74	.85
Total Transportation	$41,180.11	11.14
Maintenance of Buildings & Equipment	$9,759.93	2.64
Depreciation	7,392.54	2.00
Total Maintenance	$17,152.47	4.64
General Officers & Office Supplies	$7,720.00	2.09
Insurance & Damages	9,027.43	2.44
Legal & Other Expenses	1,564.15	.42
Total General	$18,311.57	4.95
Grand Total	$76,644.15	20.73

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.

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Wishing you a

Merry Christmas

and a HAPPY · NEW · YEAR

NATIONAL PNEUMATIC COMPANY

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ly rebuilding?

The difference is important to future-minded electric railway operators. The one implies leadership, the other an effort to "follow the crowd."

We of the Cincinnati Car Company are earnestly endeavoring to build a leadership standard into the electric car of today and tomorrow.

We have established a principle of car-building,—BALANCED LIGHTWEIGHT DESIGN,—which brings every step in the building of the modern car under one thoroughly competent supervision.

We have capitalized long truck building experience to develop three of the most advanced types, at present available, the Cincinnati Lightweight City-type Truck, the Cincinnati Lightweight High-Speed Interurban-Truck, and the Cincinnati Cast Aluminum Frame Worm-Drive Truck.

We have developed and perfected the Duplex Air and Magnetic Brake for both city and interurban service. Furthermore we have installed in our plant the most efficient low-cost "mass production" machinery.

If you too, as an operator, are interested in *building* rather than rebuilding, we can work together to our mutual benefit. Bear in mind that every installation of Cincinnati NEW Lightweight Cars made to date has been successful.

Cincinnati Car Company, Cincinnati, Ohio

CINCINNATI
BALANCED LIGHTWEIGHT CARS

—still a step ahead of the modern trend

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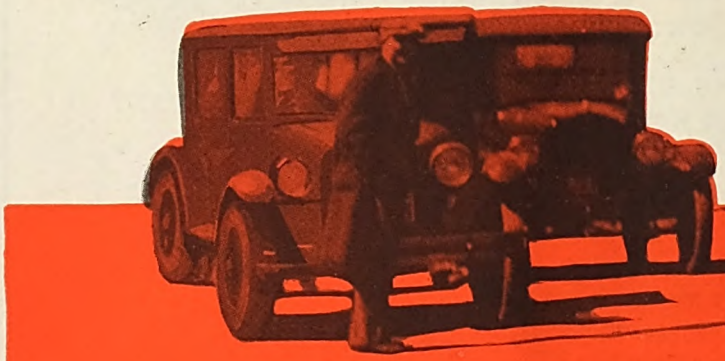
These deluxe single-truck cars increased revenue 7% in eight months



—in Jamestown, N. Y.

With good track, the light-weight, one-man, single truck, safety car is without competition in economical transportation.

That cars of this type, whose greatest utility is confined to cities of less than 100,000 population where automobiles make greatest inroads on operating revenue, should meet transportation needs profitably is a remarkable tribute to the industry.

The Jamestown Street Railway, Jamestown, N. Y., had faith in such cars—products of the Quality Shops—and increased revenue 7% in eight months—and this in spite of the increased first cost of de luxe equipment.

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The foresight of Jamestown is the hind sight of many operators—give the public the comfort they demand and they'll "come again."

There's a steady welcome jingle in the fare boxes of St. Louis cars.

St. Louis Car Co.

Quality Cars

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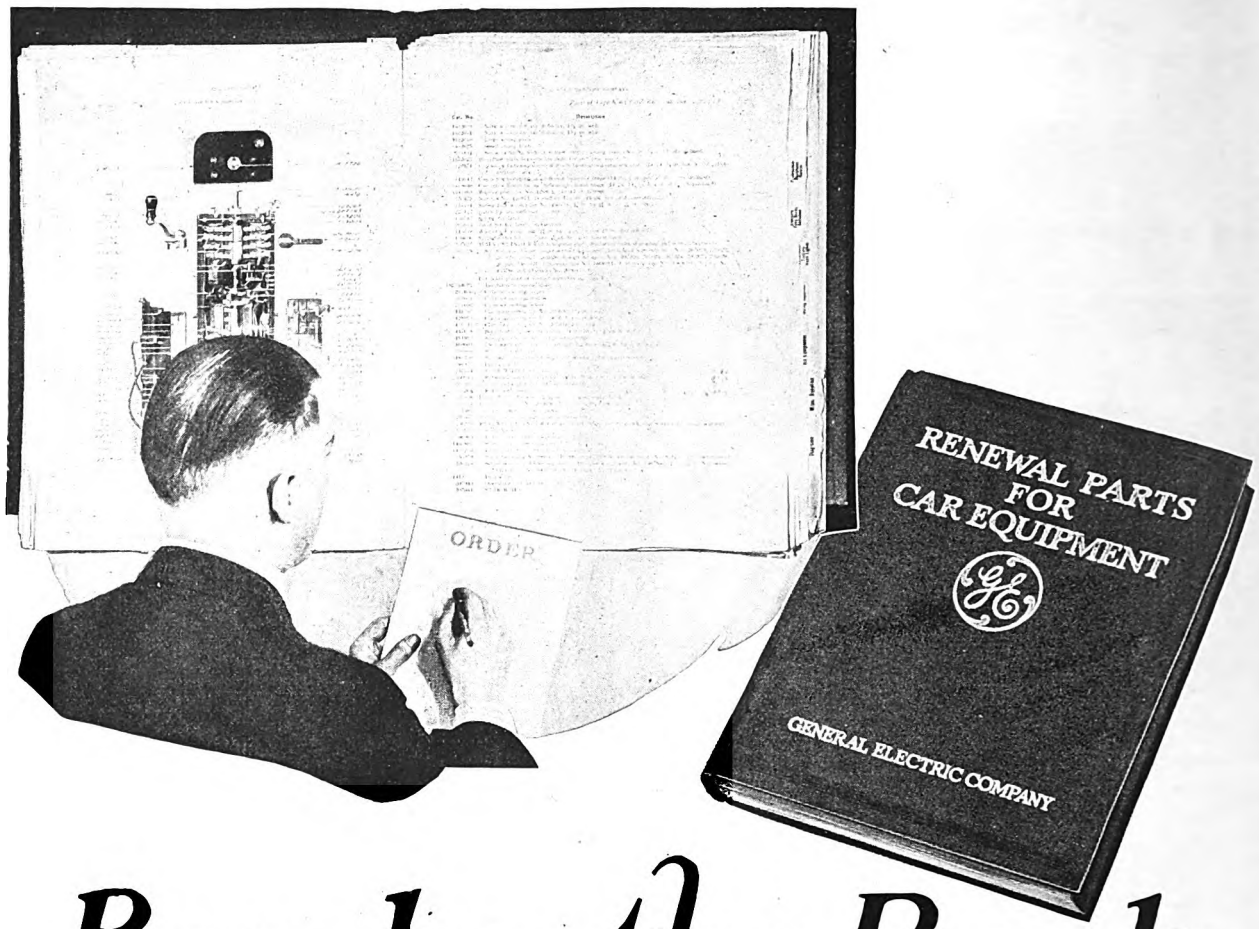

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for original equipment quality

To obtain renewal parts that fit; to obtain exact duplicates of the originals, in quality and workmanship; to be certain of a life equal to that of the originals, order from the equipment manufacturer.

Your G-E Renewal Parts Catalog was prepared individually for you in order to help you carry out this policy—the only safe policy.

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Your G-E Renewal Parts Catalog gives you exact ordering information for all parts, insuring duplication of the originals. Your G-E Railway Supply Catalog is a guide to modern equipment standards, and can be consulted to advantage in connection with your modernization program.

5403

GENERAL ELECTRIC

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Ten Semi-Steel Cars Being Built for Boston Elveated

The ten cars ordered by the Boston Elevated Railway, Boston, Mass., on Aug. 3 from the Laconia Car Company, Laconia, N. H., as announced in the Aug. 20 issue of the JOURNAL, are to be delivered during the 40-day period between Dec. 1, 1927, and Jan. 10, 1928. They are to be placed in service in South Boston and will replace the old box cars now in use there.

The cars, with a seating capacity of 48, are being built at a cost of approximately $12,000 each. They are of the one-man, two-man, double-end, double-truck type, having a total weight of 31,460 lb. and a length over all of 45 ft. 0 in. The body is of semi-steel construction with end doors and has an arch roof. The seating arrangement includes four longitudinal and sixteen cross seats, with a spacing of 29⅝ in. The painting scheme is to be yellow.

Operating equipment includes four G.E. 264-A inside-hung motors, G.E. K-71 control and Westinghouse air brakes with variable load attachment.

The official specifications are as follows:

No. of units	10
Type of unit	One-man, two-man, motor, passenger, city, double end, double truck
Seating capacity	48
Builder of car body	Laconia Car Company
Date of order	August 3, 1927
Date of delivery	Dec. 1, 1927, to Jan. 10, 1928
Weights:	
Car body	13,800 lb.
Trucks	8,700 lb.
Equipment	8,960 lb.
Total	31,460 lb.
Bolster centers	20 ft. 9 in.
Length over all	45 ft. 0 in.
Length over body posts	30 ft. 11½ in.
Truck wheelbase	5 ft. 2 in.
Width over all	8 ft. 6½ in.
Height, rail to trolley base	10 ft. 7½ in.
Window posts spacing	31½ in.
Body	Semi-steel
Roof	Arch
Doors	End, folding
Air brakes	Westinghouse, variable load attachment
Armature bearings	Plain
Axles	Pittsburgh Forge & Iron Company
Compressors	DH-16
Conduit	Flexibe
Control	General Electric K-71
Couplers	Malleable iron sleeve
Destination signs	Keystone
Door mechanism	National Pneumatic Company
Energy-saving device	Railway Improvement Co.
Fare boxes	Johnson
Finish	Flood-Conklin
Floor covering	Wood
Gears and pinions	General Electric spur
Glass	Double thick
Hand brakes	National staffless
Hand straps	Rico
Heat insulating material	Salamander
Heaters	Consolidate l Car Heating Company
Headlights	Derssel
Headlining	Bronze and malleable iron
Journal bearings	Plain
Journal boxes	Steel castings
Lamp fixtures	Weber No. 61000
Motors	Four General Electric 26-A, inside hung
Registers	International single
Roof material	Wood and canvas
Seats	J. G. Brill Co.—4 longitudinal
Seat spacing	29⅝ in.
Seating material	Wood slat
Slack adjusters	M-1
Steps	Folding
Step treads	Wood universal tread nosing
Trolley catchers	Earll
Trolley base	Ohio Brass
Trucks	Taylor, type LRH
Ventilators	Garland
Wheels, type	Steel, 26-in. diameter
Wheelguards	Wood li e guards on trucks

{ *Electric Railway Journal, October 8, 1927, page 722.* }

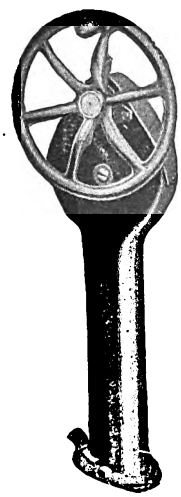
Ten more for the Boston "L" equipped with

"Peacock" Staffless Brakes

Reg. U. S. Pat. Off.

To replace the old box cars now in use in South Boston the Boston Elevated Railway has ordered ten one-man, two-man, double-end, double-truck type cars from the Laconia Car Company, Laconia, N. H., equipped with "Peacock" Staffless Brakes.

Whenever and wherever new cars are ordered, in every type of service, "Peacock" Staffless Brakes will usually be found in the specifications.



May we give you the reasons?

National Brake Company, Inc.

890 Ellicott Square, Buffalo, N. Y.

Canadian Representative

Lyman Tube & Supply Co., Ltd., Montreal, Can.

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ANNUAL

Statistical and *Forecast* *Number*

Electric Railway Journal
January 14, 1928

This important number will contain:

Record of 1927 in costs and revenues.

Number of cars purchased.

Miles of track constructed and reconstructed.

Financial records for 1927.

Reviews of basic tendencies in legal, financial and regulatory matters.

A review of the significant news developments of 1927.

Together with:

A forecast of 1928 expenditures in all departments, and the trends which will shape developments and progress of 1928.

Advertising forms close January 3, 1928

Electric Railway Journal
Tenth Ave. at 36th St., New York City

Member ABC

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Studebaker

Announces a New Bus Chassis for fast Highway Service

High Speed Bus Chassis *by*

STUDEBAKER

MORE SPEED

With Less Weight

Studebaker Bus Models and Prices

"75" Model—184″ wheelbase, dual rear wheels chassis only	$3275
21-Pass. Street Car Bus ("75" model chassis)	5895
"75" Special High Speed Chassis—184″ wheelbase dual or single rear wheels (chassis only)	2775
19-Pass. Cross-Seat Sedan on "75" special chassis	5275
20-Pass. Parlor Car De Luxe on "75" special chassis	6395
22-Pass. Observation Parlor Car on "75" special chassis	6395
"75" Junior Model—158″ wheelbase (chassis only)	2410
12-Pass. Cross-Seat Sedan on "75" Jr. chassis	4160
15-Pass. Cross-Seat Sedan ("75" Jr. chassis)	4520

All prices f. o. b. factory. Purchase can be arranged on Studebaker's liberal budget payment plan

Again Studebaker has produced a bus chassis which fully meets present day traffic conditions and the operator's requirements on long, fast schedules. This new "75" special high speed chassis has a wheelbase of 184 inches. It has 800 pounds less weight than the "75" heavy duty chassis. All "75" chassis because of recent motor refinements have greater power—the present Studebaker six-cylinder engine develops over 90 h. p. at 2600 r. p. m. The specially designed three speed forward transmission and rear axle with the more powerful motor and with less weight to carry, permit quicker acceleration, more speed on the road and greater economy of operation.

The same heavy, pressed steel frame and nine cross-members are retained, the same rugged type of construction is used throughout the entire chassis and body. At no point has there been any compromise with strength. Several new features have

The New Studebaker 75

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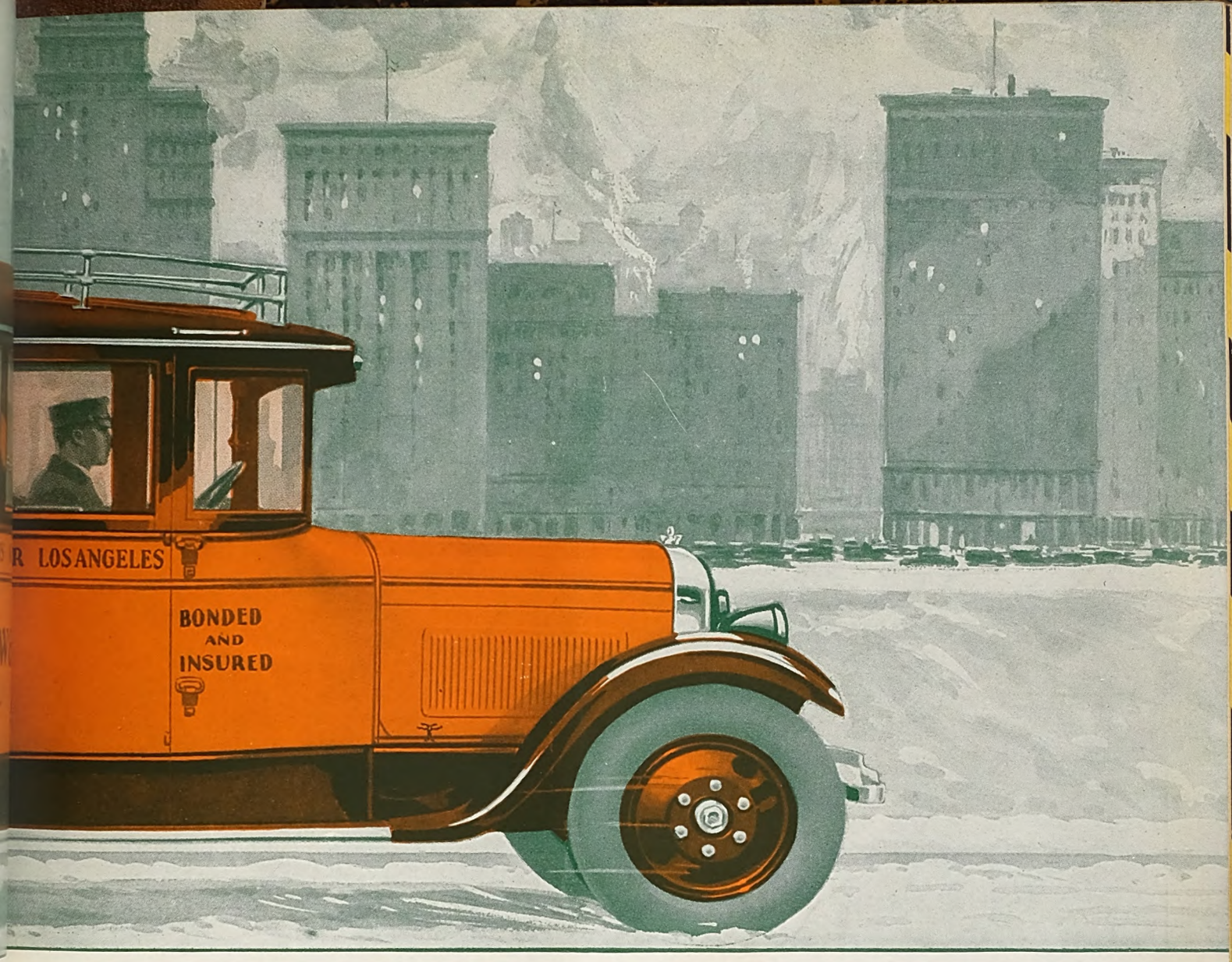


-MORE POWER

and at Lower Cost

been incorporated. The engine has a high compression head; the generator is cooled with a centrifugal blower type fan; the specially designed rear axle is equipped with heavy bumper blocks which act as an auxiliary spring and bumper; the new double-face emergency brake operating on the propeller shaft is 14 inches in diameter.

The four-wheel mechanical brakes operate smoothly and easily, at 40 miles per hour to a full stop in 71 feet, or in 17 feet at 20 miles per hour. Notable ease of steering and a motor that is instantly responsive enables the driver to handle the Studebaker "75" high speed bus with the comfort and surety of a passenger car.

With these new features, less weight, greater power and lower cost, this new Studebaker "75" special high speed chassis offers a new conception of bus chassis value at $2775.

Mail this coupon for further particulars

THE STUDEBAKER CORPORATION
OF AMERICA
Dept. B, South Bend, Ind.

Please send me complete specifications of your "75" Special, without obligation.

We have.....busses at present. Check below the Studebaker Bus about which you desire information.

Chassis model.....Type: Sedan.....Parlor Car.....

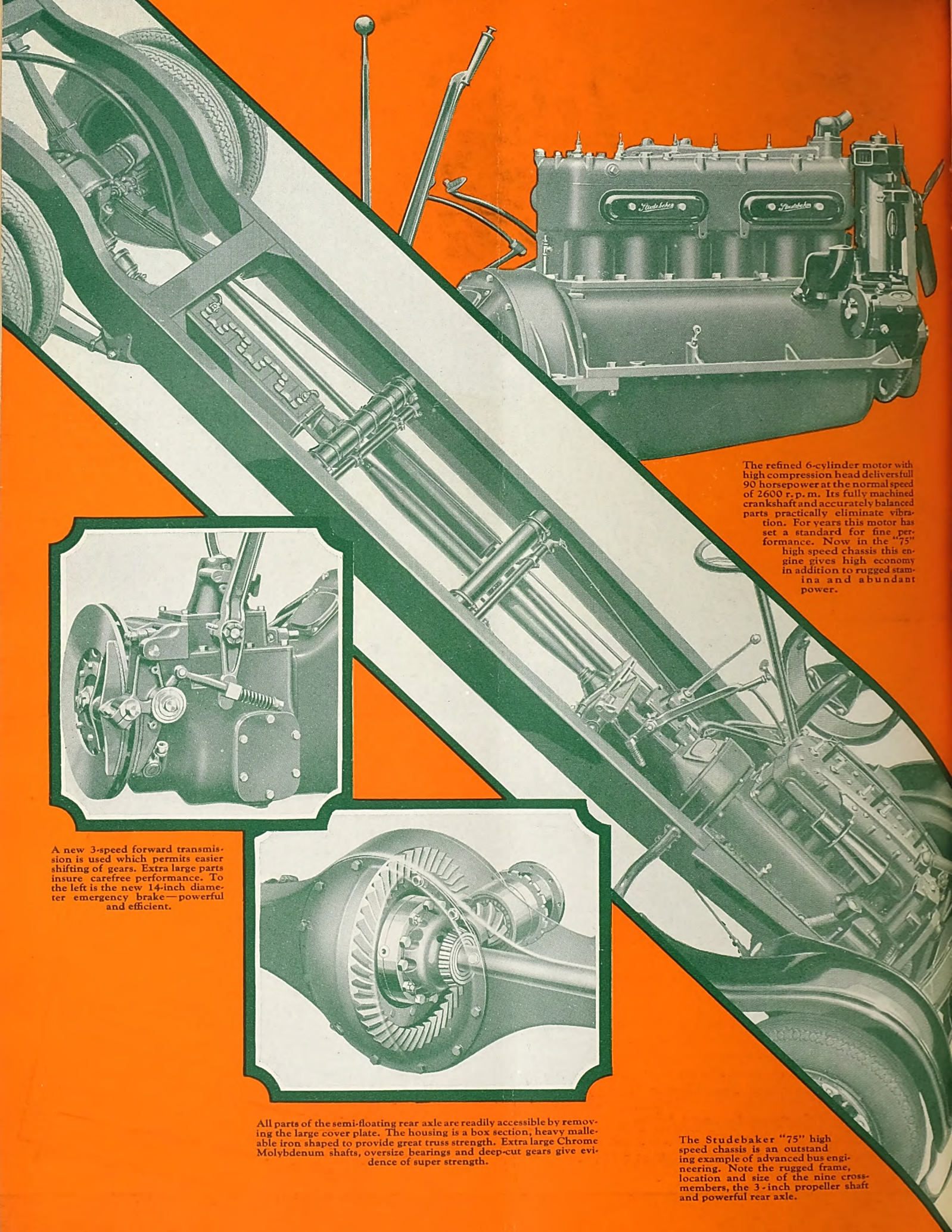
Street Car Type.....Capacity.....Passenger.

Name.....

Address.....State.....

City.....

High Speed Bus Chassis



The refined 6-cylinder motor with high compression head delivers full 90 horsepower at the normal speed of 2600 r. p. m. Its fully machined crankshaft and accurately balanced parts practically eliminate vibration. For years this motor has set a standard for fine performance. Now in the "75" high speed chassis this engine gives high economy in addition to rugged stamina and abundant power.

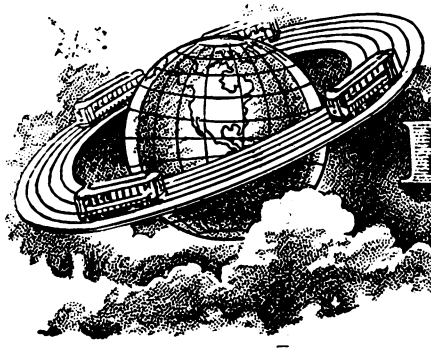
A new 3-speed forward transmission is used which permits easier shifting of gears. Extra large parts insure carefree performance. To the left is the new 14-inch diameter emergency brake—powerful and efficient.

All parts of the semi-floating rear axle are readily accessible by removing the large cover plate. The housing is a box section, heavy malleable iron shaped to provide great truss strength. Extra large Chrome Molybdenum shafts, oversize bearings and deep-cut gears give evidence of super strength.

The Studebaker "75" high speed chassis is an outstanding example of advanced bus engineering. Note the rugged frame, location and size of the nine crossmembers, the 3-inch propeller shaft and powerful rear axle.

The New Studebaker 75 High Speed Bus Chassis

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.



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Mills Bldg., 17th and Pa. Ave., Washington, D. C.

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Car Heating and Ventilating

—are no longer operating problems. We can show you how to take care of both with one equipment. The Peter Smith Forced Ventilation Hot Air Heater will save, in addition, 40% to 60% of the cost of any other car heating and ventilating system. Write for details.

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519 Delta Bldg., Los Angeles, Cal.

Bemis Car Truck Company
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We make a specialty of

ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULC on your equipment

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WE MANUFACTURE various types of trolley equipment. The quality of metal, conductivity, resistance to friction, effect on overhead, shape and size of wheel groove, have all been carefully worked out and perfected. In addition to the highly specialized V-K Oilless Trolley Wheels and Harps, More-Jones make the most complete line of lubricated trolley wheels and harps to meet all requirements. Let us quote you.

National Bearing Metals Corporation
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"MORE-JONES QUALITY PRODUCTS"

Structural Shapes · Steel Sheet Piling
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PITTSBURGH PENNSYLVANIA

1839

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410 North Michigan Ave.
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Griffin Wheels

with Chilled Rims and Chilled Back of Flanges For Street and Interurban Railways

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In go the parts —off come the grease and dirt!

WHAT simpler way to clean dirty, grease-covered bus and car parts?

Tedious hand scrubbing practices are fast being discarded in favor of this better, easier Oakite method of *soaking* parts clean. With the result that considerable time and effort are saved; repair jobs are speeded up; maintenance costs lowered.

Test out Oakite cleaning materials in your own shops. Find out what these advantages will mean to you in actual dollars and cents savings. Drop us a card and our Service Man will call.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada

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Industrial Cleaning Materials and Methods

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Yes~ We Sell Dayton Ties To Friends

Selling Them Makes Friends

DAYTON MECHANICAL TIE COMPANY
DAYTON, OHIO

Yes—We Sell Dayton Ties to Friends

Because Selling Them Makes Friends, Our Repeat Orders Show It

We don't sell Dayton Ties to people because they are our friends—our customers are friends because we sell them Dayton Ties.

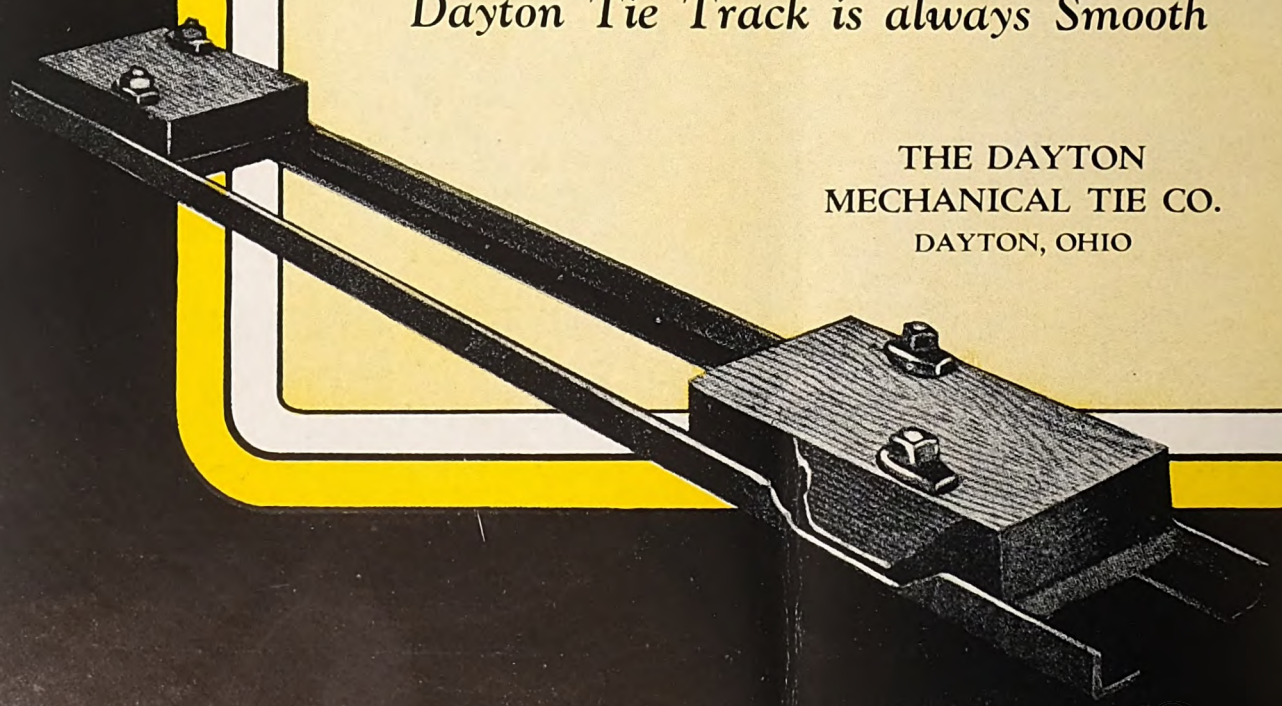
When electric railway officials get hold of something like Dayton Ties, which practically wipe out track maintenance they are naturally friendly—you can't blame them.

Dayton Ties do not merely obliterate track maintenance for a year or two, but for astonishing periods of years. Since their inception 16 years ago no track laid on Dayton Ties has ever failed.

Installations in 150 cities, under every kind of traffic the industry has to offer, meeting all kinds of adverse conditions—and not a failure. They continue to order—time after time.

Once you try Dayton Ties, you will be a friend, too.

Dayton Tie Track is always Smooth



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DAYTON, OHIO

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Special Machinery
and Patterns

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The Columbia Machine Works *and M. I. Co.*
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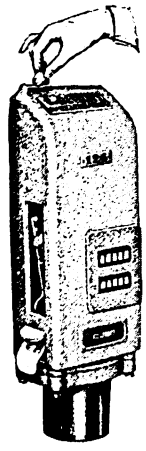

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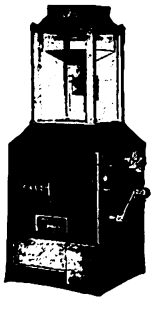
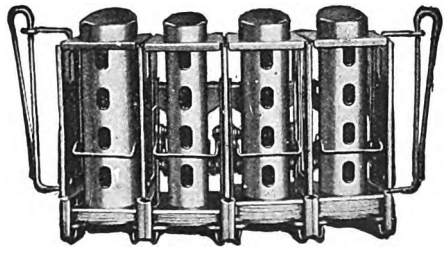
Johnson Electric Fare Boxes and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 4000 already in use.

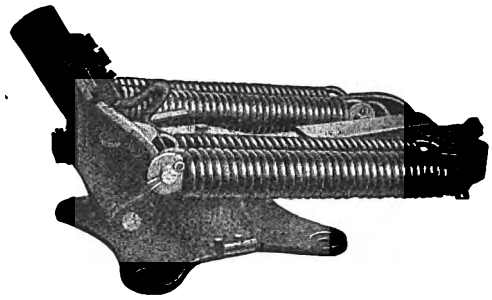
When more than two coins are used as fare, the Type D Johnson Fare Box is the best manually operated registration system. Over 50,000 in use.

Johnson Change-Makers are designed to function with odd fare and metal tickets selling at fractional rates It is possible to use each barrel separately or in groups to meet local conditions. Each barrel can be adjusted to eject from one to five coins or one to six tickets.





Johnson Fare Box Co.
4619 Ravenswood Ave., Chicago, Ill.



Nuttall US 20-A Timken Roller Bearing Trolley Base

Grease 'er Twice a Year And Let 'er Go

You have smiled for years at the original feller in Coatesville who tells you to "Hook 'er to the Biler"—that's *amusement.*

But if you want to wear the smile of *genuine satisfaction*, and see that smile on every conductor's face—on every face around the car barn, here's a sure fire prescription:

Put on some Nuttall US 20-A Trolleys. It is literally true that you can lubricate them twice a year and forget them. They swivel on Timken Tapered Roller Bearings, and you know what they are. Every wearing part is hardened, and you can forget wear. Heavy shunts conduct the current around bearings and moving parts, so you can forget arcing troubles. All in all, what could be sweeter?

MEMBER AERA 1927

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

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EXECUTIVE—Fifteen years' experience managing light, power and transportation properties. Open for other connections; personal reasons for desiring change. PW-69, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

GENERAL superintendent or manager; fifteen years' successful experience. PW-55, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT, fifteen years' experience in city, interurban and bus transportation in foreign countries and United States; can speak Spanish. PW-68, Electric Railway Journal, Tenth Avenue at 36th St., New York.

SUPERINTENDENT equipment, M. M. efficiency; work unit cost production appointment wanted; highest personal references; 25 years' experience steam electric, stores; wide bus experience in London and U. S. A. and public relations; willing to go anywhere. PW-70, Electric Railway Journal, Tenth Ave. at 36th St., New York.

SUPERINTENDENT of transportation, ten years' experience in high speed interurban and city operation, desires position in the South. Best of references. PW-72, Electric Railway Journal, Tenth Ave. at 36th St., New York.

While they last

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Deferred payment plan—Pay out of earnings. Will exchange for your old equipment

29—OVERHAULED NEWLY PAINTED, complete and ready to run, Whs-508 Motors, K-63 Controllers, Brill 79-E Trucks, DH-16 Compressors. Price each..... $1500
F.O.B. Cars New York City

23—Good operating condition, complete and ready to run, GE-258 Motors, K-63 Controllers, Brill 79-E Trucks, CP-27 Compressors. Price each..... 1000
F.O.B. Cars New York City

11—Good operating condition, complete and ready to run, GE-264 Motors, K-63 Controllers, Brill 79-E Trucks, CP-27 Compressors. Price each..... 1500
F.O.B. Cars New York City

Extra Motors, Trucks, Compressors, Controllers, etc.

Transit Equipment Company

Cars—Motors

501 Fifth Avenue, New York

WANTED

MOTOR

1—Westinghouse 68 or 68C Motor, railway type, 500 volts. Will consider armature. Only quote price and point of delivery.

W-73, Electric Railway Journal
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FOR SALE

Following Peter Smith Heaters in good operating condition:

35—No. 2 Smith Heaters.
16—Type "A" Smith Heaters.
6—Type "C" Smith Heaters.
1—Type "CC-2" Smith Heaters.

The Milwaukee Electric Ry. & Lt. Co.,
Public Service Building, Milwaukee, Wisc.

FOR SALE

15 BIRNEY SAFETY CARS

Brill Built
West, 508 or G. E. 264 Motors
Cars Complete—Low Price—Fine Condition
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

We buy entire Railways and Power Plants

H. E. SALZBERG COMPANY, Inc.

225 Broadway New York City

We sell Street Railway and Power equipment

Don't Say, "*It isn't worth anything*"

THAT surplus Used Equipment you have lying around the shop or yard can be turned into cash! The fact that it is of no further value to you doesn't mean it isn't of value to somebody else. There's always a market for used equipment. Reach the greatest number of prospective buyers for the surplus equipment you have, at a minimum cost, thru an advertisement in the—

SEARCHLIGHT SECTION

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Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
General Electric Co.
Westinghouse Air Brake Co.

Anchors, Guy
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Appraisals
American Appraisal Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Cincinnati Car Co.
St. Louis Car Co.
Standard Steel Works
Westinghouse E. & M. Co.

Babbitting Devices
Columbia Machine Works & M. I. Co.

Babbit Metal
National Bearing Metals Corp.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Batteries, Dry
Nichols-Lintern Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
National Bearing Metal Corp.
St. Louis Car Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

Bells and Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Trackwork Co.

Body Material, Haskelite Plymetl
Haskelite Mfg. Corp.

Bodies, Bus
Brill Co., The J. G.
Cummings Car & Coach Co.
St. Louis Car Co.

Boilers
Babcock & Wilcox Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)
Bates Expanded Steel Truss Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.
Taylor Electric Truck Co.

Brake Testers
National Ry. Appliance Co.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Brakes, Magnetic Rail
Cincinnati Car Co.

Brushes, Carbon
General Electric Co
Westinghouse E. & M. Co.

Brushholders
Columbia Machine Works
General Electric Co.

Bulkheads
Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Buses
Cummings Car & Coach Co.
General Electric Co.
Studebaker Corp. of America
Twin Coach Corp.
Yellow Truck & Coach Co.

Bus Lighting
National Ry. Appliance Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
St. Louis Car Co.

Cables (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
General Electric Co.
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Thomas Car Works, Perley A.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.

Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
National Bearing Metals Corp.

Castings, Gray Iron and Steel
American Bridge Co.
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Standard Steel Works

Castings, Malleable & Brass
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskelite Mfg. Corp.

Ceilings Plywood Panels
Haskelite Mfg. Corp.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Change Trays
Cincinnati Car Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners
Oakite Products, Inc.

Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.
Long Mfg. Co.

Coil Banding and Winding Machines
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Changers
Johnson Fare Box Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.
Johnson Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutators or Parts
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condensor Papers
Irvington Varnish & Ins. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Columbia Machine Works
Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.

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Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.

Copper Wire
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebling's Sons Co., John A.
St. Louis Car Co.
Samson Cordage Works

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

Cowl Ventilators
Nichols-Lintern Co.

Cranes, Hoists & Lifts
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Culverts
Central Alloy Steel Corp.

Curtains & Curtain Fixtures
Brill Co., The J. G.
St. Louis Car Co.

Cutting Apparatus
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse Electrical & Mfg. Co.

Dealer's Machinery & Second Hand Equipment
Electric Equipment Co.
Salzberg, Inc., H. E.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.
Safety Car Devices Co.

Doors & Door Fixtures
Brill Co., The J. G.
Cincinnati Car Co.
Hale-Kilburn Co.
St. Louis Car Co.

Doors, Folding Vestibule
National Pneumatic Co.
Safety Car Devices Co.

Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

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Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Ears
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Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Trackwork Co.

Electric Rivet Heaters
American Car & Fdry. Co.

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Amer. Electrical Works.
American Steel & Wire Co.
John A. Roebling's Sons Co.

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Railway Trackwork Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.

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Beeler, John A.
Bibbins, J. Rowland
Day & Zimmermann, Inc.
Falle & Co., E. H.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McClellan & Junkersfeld
McGovern, Halsey
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster Co.
White Eng. Corp., The J. G.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.

Exterior Side Panels
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Johnson Fare Box Co.
Perey Mfg. Co.

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Electric Service Supplies Co.
Johnson Fare Box Co.

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American Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

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Haskelite Mfg. Corp.

Floors
Haskelite Mfg. Corp.

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Cincinnati Car Co.
Standard Steel Works

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

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Electric Service Supplies Co.
General Electric Co.
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Consolidated Car Heating Co.
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General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

(Continued on page 40)

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AND ALL OTHER TYPES

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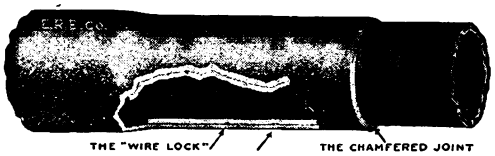

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ANACONDA from mine to consumer

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Efficient Bus Heating

with

The N-L Venti-Duct Heater

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MAGNET WIRE

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Carefully inspected and guaranteed free from flaws.
Samples and information gladly sent.

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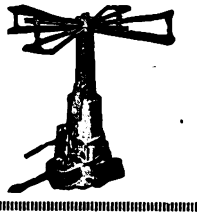

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Cincinnati Car Co.
St. Louis Car Co.

Gear Blanks
Brill Co., The J. G.
Standard Steel Works

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Columbia Machine Works & M. I. Co.
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Westinghouse E. & M. Co.

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Columbia Machine Works & M. I. Co.
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R. D. Nuttall Co.
Tool Steel Gear & Pinion Co.

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Westinghouse E. & M. Co.

Girder Rails
Bethlehem Steel Co.
Lorain Steel Co.

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Greases (See Lubricants)

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Railway Trackwork Co.

Grinders, Portable Electric
Railway Trackwork Co.

Grinding Bricks and Wheels
Railway Trackwork Co.

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Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

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Ohio Brass Co.

Harps, Trolley
Columbia Machine Works
Elec. Service Supplies Co.
National Bearing Metals Corp.
R. D. Nuttall Co.
Star Brass Works

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General Electric Co.
Ohio Brass Co.
St. Louis Car Co.

Headlining
Columbia Machine Works & M. I. Co.
Haskelite Mfg. Corp.

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Nichols-Lintern Co.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Railway Utility Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Heaters, Electric Rivet
American Car & Fdry. Co.

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

Hoists & Lifts
Columbia Machine Works & M. I. Co.

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Traction Brake Co.

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American Steel & Wire Co.
General Electric Co.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

Insulating Silk
Irvington Varnish & Ins. Co.

Insulating Varnishes
Irvington Varnish & Ins. Co.

Insulation (See also Paints)
Electric Ry. Equipment Co.
Elec. Service Supplies Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.

Insulation Slots
Irvington Varnish & Ins. Co.

Insulator Pins
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Insulators (See also Line Materials)
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Interior Side Linings
Haskelite Mfg. Corp.

Jacks (See also Cranes, Hoists and Lifts)
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.

Joints, Rail (See Rail Joints)

Journal Boxes
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Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.

Lamp Guards and Fixtures
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Lamps, Arc & Incandescent (See also Headlights)
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Signal and Marker
Elec. Service Supplies Co.
Nichols-Lintern Co.

Lanterns, Classification
Nichols-Lintern Co.

Letter Boards
Cincinnati Car Co.
Haskelite Mfg. Corp.

Lighting Fixtures, Interior
Electric Service Supplies Co.

Lightning Protection
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Line Material (See also Brackets, Insulators, Wires, etc.)
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Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
National Bearing Metals Corp.
Ohio Brass Co.
Westinghouse E. & M. Co.

Locking Spring Boxes
Wm. Wharton, Jr. & Co.

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Cincinnati Car Co.
Cummings Car & Coach Co.
General Electric Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Lubricating Engineers
Universal Lubricating Co.

Lubricants, Oil and Grease
Universal Lubricating Co.

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Bemis Car Truck Co.

Manganese Steel Guard Rails
Ramapo Ajax Corp.
Wm. Wharton Jr. & Co.

Manganese Steel, Special Track Work
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.

Manganese Steel Switches, Frogs and Crossings
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Meters (See Instruments)

Mirrors, Inside & Outside
Cincinnati Car Co.

Motor Buses (See Buses)

Motors, Electric
General Electric Co.
Westinghouse E. & M. Co.

Motor, Generators & Controls for Electric Buses
General Electric Co.

Motorman's Seats
Brill Co., The J. G.
Cincinnati Car Co.
Elec. Service Supplies Co.
St. Louis Car Co.
Wood Co., Chas. N.

Nuts and Bolts
Bemis Car Truck Co.
Cincinnati Car Co.
Hubbard & Co.

Oils (See Lubricants)

Omnibuses (See Buses)

Oxy-Acetylene (See Cutting Apparatus)

Oxygen
International Oxygen Co.

Packing
Westinghouse Traction Brake Co.

Paints and Varnishes (Insulating)
Elec. Service Supplies Co.
Irvington Varnish & Ins. Co.

Paints & Varnishes, Railway
National Ry. Appliance Co.

Panels, Outside, Inside
Haskelite Mfg. Corp.

Pickup, Trolley Wire
Elec. Service Supplies Co.
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Pinion Pullers
Elec. Service Supplies Co.
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Pinions (See Gears)

Pins, Case Hardened, Wood and Iron
Ohio Brass Co.
Westinghouse Traction Brake Co.

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Standard Steel Works
Westinghouse Tr. Brake Co.

Planers (See Machine Tools)

Plates for Tee Rail Switches
Ramapo Ajax Corp.

Pliers, Rubber Insulated
Elec. Service Supplies Co.

Plywood Roofs, Headlinings, Floors, Interior Panels, Bulkheads, Truss Planks
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Pole Line Hardware
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Hubbard & Co.

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Bates Expanded Steel Truss Co.
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Rail Welding
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Cummings Car & Coach Co.
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Cincinnati Car Co.
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Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Railway Utility Co.
Smith Heater Co., Peter

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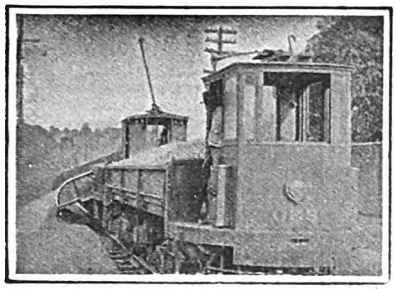

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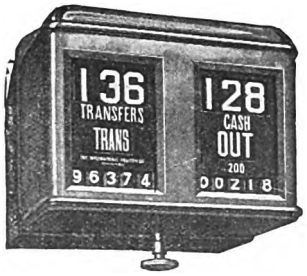

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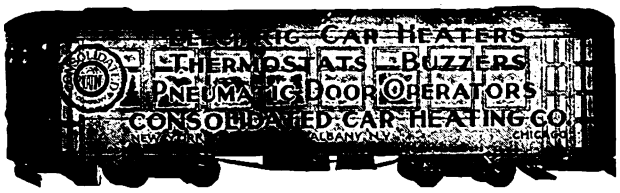

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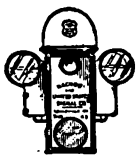

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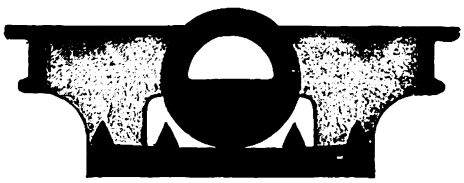

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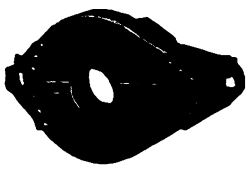

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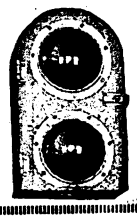

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Haskelite Manufacturing Corporation,
133 West Washington Street, Chicago

PLYMETL SIDE PANELS

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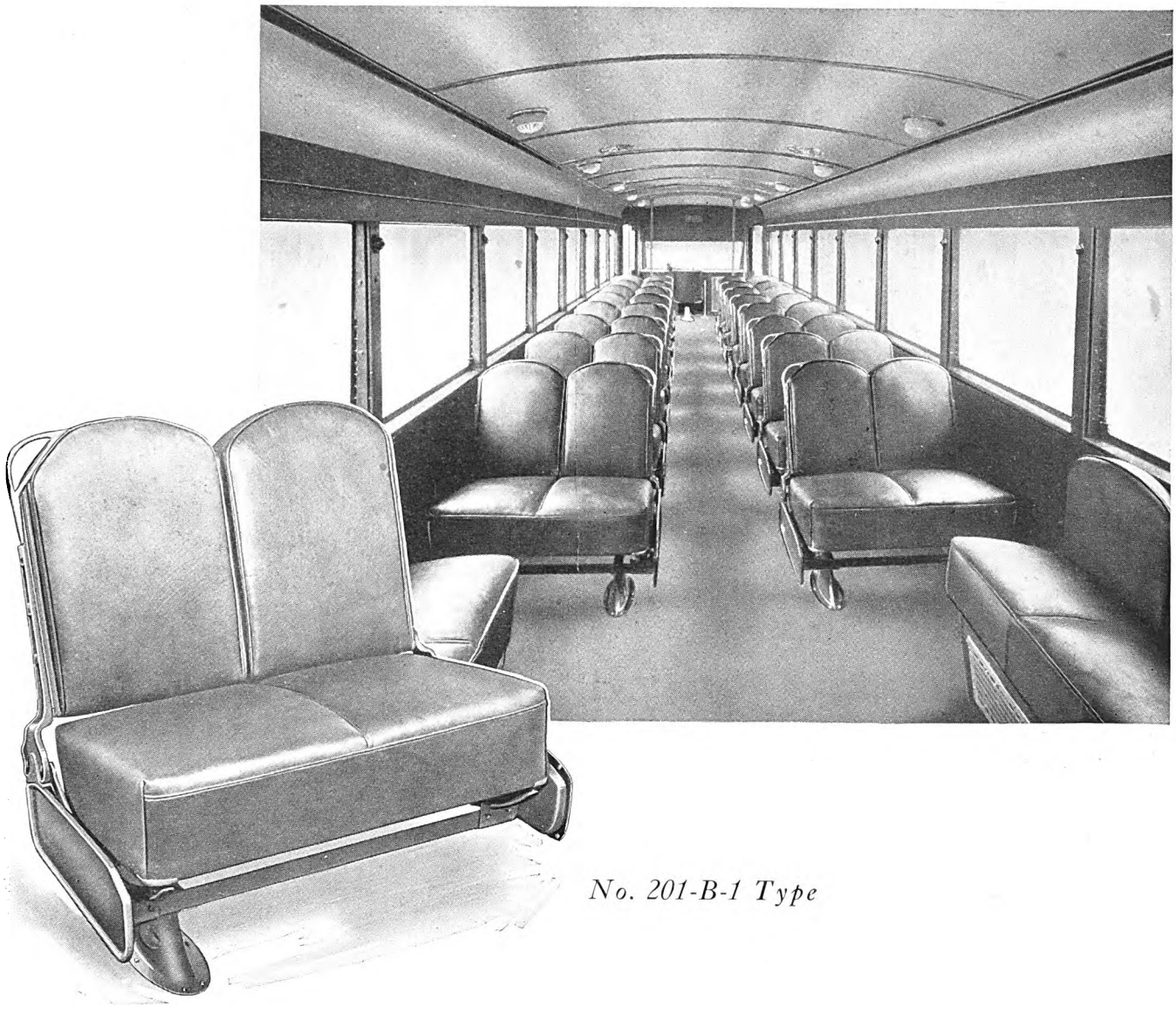

No. 201-B-1 Type

A Seat Worthy of the 1928 Model Car

Throughout the development of its design and influencing the selection of every piece of equipment on the Brill 1928 Model Electric Car was one particular thought—a type of car which would measure up in every way to the demand for a more attractive public conveyance.

Consequently, the Brill No. 201-B-1 was selected to contribute its part in obtaining desired results.

Deep spring leather upholstered cushions, a semi-individual type back pitched back to a most comfortable degree, and a simple yet positive reversing mechanism which suggests minimum maintenance in long and satisfactory service. The Brill No. 201-B-1 Seat is certainly worthy of this latest development in electric cars —the Brill 1928 Model.

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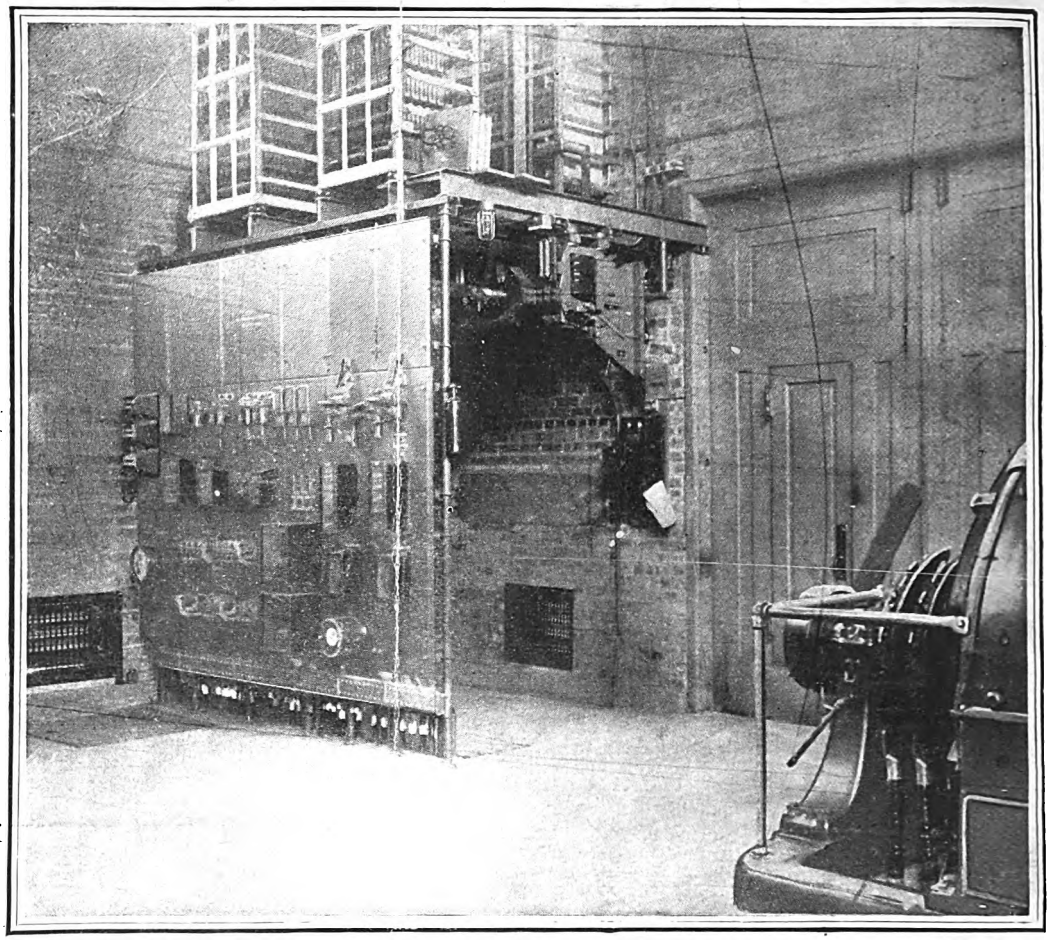

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—built to endure

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The "North Shore's" growing list of automatic substations and its present program of installing automatic equipment in manual stations attest this company's confidence in G-E Automatics.

The G-E Automatic Equipments being built today are still further improved over those that are in regular operation after ten years of continuous service.

Three years before the Chicago, North Shore & Milwaukee adopted automatic control, the first automatic substation (G-E) was put into operation. This station is one of the several G-E Automatics that have been in service 10 years or more.

3-21

GENERAL ELECTRIC

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